

UNIVERSITY FOR DEVELOPMENT STUDIES

TECHNOLOGICAL INNOVATIONS IN ELECTORAL REFORMS IN GHANA'S DEMOCRATIC GOVERNANCE: STAKEHOLDER PERSPECTIVES FROM TAMALE METROPOLIS

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**A THESIS SUBMITTED TO THE DEPARTMENT OF AFRICAN AND
GENERAL STUDIES, FACULTY OF INTEGRATED DEVELOPMENT
STUDIES, UNIVERSITY FOR DEVELOPMENT STUDIES IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF
MASTER OF PHILOSOPHY DEGREE IN DEVELOPMENT STUDIES**

MARCH, 2018

DECLARATION

Student's Declaration

I hereby declare that this thesis is the result of my own original work and that no part of it has been presented for another degree in this University or elsewhere. Other works used in this thesis have been due cited.

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Supervisor's Declaration

I hereby declare that the preparation and presentation of the thesis was supervised in accordance with the guidelines on supervision of thesis laid down by the University for development Studies.

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ABSTRACT

Even though there has been massive deployment of technological innovations in electoral reforms in Ghana's democratic governance processes, elections in Ghana are still bedevilled with a myriad of challenges often resulting in stakeholder agitations after elections. The aim of this study is to assess the use of technological innovations in electoral reforms in Ghana's democratic governance processes especially the perception of the electorate within the Tamale Metropolis. To achieve the set objectives of the study, the mixed methods research approach was adopted. Sampling techniques that were employed during the data collection stage include; cluster, purposive and snowballing. Twenty electoral areas were sampled and from which a sample of four hundred (400) respondents were sampled for the questionnaire interview. In addition, two focus group sessions involving fourteen (14) participants were organised. Data analysis was carried out using SPSS and Excel 2007. However, data from the open questions and focus group were thematically grouped and analysed. Key findings of the study include; the knowledge of the technological innovations the Electoral Commission has been using in electoral reforms, stakeholders embracing the technological innovations, appropriateness of technological innovations, high calibre of temporal staff and the adequate capacity available to the Electoral Commission for the adoption of new technological innovations. The study concluded with a general consensus from the electorate that the deployment of technological innovations has led to improvements in our electoral and governance processes. Some recommendations include increased public education, increased funding for local infrastructure development and improved remuneration of temporal staff to enable the Electoral Commission to continue to conduct free, fair and transparent elections.



ACKNOWLEDGEMENT

I first of all want to give thanks to the Almighty Allah for seeing me through this project. Despite the turbulence I went through in the course of undertaking this study, He remained with me guided me through the entire work. I am most grateful to Him for bringing me this far.

To my supervisor, Dr Frank K. Teng-Zeng (Vice Dean, Faculty of Integrated Development Studies) I want to express my profound gratitude and indebtedness to him for meticulously guiding me right from the selection of an appropriate research topic up to the conclusion of the study. I gain want to thank my supervisor for his patience in explaining the nature of the work I was doing and what to do at every stage of the study. Dr Teng-Zeng, I owe you for invaluable support.

I also owe gratitude to Dr Mohammed Issah of the Faculty of Education of the University for Development Studies for the invaluable contribution he made in guiding me with the analysis of data collected from the field, especially his concern for me to get the study completed so that I can start another programme.

To Dr Mohammed Iddrisu Tanko and Dr Felix Longi, am most grateful for your continuous encouragement. The two of you have constantly put pressure on me to work hard and get the project out. Your continuous reminders have helped me to achieve this goal. To my friends and colleagues of the Electoral Commission, I acknowledge your enormous contribution in getting this work done.



DEDICATION

I dedicate this work to my wife (Sophia Fong-Naah) and children (Ruweida, Rufaida and Fatima Mumuni-Watarah) who sometimes in the course of the study have to miss my company simply because I have to stay long in the office during working days and sometimes at the weekends.

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CHAPTER ONE

INTRODUCTION

1.1. Background to the Study

Many African countries witnessed what some scholars referred to as the ‘third wave’ of democratisation in the early 1990s (Huntington 1991, Young 1996). Students of African politics analysed the ‘regularity, openness, and acceptability of elections’ in these reconstituted democracies that were experiencing both ‘founding’ and ‘second’ elections (Smith, 2002:621), and in some cases now ‘sixth’ and ‘seventh’ elections. Bratton and van de Walle (1997) observed that though epiphenomenal, democratic elections are important component of any country’s consolidation of democracy. Smith (2002) believe that the regularity with which elections are held is necessary to accord legitimacy to a democratic regime. However, they are not a sufficient condition of democratisation.

Smith (2002:622) further observed that because elections are easy to qualitatively assess, there is a danger of placing too much weight on free and fair elections while undervaluing other aspects of democracy such as political tolerance, human rights, civil society, universal enfranchisement, and civil liberties, etc. is easy for scholars to commit.

Globally, countries are now embracing democracy as a system through which social harmony is achieved and therefore taking steps to entrench systems and practices that are democratic. Issues of democracy, elections and good governance have gradually taken centre stage in every political discourse and thereby putting pressure on political leaders. The on-going global recession and rising economic inequality for instance, are exerting pressure on many



democracies, both old and new, to prove to their citizens that they remain relevant to their concerns and wellbeing (Global Commission on Democracy, Elections and Security, 2012: 5).

An American political analyst, Thomas Paine, observed that elections serve as the foundation for the complete development of any democracy and particularly the promotion of the fundamental human rights of citizens. He is said to have stated that, “*the right to vote..... is the primary right by which other rights are protected*” (Documentary on 2004 American Presidential Elections)

The importance of any election related activity in a developing country like Ghana cannot be under-estimated. This position was supported by Okolo (2000) who observed that, the electoral system of any given nation plays a fundamental role in sustaining and moulding the political behaviour of its citizens. Okolo (2000) further stated that the manner in which elections are organised in any country to a large extent determine the level of political culture, political participation and good governance in the country, hence the importance of a good and healthy electoral system.



In Africa and many parts of the developing world, governments or leaders were toppled by mass demonstrations such as happened in the Arab-spring, as a result of bad governance.

However, nations that were inextricably connected with certain ideological or governance systems are all beginning to embrace the virtues of multiparty democracy. In the words of one observer “the political atmosphere in Africa today is radically different; exhilarating, ebullient and optimistic” (Decala, 1992:9). Elections in the opinion of Shils, (1981) have been adopted as part of a modern package no more questioned than economic growth or science and technology.

There is a relationship between elections, democracy and good democratic governance. As a result, by the time any particular country had institutionalised elections, it would have rated high in its governance and democratic indicators. It is therefore valid to observe that the democracy of a country would start to crawl when that country fails at this preliminary stage of conducting free and fair elections.

Elections in Ghana have assumed an important place in the lives of the people even though its administration is not without some challenges. Young (1993:300) pointed out that “a long time ago that there has always been a great deal of electoral behaviour in Africa”. However, it is the quality of these elections being turned out that leaves much to be desired, hence, the need for electoral reforms.

Chiroro (2008:7) observed that “changing electoral systems is no easy task, even in a stable democracy like South Africa”. She posits that electoral system reform movements are usually driven by the fragmentation of a dominant one party system, party alignments, rampant political scandals or serious government failures. Chiroro (2008:7) gave examples of countries

that have in the past few years embarked on electoral reforms as Japan, Italy and New Zealand and added that all these countries prior to their reforms showed “similar symptoms of the failure of their political systems, including political corruption scandals, high degree of public dissatisfaction and doubt regarding accountability and efficacy of the electoral system” (Chiroro, 2008:7).

Within the past few decades several African countries have gone through electoral reforms. Countries such as Ghana, South Africa, Namibia, Mozambique, Nigeria and Lesotho have undertaken electoral reforms due to various reasons. Chiroro, (2008:7), stated that the South African electoral reforms were propelled by three factors, namely; “post- conflict political



settlement; political crisis; and political grievances”. Some reforms were introduced as a way of political settlement after going through violent armed conflicts or when a section of the population feels that the electoral system is not fair or when there is political strife and instability in a country for a very long time.

According to the International Institute for Democracy and Electoral Assistance (IIDEA, 2006), these reforms may enhance the independence of the Election Management Body (EMB) and thus promote better service delivery. IIDEA (2006), further observed that electoral system reforms places a substantial information responsibility on the Elections Management Body, and may require it to implement new methods of electoral boundary delimitation, voting, and vote counting.

Electoral reforms in Ghana are undertaken on a continuous basis, especially before or after major activities like voter registration, voting and post-election evaluation where the effectiveness of certain administration and legal provisions are assessed and reforms are initiated. Different electoral laws have been enacted under different governments over the years, in the form of acts, decrees, constitutional and legislative instruments. Most of these reforms are aided by modern technological innovations. Reforms leading to the 2012 general elections and post-election judicial review as well as preparations towards the 2015 Local Government Elections present a unique character of the management of electoral reforms in Ghana.

The Electoral Commission initiated electoral reforms after the disputed 1992 General Elections with the consent and collaboration of Political Parties and Civil Society Organisations (Gyekye-Jandoh, 2013:89). In introducing these electoral reforms, the Electoral Commission depended on technological innovations, however, to date; there have not been



cessation of complaints from stakeholders. These reforms are aimed at making the electoral process more efficient and effective in delivering free, fair, transparent and incontrovertible elections as its contribution to good democratic governance in Ghana.

The concept of good democratic governance in Ghana like many other parts of the world, does not only occupy a central stage of development discourse, but indeed, is likened to a Development Strategy. Ghana over the past years has designed and implemented various development programmes aimed at opening up and expanding opportunities for citizens. It is clear from the above that, for citizens of any nation to benefit from good democratic governance practices, they must actively participate in the selection processes of their leaders through free, fair, credible and democratic elections.

However, good democratic governance is a little problematic in Africa. The problems associated with the concept calls into question its prescriptions. The donor community lacks a clear basis of arguing the merits of one measurement over the other, or to even evaluate the relative importance of the various components of good governance in any classification. In

Africa, Rwanda has provided an example. As many observers noted, Rwanda has made clear progress in terms of Economic Growth, Public Sector Management and Regulatory Reform since the genocide in 1994. However, its record with respect to Democracy and respect for Civil and Political Rights has been extremely problematic (Mathias and Alioune, 2010). In particular, the use of technological innovations in electoral systems reforms was embraced several years back globally. Technology has always been and is still being utilized in elections; however, recent advances have made its use more widespread and prominent. Over the past twenty five years, Election Management Bodies (EMB's) and lawmakers around the world engaged in electoral reforms incorporate technological innovations in the electoral



process. Kumar and Silas (2004:22), states that, “one important but fairly new and interesting area of technology application is in electoral system reforms”.

However, questions still remain unanswered on the impact of technological innovations in the introduction of Electoral Reforms in Democratic Governance processes. The reasons for some of these questions are that some initial technical glitches often tend to increase tension, thereby raising the question of whether technology has facilitated the introduction of electoral reforms. For instance, with Nigeria’s application of technological innovations in electoral reforms in elections 2010, tension started to mount when the former president, Olusegun Obasanjo had his fingerprints rejected by the Voter Registration System (Kuris, 2012). In the United States of America 2004 elections, there were reported cases of vote switching in Mahoning County in Florida, inadequate Electronic Voting Machines in some states and the freezing of computer servers which raises questions about the legitimacy of the elections and importantly the exact impact of technological innovations (Documentary on 2004 American Presidential Elections).



While the current discourse on electoral reforms and democratic governance in emerging democracies including Ghana highlights and analyses many aspects of the electoral reforms, the focus of this study is to assess technological innovations in electoral reforms and good democratic governance in Ghana and Tamale Metropolis in particular.

1.2. Problem Statement

Elections are a critical variable in the development of democracy, and a good election administration is necessary for democratic stability and social cohesion. As the acclaimed ‘beacon of democracy’ on the African continent, Ghana has experienced much progress in election administration since transitioning to democracy in the early 1990s. However, the

conduct of elections in Ghana continues to face some challenges such as election irregularities despite the introduction of advanced technological innovations. For instance, the results of the 2012 Presidential Election were contested in court by the opposition New Patriotic Party (NPP) based on allegations of irregularities coming on the heels of the compilation of a Biometric Voter's Register and the use of Biometric Verification Device for the verification of voters during the elections (CDD, 2013).

The Electoral processes involved in Ghana's Electoral System in the lead up to and the main elections should be home run activities at this point in Ghana's history. After all, per Huntington's two-turnover test, Ghana has achieved democratic consolidation and all political actors seem to be willing to play by democratic rules. With successive elections promising to test how deep Ghana's supposed consolidated democracy is, with this come the promise usage of new digital technologies and the possibility of it's impacting the elections in both positive and negative ways.

As a contribution towards this democratic consolidation through the delivery of better elections, the Electoral Commission has over the years introduced electoral reforms which heavily relied on technological innovations. In particular, the recent introduction of the Biometric Voter Registration (BVR) and Verification, the Elections Results Management System (ERMS) a system for the transmission of elections results to the Head office for collation using electronic equipment among others can be mentioned. However, with the introduction of all these technological innovations, the Electoral Commission continued to encounter challenges, and the key question that then arose is whether technological innovations have successfully facilitated the introduction of electoral reforms Ghana's democratic governance processes, hence the gap this study intend to fill.



Various studies abound as to why the application of technological innovations either succeed or fail in different organisations. In a study by Jones (2004), he attributed the ineffective use of Information and Communication Technology (ICT) to lack of confidence among workers, poor access to resources, insufficient time for ICT integration, ineffective training, technical problems as well as the age of workers.

In a similar fashion, Snoeyink and Ertmer (2002) identify some challenges confronting the application of ICT in organisations to include lack of quality software, the general attitude towards computers and resistance to change, poor administrative support, lack of computer skills as well as lack of vision as to how to integrate ICT in the organisation. Other studies rather emphasized on the need to find a close fit between the management of ICT and complementary resources such as strategy, the organizational structure, human resources and organizational resources (Walton, 1989, Belanger, 1998).


Studies such as the Technology-Organisation-Environment framework on the application of technological innovations point to three main areas worth considering when it comes to the adoption and use; namely, the organisation, the people or stakeholders and the technology itself (Tornatzky and Fleischer 1991) With regards to the organisation, the questions that should be addressed are whether the organisation has the requisite manpower and technical competence to handle the implementation process. The second important consideration is whether the technology is simple and can be easily adopted by the people and finally whether the technology that is chosen is appropriate given the characteristics of the target population and the current status of the implementing organisation. It is also clear; the above study was carried out from different perspectives and mostly qualitative research. However, none did take place within the context of election administration, particularly with the introduction of



electoral reforms and promotion of democratic governance in Ghana using the mixed methods research.

In Ghana, over the past two decades, a number of elections have been held and there has always been changes introduced to the Electoral Process after each election as a result of complaints from various stakeholders and a self-introspection that the Electoral Commission normally undertake on how it conducted the exercise. These changes are always accompanied by technological innovations. However, after the application of each technological innovation in these reforms, stakeholder dissatisfaction and agitation still persists which means there is a problem. Additionally, no research has so far been undertaken to assess the role of technological innovations in the introduction of electoral reforms in Ghana. *Thus, the problem that engages the attention of this research is to assess the role of technology in promoting Electoral Reforms and Good Democratic Governance in Ghana in general and within the Tamale Metropolis in particular.*

1.3. Research Questions

 Given, the above discussion, what is clear is that, despite the adoption of technological innovations in the introduction of electoral reforms in Ghana, election administration is still bedeviled with some challenges which pose a serious threat to Ghana's attempt at consolidating democratic governance system. As a result of these challenges, one main question and five specific questions have been formulated by the study to address the problem identified.

1.3.1. Main Research Question

The main research question this study intends to address is “*what is the role of technology in promoting electoral reforms and good democratic governance in Ghana*”

1.3.2. Specific Research Questions

The specific research questions that have been formulated to address the main research question include the following;

1. What is the technological trajectory in electoral reforms in Ghana?
2. What is the calibre of human resource involved in the use of Technology in electoral reforms in Tamale metropolis in particular and Ghana as a whole?
3. Do stakeholders embrace the technology used for the elections?
4. How appropriate is the technology used in the reforms?
5. Has Electoral Commission the capacity to adopt and implement electoral reforms with technology?

1.4. Main Research Objective

The main research objective is to assess the role of technological innovations in promoting electoral reforms and good democratic governance in Ghana.

1.4.1. Specific Research Objective

The specific research objectives are to:

1. Trace the technological trajectory in electoral reforms in Ghana.
2. Assess the calibre of human resource involved in the use of technology in electoral reforms and good governance in Tamale Metropolis in particular and in Ghana as a whole.
3. Determine whether stakeholders embrace the technology used for the elections
4. Assess the appropriateness of the technology used in the reforms.



5. Assess the Electoral Commission's capacity to adopt and implement electoral reforms with technology.

1.5. Significance of the Study

The study admits first and foremost that, there is a large volume of literature out there on the thematic areas of the topic thus; elections, electoral reforms, democracy, good governance and technology as general subject areas. It is however significant to note that, very little literature exist on how to assess the role that technology plays in efforts by various Election Management Body's around the world that are embarking on electoral reforms.

Significantly, one can argue that the application of technological innovations in the introduction of electoral reforms and the promotion of democratic governance processes which has cost various nations billions of United States Dollars have not yielded maximum benefits. However, this study plays an important role in establishing the extent to which technological innovations has advanced the introduction of electoral reforms as a contribution towards ensuring good democratic governance which can help foster the implementation of pro-poor policies and programmes.

The research area which revolves around electoral reforms, technology and good governance in Ghana is an area that is fairly new to researchers. This research contributes to assessment technological innovations in electoral reforms in Ghana's democratic governance.

It is crucial to theory because, a review of the literature so far has not unearthed any similar study; hence findings of the study could be applied in the modification of theory of technology-organisation-environment which mainly guided the work. Most importantly, the



study will bring out clearly the kind of contribution technological innovations have made over the years towards the introduction of electoral reforms and democratic governance in Ghana.

The analyses of the study are also intended to provide guidance on how to improve the adoption of technological innovations in electoral reforms democratic governance process. It will also help to understand the real value of technological innovations in electoral reforms and the deepening of democratic governance in Ghana as a whole and Tamale Metropolis in particular. Finally, the study is relevant since it will help to identify some of the challenges that negatively impacted on the adoption and use of technological innovations in election administration in Ghana (especially the role of election officials) and make recommendations to the Electoral Commission on how to address these challenges.

1.6. Scope of the Study

The focus of this study is an assessment of the application of technological innovations in the introduction of electoral reforms in Ghana. From this viewpoint technology use would be concentrated on the electoral process where the electorates who are the direct beneficiaries of the outcome of electoral activities have a direct contact. As such, the use of technological innovations in the entire core areas of elections would constitutes the main focus of the study.

Issues such as the appropriateness of the technology, thus whether it is user friendly and also whether the stakeholders have embraced it will come under scrutiny.

1.7. Limitation of the Study

The study comes under two most important limitations of constraints of time and resources. It is difficult to mobilise the financial and logistical requirement for a larger sample size for the study. As a result, it is very unlikely that the study would have access to all the categories of stakeholders in the electoral process within the Tamale Metropolis and its environs to



interview for the study. Interpreting questionnaires into the local languages also poses another limitation to the study. For most of the questionnaires would not be self-administered but would require a research assistant to interview respondents. As a result, getting the exact words that carries the same meaning as words used in the questionnaire poses limitation.

1.8. Organisation of the Study

The study is carried out in five chapters. Chapter One deals with a general introduction gives background to the study thus a brief review of literature on governance, elections, electoral reforms and technology; statement of the problem; main and specific research questions and objectives; scope of the study; significance of the study and the organisation of the study. Chapter Two starts with a theoretical framework that will guide the analysis of the study. The chapter is more of an analysis of the research area and review of the definition of key concepts and related issues in the literature. In brief, the chapter contributes to a better understanding of the discussion pertaining to the topic as well as tracing the trajectory of technology use in electoral reforms in Ghana. Chapter Three, deals with a description of the study area as well as the methodology that is employed in the collection and analysis of data. Chapter Four entails the presentation and discussion of findings from the field data and other relevant information that was gathered during the study. Finally, Chapter Five, contain a summary of the study as well as useful recommendations made based on the research findings. The next chapter is chapter two; this chapter will present the literature review



CHAPTER TWO

LITERATURE REVIEW

2.0. Introduction

This chapter consist of a Conceptual Issues and Theoretical Frameworks under which the study is subsumed and a review of literature. Literature review in any study is very significant, since it outlines the broader parameters of the study. In the view of Oquaye (2004), a very close look at it reveals that literature review captures a cross section of perspectives on the subject matter which conceptualises the research topic. Oquaye (2004) believes that, it is based on the forgoing arguments that some thematic areas are selected and addressed under the literature.

The key concepts and thematic areas covered by the literature include; definition of key concepts such as Technology, Innovation, Good Governance, Democratic Governance, Electoral Reforms, Electoral Systems, Democracy and Stakeholders as well as debates and explanation of these concepts from different perspectives, the theoretical framework.



2.1. Definitions and Explanations of Conceptual Issues

The definitions and explanations below show how these concepts are distinct and how some of their features can be shared. The need for clarity in the definition of concepts goes beyond the academic aspect of the study, but could provide a clear guidance in the formulation of policies if the research report is to play any future role. The concepts that are used in this study are explained as follows:

2.1.1. Technology

One important but fairly new and interesting area of technology application is in electoral reforms. Technology is defined as the application of science for easing the functional life, making it both efficient and productive (Kumar and Silas, 2004:22). In the view of Laanela (2001:2) ‘technology is anything involving the application of science and engineering’. This definition is too broad and could cover any manufactured item. According to Orlikowski (1994:403) “technology is material artifacts (various configurations of hardware and software)”. However, Rogers (1993:12) defined technology as ‘design for instrumental action that reduces the uncertainty in the cause-effect relationship involved in achieving a desired outcome’. In the view of Rogers, technology usually has two components; the hardware aspect, which consist of the tool that embodies the technology as the material or physical objects and; the software aspect which consist of information base for the tool. The study deems this definition more appropriate to guide its analysis.

2.1.2. Innovation

Like many other concepts, the term innovation has been defined differently by various authors. However, this study considers the definition provided by Rogers (1993) more appropriate for its analysis. According to Rogers (1993:11), ‘an innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption’. The term may also entail attempts at changing something established by the introduction of new methods, ideas or products.

Rogers (1993:11) posits that, in as much as human behavior is concern, little attention is paid to ‘whether or not an idea is “objectively” new as measured by the lapse of time since its first use or discovery’. Rogers further observed that, perceived newness of an idea for the



individual determines his or her reaction to it. Thus ideas that seem new are considered as innovations. Technological Innovations embodies information and thus reduces uncertainty about cause-effect relationship in problem solving.

2.1.3. Democracy and Elections

The concept of democracy is traceable to the ancient Greeks and specially the city-state of Athens in the fifth century B.C. The word democracy is derived from the Greek word '*demos*', meaning people, and '*kratos*' meaning power or rule (Konrad Adenauer Stiftung, 2007). The problem with democracy has been its very popularity, a popularity that has threatened the term undoing as a meaningful political concept. In being almost universally regarded as a 'good thing', democracy has come to be used as a little more than a 'hurray! Word', implying approval of a particular set of ideas or system of rule. In the words Crick (1993), democracy is perhaps the most promiscuous word in the world of public affairs. A term that can mean anything to anyone is in danger of meaning nothing at all. Some of the meanings that have been associated with democracy are;



- A system of rule by the poor and disadvantage;
- A form of government in which the people rule themselves directly and continuously, without the need for professional politicians or public officials;
- A system of decision-making based on the principle of majority rule;
- A means of filling public offices through a competitive struggle for popular votes (Konrad Adenauer Stiftung, 2007).


This study defines democracy as a form of government in which power and civic responsibility are exercised by adult citizens, directly or indirectly through freely elected representatives

Democracy is a very complex concept and scholars are quick to associate it with elections. In the view of Hoffman (1988), it is the most discussed and contested notion of political theory. Wiseman (1990) stated that many governments of quite different types wish to describe themselves as democratic. The problem with democracy however, has been its popularity. This popularity has threatened its importance as a meaningful political concept. Given its universal acceptance as a “good thing”, Crick (1993), stated that democracy is perhaps the most promiscuous word in the world of public affairs. The danger this state of affairs posed to the concept is that, a term that can mean anything to anyone is in danger of meaning nothing at all.

Allence (2009:5) argued that “two decades of hindsight offer an empirical basis for greater optimism about the durability and performance of democracy in Africa”. He posits that the wave of democratization in the region is partial and potentially reversible, and skeptics have identified important vulnerabilities. Yet Africa’s democracies have lasted longer and performed better than initially expected. Allence (2009) concluded his optimism of democratic development on the African continent when he cited the Ghana’s 2008 presidential election in which the opposition party candidate won a run-off by a razor-thin margin of thirty thousand votes, out of the over nine million (9,000,000) votes cast. It marked the second time power had changed hands constitutionally since the country’s 1992 democratic transition. Ghana thus became the largest African country ever to pass the “two-turnover test” of democratic consolidation. This achievement according to Allence (2009) was widely reported and praised throughout the region, clearly demonstrating the possibilities of democratic practice in Africa.

Democracy goes beyond the opportunity for free and fair elections. Although sight must not be lost of its centrality in any democratic process, the point must be made that democracy is not wholly centred on elections even though the key elements in the exercise of many democracies is the holding of free and fair elections at regular intervals enabling the people's will to be expressed. Additionally, in the liberal democracy, the electoral space is open, and the playing field is reasonably level.

The general observation that can be deduced from existing literature on the democratisation process in Ghana to date is that, the process has been critical in the re-orientation of the Ghanaian Political System away from Dictatorships and Authoritarian regimes such as those experienced in the 1970s and 1980s towards multiparty democratic governance. This kind of trend in the view of Matlosa (2006) has been critical in terms of progressively shifting politics from that based on personality cults towards politics predicated upon institutions since largely, the former often leads to poor leadership through either a one-party or one-person rule in most states on the continent. This has largely been the trend in Ghana in most parts of the 1970s and 1980s where military dictatorships were the order of the day.




Diamond (1999) stated that, the maximalist definition of democracy is holistic as it incorporate not only a civilian constitutional multiparty regime, with regular free and fair elections and universal adult suffrage, but organisational and informational pluralism; extensive civil liberties (freedom of expression, freedom of the press as well as freedom to join and form organisations); effective power for elected officials; and functional autonomy for the legislature, executive and judicial organs of government.

Budeli and Mangu (2008) oppose this view expressed by proponents of the maximalist theories of democracy by emphasising that individual and civil rights are not simply

“bourgeois” concepts, arguing that they also matter in a democracy. They added that democracy should not stop at forms and institutions, but it must include individual and collective rights as well as social and economic rights since all human rights are interdependent and interrelated. On his part, Dahl (2001) posits that there are certain conditions which make it easier to maintain democracy in a given country. He identifies them to include an effective control by the elected leaders over the military and police, a political culture of democratic beliefs, and a relatively well-functioning economic order among others.

Elections, some scholars argue, play a very crucial role in facilitating the efforts of countries that are transitioning from authoritarian regimes to democracies. Pastor (1999) has elaborated the very significant impact of election administration on transitional and subsequent elections. He observed that, election administration is the thin line that separates success from failure of democratic transitions and that the character, competence and composition of an Election Management Body can determine whether an election is a source of peaceful change or cause of serious instability.



Princeton (2005) argued that elections and democracy are inextricably linked. He stated that whatever else is essential to make democracy effective and sustainable, elections are the lifeblood of the system, the constant affirmation of legitimacy for its leaders and the bond that links those leaders with their people. In his view, he believes that, elections only become meaningful to people within the context of a democracy. Elections and democracy have become virtually synonymous in every political thought and analysis especially when issues of good democratic governance are discussed.

Undoubtedly, elections play a critical role in the nurturing and consolidation of democratic governance in Africa as a whole and sub-Saharan Africa in particular (Matlosa, 2003). This is

because elections allow citizens the use of their own choices and voices to appoint both local and national leaders to run the affairs of state on their behalf. According to Kitschelt, (2000), the conduct of free and fair elections is at the heart of the democratic process. Elections therefore serve as the institutional mechanism within a democracy to induce responsiveness among rulers and also to ensure that these same rulers are held accountable for their actions.

Ghana, like other African countries, places a high premium on elections and democratic good governance. It is crucial to revisit the concept of democracy and its relationship with elections and to try to find out if the regular holding of elections with the application of technological innovations has always led to democratic good governance.

Carothers (2002) argues that Ghana can be seen as the only African country with significant democratic progress which has kept up its positive engagement for sustainable democratization. Ghana has reached quite reliable political democratic stability. Supporting this position, Crawford (2004b:3) states that;

“The Ghana case provides a particularly good test for European Union democracy promotion efforts, and those of International Actors generally. Given the favourable context, and demand for, democracy assistance, if the reality of democracy promotion does not live up to policy rhetoric in Ghana, then it unlikely to do so elsewhere in Africa”.

Riker (1998:8) stated that “democrats of all persuasions would probably agree that participation built on the act of voting is the focus of democracy”. Elections, it is therefore argued, are the cornerstone of representative democracy. Through elections, governments obtain their democratic mandate and are held accountable for their performance in office. Flawed elections however, deprived people of their voice in governance and undermine

sustainable democratic development. Lindberg (2006) has shown that even when elections leaves a lot to desire in terms of free and fairness, the process of repeated, competitive elections tends to generate a momentum for greater democratization. Using the mixed methods research, the study intends to assess the impact of technological innovations in electoral reforms and good democratic governance in Ghana.

2.1.4. Good Democratic Governance

Defining good governance has become a contentious issue in development co-operation circles and has led to a multiplication of conflicting concepts. Good governance is a process that, in the words of international regimes theory, represents a persistent and connected set of rules, formal and informal, that prescribe behavioural roles, constraints activity, and shape expectations (Keohane, 1998). Krasner (1982) defines good governance as a governing regime, thus a set of institutional norms, rules and decisions-making procedures that frame that frame the process of government.

This study extends good governance beyond the capacity of public sector management to the rules and institutions which create a legitimate, inclusive, transparent and accountable framework for the formulation and conduct of public policy. It defines good governance to include managing public affairs in a transparent, accountable, participatory and equitable manner showing due regard for democratic principles and rule of law. The definition focuses on political norms defining political action, the institutional framework in which the policy-making process takes place and the mechanisms and processes by which power is exercised.

Democratic governance is the range of processes through which a society reaches consensus on and implements regulations, human rights, laws, policies and social structures in pursuit of justice, welfare and environmental protection. In a democratic governance system, policies



and laws are carried out by institutions such as the legislature, judiciary, the executive branch, political parties, private sector and a variety of civil society. In this sense democratic governance brings to the fore the question of how a society organises itself to ensure equality of opportunity and equity in social and economic justice for all citizens.

Like its bed fellow democracy, the concept of good governance is highly contested by scholars resulting in varying interpretations of what should constitute good governance. In the view of Antwi-Danso (2013:1), “governance has just become associated with its normative partner “good”, but it is also highly politicised. He observed that the parameters for measuring good governance are mixed and difficult to universalise and that often times is equated with democracy. Antwi-Danso observed that “beyond what has been described here as offering democracy, good governance must involve good visionary leadership, institutionalism, and prudence in economic management including provision of basic needs of people-driving down poverty, probity and accountability; dialogue; transparency and inclusiveness; and adherence to global best practices” (Antwi-Danso, 2013:1).



There is an interconnection between good governance, human rights and the provision of sustainable development. This interconnection according to Bemile and Boateng (2011) has been made directly or indirectly by the International Community in a number of declarations and other global conference documents. They cited for instance, that the declaration on the Right to Development proclaims that every human being and all people are entitle to participate in, and contribute to, and enjoy economic, social, cultural and political development (Article, 1).

The forgoing discourse has shown that for good governance to triumph in any nation, some facilitating conditions such as a robust and dynamic economy, a vibrant civil society and an

informed and empowered citizenry must be present. Kiyaga (2007) posited that, the elements identified with good governance tend to reinforce each other in creating the right conditions for successful local development. The adherence to constitutionalism and rule of law will create checks and balances, reduce excesses and abuse of office and also create an environment that is conducive for investment and economic growth. Whereas the elements of justice and equity embedded in good governance creates the opportunity for equal treatment of people whilst ensuring the even-handed distribution of resources, good leadership generates better pro-poor policies and improves performance. Ensuring popular participation of all people in the decision-making process would result in better prioritisation and strengthen local ownership of development programmes. And finally, transparency and accountability in public office ensures that resources reach the targets for which they are intended and also an informed and empowered citizenry would help hold public officials to account by ensuring that policies that are pursued are a reflection of the general will of the people. According to Gisselquist (2012) the former UN Secretary-General, Kofi Annan, stated that good governance is perhaps the single most important factor in eradicating poverty and promoting development.



2.1.5. Electoral Reforms

There is little agreement among scholars about the definite meaning of electoral reforms due largely to the nature of elections, which sometimes exude controversies, tensions and uncertainties (Debrah, 2015). Despite the absence of a general agreement on what constitute electoral reforms; Lijphart (1994:51) observed that the most commonly used definition by researchers is the one that defines electoral reform as a “wholesale replacement of the electoral formulae of national electoral systems”. This means that reforms in the electoral

process could be detailed and covers such areas as the formula for the distribution of seat in parliament, for example a shift from the use of Proportional Representation (PR) to the Majoritarian or First Past the Post (FPTP) and other forms of voting calculation.

Even though electoral reform has for a long time being conceived along Lijphart model, this study considered the definition provided by International Institute for Democracy and Electoral Assistance (IIDEA) more appropriate in guiding its analysis. According to IIDEA (2006), electoral reform is the improvement of the responsiveness of an electoral process to the desires and expectations of the electorate. It is a reform when the change is intended to foster and enhance impartiality, inclusiveness, transparency, integrity or accuracy of the electoral process. The study considers this definition more appropriate to guide its analysis.

2.1.6. Electoral System

Electoral System, which determines exactly how citizens can make their preferences known, varies widely around the world. All elections are governed by rules that determine who becomes a candidate and how votes are translated into seats in the parliaments of various democracies. Various definitions have been offered. Venter (2006) defines electoral system as the rules and procedures by which votes are translated into seats in parliament or the selection of political representatives. They are critically important for promoting democratisation because they are highly manipulative instruments of “constitutional engineering”. Venter’s definition offers a good platform on which this study is analyzed.

The electoral system in Ghana is Plurality Majority System (First Past The Post) characterised by a Two Round System for the election of the president. A winning presidential candidate must secure 50 percent plus one vote, failure to which a presidential run-off is held within twenty one days after the first round. Members of parliament are elected through the first past



the post constituency based electoral system. The election of members of parliament is conducted simultaneously with the election of the president.

The fundamental principles underlying Ghana's electoral system is for every adult citizen to participate in the election of his or her representatives. Consequently, the Electoral Commission has a unique place in the democratic development of Ghana as it enables citizens to execute their rights. The basic characteristics of Ghana's electoral system are;



- Universal adult suffrage for citizens;
- Official registration of voters;
- Non-compulsory registration or voting;
- Secret ballot;
- Use of identity cards issued by the Electoral Commission to establish voter's identity and to prevent impersonation;
- Registration of Political Parties as corporate bodies;
- Political Parties are not allowed to sponsor candidates for elections to District Assemblies and Lower Government Units;
- Local and National Elections alternate at two year intervals;
- Presidential elections where a winner requires more than fifty percent (50%) of valid votes cast;
- Parliamentary and Local Elections on the basis of first past the post;
- A run-off election in case no winner emerges on the first ballot;
- No minimum turnout required for presidential and parliamentary elections;
- Use of indelible ink (electoral stain) to prevent multiple voting and;

- A permanent Electoral Commission (Venter, 2006).

2.1.7. Stakeholder

Bryson's (2004) definition of stakeholder from both a scientific and policy viewpoints presents a variety of ways of defining stakeholders with emphasis on four main features. The first, Bryson (2004) identifies stakeholders as individuals or groups who are affected directly either positively or negatively by a decision or consequence of a decision. According to Bryson (2004), the second category are those who have the ability either directly or indirectly to influence a decision or consequence of a decision. The third definition identifies stakeholders in relation to a situation or a specific issue such as elections. Bryson (2004) give the fourth feature of stakeholders as those with legitimate concerns or interest in certain issues or decisions, such as the distribution of resources, benefits or losses or inputs.

Bryson (2004) revising his earlier definition of stakeholder stated that 'it is any group or organisation that can place a claim on the organisations' attention, resources, or output, or is affected by that output'. On his part, Freeman (1984:46) defined stakeholder as 'any group or individual who can affect or is affected by the achievement of an organisational objectives'.

Ninsin (2006) defines stakeholders as those individuals and groups who depend on the organisation to fulfill their own goals and on whom in turn; the organisation depends for legitimacy. The study adopts the definition provided by Bryson (2004) to guide its analysis.

However, it is important to note that within the Ghana's electoral system there are different stakeholders including government, political parties, electorate, candidates, media, and judiciary that are briefly discussed below.



2.1.7.1. The Government

Successful adoption and implementation of electoral reforms depends largely on the kind of relations the Election Management Body has with the Executive Arm of government. In the case of Ghana where the operations of the Electoral Commission are funded from the Consolidated Fund, the Electoral Commission has a tall order in establishing a cordial relation that can be exploited for the timely release of funds for its operations. In particular, the procurement of technological innovations which comes with huge capital outlay and this may depend on the ability of the government to finance such innovations and keep them up to standard given the speed of technological development.

2.1.7.2. Political Parties and Candidates

Given the importance attached to electoral reform activities, effective engagement with stakeholders is very crucial. Political Parties and Candidates are key stakeholders whose concerns and interest the Electoral Commission have to consider when designing and implementing reform policies and activities. The International Institute for Democracy and

Electoral Assistance (2006) argues that, unless the Election Management Body enjoys a good relationship with, and the confidence of Political Parties, its policies and programmes will attract criticism that will make it difficult for it to enjoy widespread support.

Therefore maintaining an open-door policy to stakeholders when it comes to the implementation of electoral reforms to a large extent determines the level of acceptability of those reforms. Regular engagement with political parties and candidates to elections on determining the types of reform policies and programmes, especially, when it comes to the application of technological innovations in the implementation of the reforms can provide a framework for reciprocal communications and also promotes the acceptability of Electoral



Commission's processes and outcomes of its activities. Within the Ghana's electoral system, major stakeholders are discussed below.

2.1.7.3. The Electorate

The confidence of the electorate in elections is very critical, since that has an effect on the legitimacy of elected officials, support for government policies and institutions and the quality of democratic representation in the country. In Ghana's electoral process, the electorate is considered very crucial. As a way of getting them properly involved, the Electoral Commission, before rolling out any programme often design appropriate voter education materials to provide the necessary guidelines to the electorate.

2.1.7.4. The Media

Media organisations and practitioners are important stakeholders in the electoral process. According to IIDEA, (2006), the media print and electronic, public and private, can be a key ally of the Elections Management Body in informing the public about its mandate and operations as well as informing and educating voters about democracy and elections.

Described as Forth Estate of Realm, the media is always the first point where many other stakeholders find comfort in expressing their impressions about the electoral process and governance in general.

2.1.7.5. Election Officials: Both Permanent and Temporal

For the effective and successful implementation of electoral reforms, the greatest asset at the disposal of Elections Management Body is its human resources. The human resources of the Electoral Commission comprise both its permanent and temporal staff as well as those hired on contract basis. Unless an Electoral Commission safeguards the interests of its staff and responds appropriately to their concerns, it stands the risks of failing to deliver successful



elections or formulate and introduce electoral reforms. Hostile staff be it permanent or temporal that may not adhere to the core values and principles of the Electoral Commission may frustrate its programmes.

2.1.7.6. Domestic and International Monitors and Observers

Election Monitors have the power to intervene and rectify shortcomings in the electoral process whereas Observers whether domestic or international, do not have such powers but can only report on what has transpired at the polls. Their role then becomes critical in the electoral process particularly with the introduction of reforms. It is therefore crucial for the Electoral Commission to create and sustain a good relationship with both Election Monitors and Observers.

2.1.7.7. Donor Community and Electoral Assistance Agencies

Donor funding has played and continue to play important role in building democracies and electoral systems around the world. This therefore makes the Donor Community and Electoral Assistance Agencies an indispensable partner of many Election Management Bodies across the world. The International Donor community may channel resources either directly to the Election Management Body or through an intermediary such as a Sector Ministry to finance the introduction of electoral reforms through activities such as the procurement of appropriate technological innovations needed for the reforms.

2.1.7.8. Civil Society

Over the years, the Ghanaian Civil Society has become an important stakeholder in election administration especially when it comes to calls for electoral reforms. In particular, Civil Society Organisations in Ghana have become increasingly vocal in its demand for an end to mounting political tension and escalating violence prior to elections (CDD-Ghana, 2008).



Think Tanks, Advocacy Groups, Religious and Professional Organisations, and Non-Governmental Organisations (NGOs) comprised an impressive platform of independent coverage of the electoral process assisted by advanced technological innovations meant for regular updates of local and regional results, Parallel Vote Tabulation via mobile phone text messages and local radio stations have been playing crucial roles in the Ghana's electoral reform processes (Gyimah-Boadi, 2009).

2.1.7.9. The Judiciary and Security

Activities of the Electoral Commission are guided by legal framework. It is the judicial arm of the State together with the Security Agencies that provides the right platform for the Electoral Commission to secure the legal authority for its operations and also get issues of electoral fraud properly investigated and prosecuted. The Commission and its members of staff may be subject of judicial investigation or civil litigation or its administrative policies and practices may be subjected to challenges in tribunals. As a result, it is extremely important that the Electoral Commission is professional, accessible and cooperative in its dealings with the wider judicial and security system. Despite the role performed by the other stakeholders discussed, the main focus of this study is the electorate.

2.2. Theoretical Framework


Theoretical framework can be thought of as a map or travel plan (Sinclair, 2007). At the start of any research study, it is important to consider relevant theory underpinning the knowledge base of the phenomenon to be researched. Nachmias and Nachmias (1996) defined theoretical framework as a representation of reality; it delineates variable of the real world the scientist considers to be relevant to the problem investigated and makes implicit the significant relationship among these variables.



The study therefore, is guided by the following two theories been used in the organisation study of Information Technology adoption. These include: Diffusion of Innovation (DOI) and Technology-Organisation-Environment (TOE) framework. The combination of two or more theoretical models have promoted a better understanding of technological innovations compared with using one theoretical model for the same study (Salimonu, Wan, Osman, Shittu & Jimoh, 2013). The choice of these models is based on the fact that the Electoral Commission of Ghana serves as a focal point for this study, having used technological innovations for the introduction of electoral reforms. Each of these two theories is discussed as follows:

2.2.1. Diffusion of Innovation (DOI)

The Diffusions of Innovations (DOI) theory has received a wider support in Information Technology adoption research. This theory described the introduction of innovations as being communicated through particular cannels over a period and within certain social system (Salimonu, et al, 2013).

 According to Salimonu, et al, (2013) the diffusion innovation theory puts forward the following three independent variables:

2.2.1.1. Individual (Leader) Characteristics:

This describes a construct attitude of the individual towards change. It also describes the attitude of individual or leader to the introduction of IT innovation in an organisation.

2.2.1.2 Internal Characteristics of an Organisation:

This second independent variable has six constructs, which are:



- **Centralisation:** This describes the degree to which power and control is put in the hand of an individual relative to others in the organisation, it has a negative influence on the organisational innovations.
- **Complexity:** This is the degree to which members of an organisation have high level of knowledge, expertise, specialties, and formal training. Complexity is positively associated with organisational innovativeness.
- **Formalisation:** This is the extent to which rules and procedures govern the roles of members of the organisation.
- **Interconnectedness:** This is the extent to which units in the organisation are connected by interpersonal network for the exchange of new ideas or knowledge among members of the organisation. It is positively related to the organisational innovativeness.
- **Organisational Slack:** This is the degree to which additional resources are made available to the organisation. It has a positive association with the organisational innovativeness.
- **Size:** This is positively related to the organisational innovativeness. A large organisation tends to be more innovative when compared with small organisation.

2.2.1.3 External Characteristics of the Organisation:

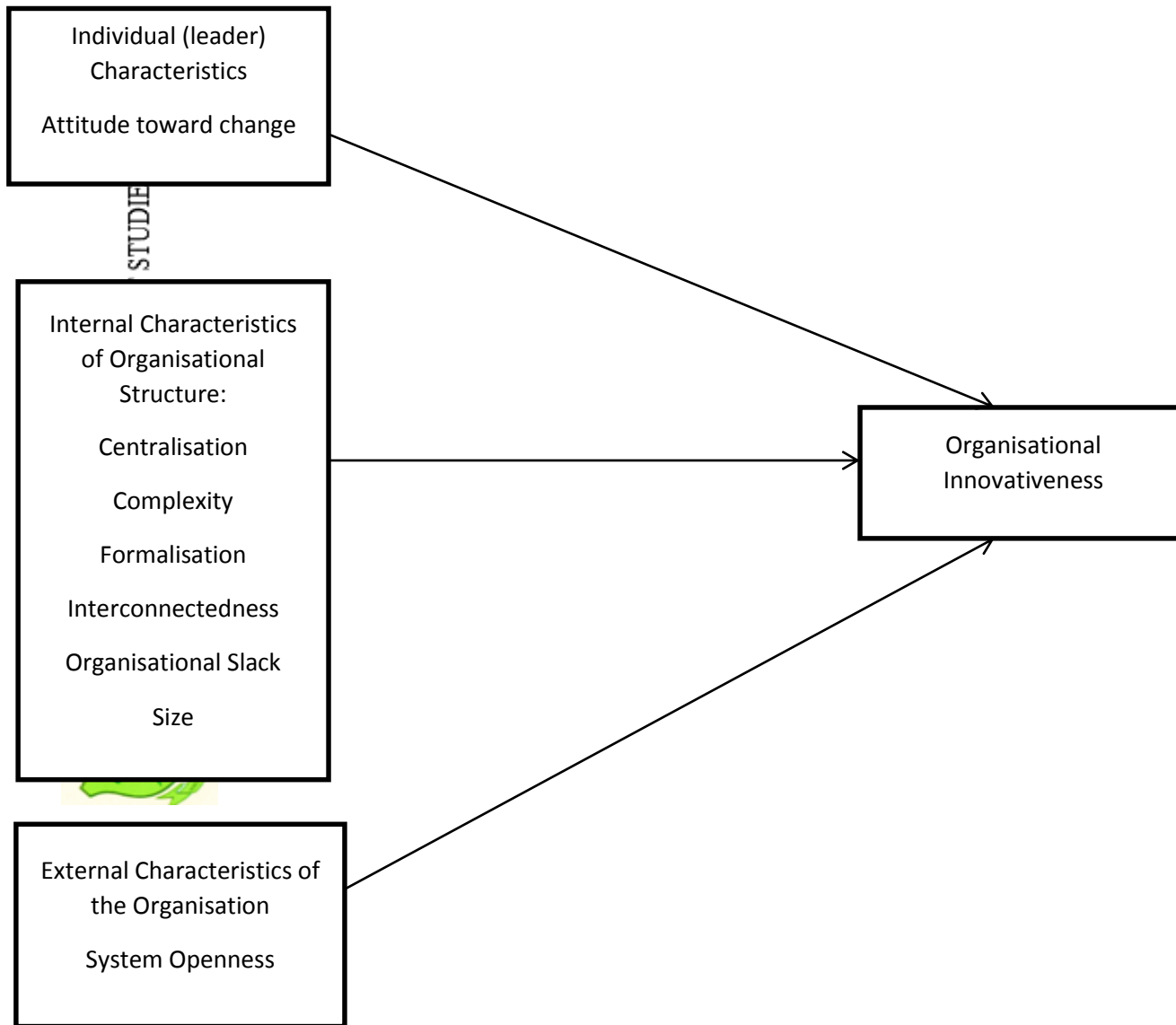
This third independent variable has a construct system openness which is positively related to the organisational innovativeness. The construct describes the extent to which the organisations system is understood externally by others.

Salimonu, et al, (2013) state that when Diffusion Innovation is applied to organisational level, inconsistency normally occurs due to failure to recognises the difference in unit of analysis,

environment, and technology characteristics or they cannot predict the adoption of complex Information Technology system.



Figure 2.1: Diffusion of Innovations (Source: Rogers 2003)



From figure 2.1 above, the attitude of the leader of an organisation towards change, its internal structure and the external environment determines an organisational innovativeness.

Furthermore, Diffusion Innovation is defined as the process by which an innovation is adopted and gains acceptance by members of a certain community (Roger, 2003). According to Roger (2003) four major factors that interact to influence the diffusion of an innovation are; the features of the innovation itself, how information about the innovation is communicated, time and the nature of the social system into which the innovation is being introduced (Roger, 2003). Diffusion research, in its simplest form, investigates how these major factors, and a multitude of other factors, interact to facilitate or impede the adoption of a specific product or practice among members of a particular adopter group.

Rogers (2003) presents a comprehensive theory of diffusion in four widely-used theories which are as follow:

- **Knowledge, Persuasion, Decision, Implementation, and Confirmation:** According to Rogers (2003), potential adopters of an innovation must learn about the innovation, be persuaded as to the merits of the innovation, decide to adopt, implement the innovation, and confirm (reaffirm or reject) the decision to adopt the innovation.
- **Individual Innovativeness Theory:** According to Rogers (2003), individuals who are predisposed to being innovative will adopt an innovation earlier than those who are less predisposed. On the extreme of the distribution are the innovators. Innovators are the risk takers and pioneers who adopt an innovation very early in the diffusion process. On the other extreme are the laggards who resist adopting an innovation until rather late in the diffusion process.



- **The Rate of Adoption Theory:** According to Rogers (2003) this theory posits that innovations are diffused over time in a pattern that resembles an s-shape curve. Rate of Adoption theorized that an innovation goes through a period of slow, gradual growth before experiencing a period of relatively dramatic and rapid growth. The theory also states that following the period of rapid growth, the innovation's rate of adoption will gradually stabilise and eventually decline.
- **The Theory of Perceived Attributes:** This is the fourth theory which states that potential adopters will judge an innovation based on their perception with regard to five attributes of the innovation. These attributes are: Trialability; Observability; Relative Advantage; Complexity; and Compatibility. The theory holds that an innovation will experience an increase rate of diffusion if potential adopters perceive that the innovation can be tried on a limited basis before adoption; offer observable results; has an advantage relative to other innovations or status quo; is not overly complex; and compatible with existing practices and values (Rogers,2003).

The researcher therefore, highlights here that the selection of the Diffusion of Innovation Theory is more appropriate for this study because it covers all the issues that are affected and subjected to examination during the analysis of field data.

2.2.2. Technology-Organisation-Environment (TOE) Framework

According to Salimonu, et al (2013) the TOE framework was developed in 1990. It identifies three features of an enterprise's context that affect series of steps taken to adopt and implements a technological innovation. These three features are:

- **Technological Context (Factors):** The TOE framework assesses an organisation decision to implement an innovation and technologies appropriate for the organisation.

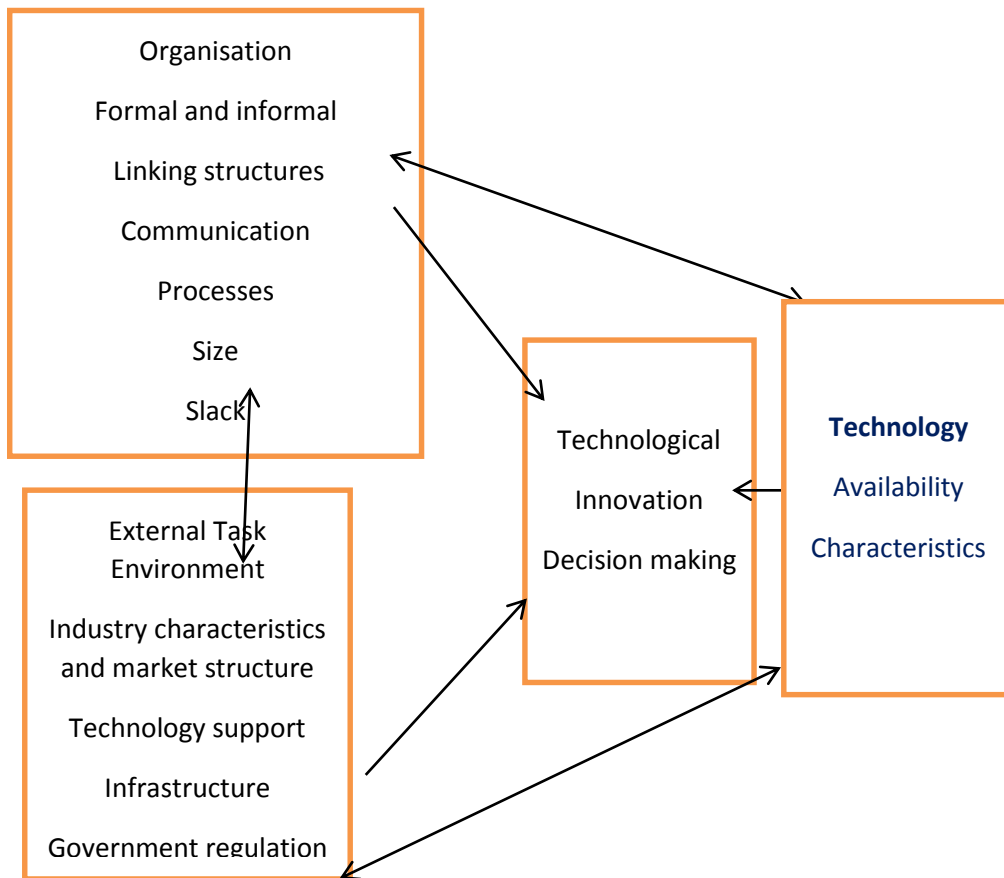
- **Organisational Context (attributes):** This is where the TOE framework assesses the company or organisation size, resources availability and quality of human resources.
- **Environmental Context (factors):** This is where the TOE framework assesses the business environment of the organisation.

Salimonu, et al (2013) highlight that the TOE framework provides a useful analytical framework that can be used for studying adoption and full understanding of different types of IT innovation. The TOE framework has a solid theoretical basis unchanging empirical support, and the capability of application to IS innovation domains, though specific factors identified within the three contexts may vary across different studies.

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Figure 2.2: Technology-Organisation-Environment



Source: Tornatzky and Fleischer (1990)

Figure 2.2, above, the formal and informal structures such as communication processes, the size and slack resources available to the organisation, the external environment within which the organisation operates and the availability and characteristics of the technology itself determines an organisational innovativeness.

To add more information on why the TOE framework is suitable as a theory in this study, Angeles (2013) claims the Technology-Organisation-Environment framework posits three elements that influence technological adoption; the environmental context, the organisational context, and the technological context. The environmental context is the arena surrounding the organisation, which consist of multiple stakeholders such as industry members, competitors, suppliers, customers, the government, the community (Angeles, 2013).

According to the framework, these stakeholders can influence how a firm interprets the need for innovation, its ability to acquire the resources for pursuing innovation, and its capability for actually deploying it. These stakeholders could either support or block technological innovation (Angeles, 2013). Angeles (2013) also stated that changes in the market patterns

and the existence of competitive conditions can persuade firms or organisations to use various forms of technological innovations. Among other things outlined are; government regulation as a powerful tool for constraining a firm or organisations' operational activities; increasing cost of production; and instigating an investigation of technologies that must meet specified mandatory criteria.

The second element put forward is the organisational context. In this, a range of descriptive measures characterised the organisational context; firm size; Centralisation, Formalisation, and Complexity of its managerial structure; the quality of its human resources; and the amount of slack resources available internally; formal and informal linkages within and outside the



firm or organisation; decision making and internal communication methods; and boundary spanning mechanisms to communicate with the external environment.

Angeles (2013) stated that, top executives of an organisation can energise major organisational changes by (a) developing and communicating a clear image of the firm's strategy, core values and role of technology in meeting this strategy; (b) sending consistent signals both within and outside the organisation about the value of the innovation; and (c) creating a team responsible for crafting a vision relevant to the innovation.

The third element posited by the framework presents the system design perspective which is a synthesis of the following approaches; technocentric, sociocentric, conflict/bargaining, systems life cycle, and socio-technical systems. According to them, the technocentric approach espouses the notion that technological factors dominate the implementation experience, thus leading to the following consequences: (a) there should be a detailed technical plan for implementation; (b) methods of engineering should help in the redesign of business processes and jobs; (c) the innovation should be able to be integrated with existing technical system; and (d) technical criteria should be used in measuring implementation effectiveness (Angeles,2013)

The sociocentric approach however focuses on making the organisation more flexible, humanistic, and open to changes brought about by the innovation (Angeles, 2013). Human resource policies involving employee selection, compensation, appraisal, and training, all of which have important implications for innovation implementation have to be modified to fit the innovation and finally, the "systems design approach" also prescribe the incorporation of end user needs into the requirement definition stage; designing the new system so that it can integrate with the larger IT system that encompasses the organisation, and ensuring the



provision of resources for reliable system maintenance as well as providing for both incremental and radical system changes if called for.

2.3. Trajectory of Technological Innovations in Electoral Reforms in Ghana

In his study of democratisation, Huntington (1991) observed that, the third wave of democratisation started in most third world countries in the early 1990's. Different countries are moving away from hitherto authoritarian regimes towards democracy. This sweeping democratization across the globe gained currency due to a number of reasons. In the view of Gyekye-Jandoh (2013:74), the gradual democratisation in Ghana has come about as result of three main factors; the role of the International Community, Civil Society and Electoral Reforms. In emphasising the importance of elections in the democratisation process, Gyekye-Jandoh, (2013:74), stated that, "when the electoral machinery fails in its duty of facilitation of free and fair elections, the repercussion is the destruction of the public's faith in the whole concept of democratic governance". However, electoral fraud has continued to characterise the management of elections in many emerging democracies, producing large-scale protest and violence recently in Iran, Nigeria, Ethiopia, Kenya, and Zimbabwe to mention a few. In the opinion of Gyekye-Jandoh, this fraud also threatens citizen perceptions of government legitimacy, making it less likely that people think it is worth their time to turn out and vote in the future.

Ghana's electoral process and election administration under the Fourth Republic have continued to see improvements aimed at enhancing transparency and credibility. However, fears of vote rigging have largely persisted, and thus inspired a number of anti-rigging proposals and measures to ensure electoral integrity (CDD-Ghana, 2008). These measures and



proposals largely resulted in technology aided reforms that the Electoral Commission started introducing soon after the disputed 1992 Presidential and Parliamentary Elections.

In Ghana, the desire from stakeholders to constantly refine the electoral system to enable it generate the requisite outcomes is increasingly becoming imperative. As a result, electoral reforms are gradually becoming a permanent feature of the Ghana's electoral system. There are several forms or aspects of electoral reform in the literature. However, a 'significant aspect of electoral reform is the nature and structure of the institutions engaged in the management of elections or in delivering electoral services'(Gyekye-Jandoh, 2013:77). According to the International Institute for Democracy and Electoral Assistance (IIDEA 2006), these reforms may enhance the independence of the Elections Management Body (EMB). IIDEA (2006) cited countries that have created independent model Elections Management Bodies as Indonesia, Mexico, Nigeria, Romania and South Africa.

The initiation of electoral reforms often originates from various sources. Some reform initiatives usually emanate from within the Elections Management Body whilst others come from external sources. For instance, in the case of Sweden, the suggestions for electoral reforms were initiated by the Elections Management Body itself. In countries such as New Zealand and the United Kingdom, electoral reforms were initiated by the government, whereas pressure from local Civil Society or International Groups also instigates reform of electoral management arrangements in such countries as Georgia and Liberia (IIDEA 2006). In Ghana, most of the electoral reforms that have been introduced since the coming into effect of the 1992 Republican Constitution were a result of complaints from stakeholder's mostly registered political parties.



2.4 Regime Analysis of Election Management

This section of the study traced the evolution of election management from the colonial administration to the fourth republic. The analysis is broken down into the various regimes the Ghana has gone through starting with the colonial administration discussed below.

2.4.1. The Colonial Administration Era

Election management has become pivotal in Ghana's democratic development. However, its effective management is becoming a challenge in Ghana despite a high level of transformation both in the Elections Management Body and the electoral process since pre-independence. The Gold Coast, before 1951, relied on the Electoral College System provided for in the 1925 Constitution such as the Provincial Council of Chiefs which later became the Joint Provincial Council of Chiefs under the 1946 Constitution with similar functions. The arrangement under the two constitutions only allowed a few people to take decisions on behalf of the larger population. The legislative elections of 1951, 1954 and 1956 were conducted by the Colonial Government controlled by the Central Government. Electoral activities such as the registration of electors were undertaken by District Commissioners and their staff coordinated by an Elections Officer in a Secretariat in Accra (Crabbe, 1975).

With the introduction of the elective principle in the Political Administration of Ghana, the Electoral Ordinance of 1953 was passed which mandated the Ministry of Local Government to supervise the conduct of both local and municipal elections. This witnessed the conduct of the first Legislative Assembly Elections under Universal Adult Suffrage with the active participation of political parties and subsequently the 1954 and 1956 plebiscite.



2.4.2. The Convention People's Party (CPP) Administration Era

There was no much departure in election management in the post-independence era under the Convention People's Party (CPP) administration from the colonial arrangements. The only innovation was a shift in the responsibility of the Governor in election management to the President, who was tasked with the coming into force of Act 291 of 1965, with a duty, in the case of a General Election to the National Assembly, and acting in accordance with section 3 of the National Assembly Act, (Act 86) to fix time or times for the holding of elections.

However, there was some conflict between the role of the Minister for Local Government and the President. Under section 35 (5) of Act 291 of 1965, the Minister has the power to fix periods for the nomination of candidates as well as the holding of elections in the case of Local Assembly Elections. It was possible for the President to override such dates determined by the Minister if in his view; he thinks the date will not favour him. This arrangement did not provide level playing field during elections since they were subject to executive manipulations.

2.4.3. The National Liberation Council (NLC) Administration Era

Under the Military Regimes, dating back to the late 1960's to 1979, there was a popular and sustained call from stakeholders for an independent electoral body to be in charge of managing elections in Ghana. In response to these popular concerns, the National Liberation Council (NLC) Regime which toppled the CPP administration in 1966 set up a Commission to look into the electoral and local government structure for Ghana. The Commission was established by the Electoral Commission Instrument, 1966 (E.I. 183) on December 22nd 1966 and was inaugurated on the 17th January 1967. The Commission was made up of sixteen (16)



members and chaired by J.B. Siriboe which became known as the Siriboe Commission with terms and reference including a look at;

- The electoral system;
- Delimitation and demarcation of parliamentary electoral districts and;
- The reorganisation of Local Authorities and its attendant problems (Crabbe, 1975)

On the completion of its work, the Commission recommended to the National Liberation Council government to create an independent and permanent body with a mandate to manage the electoral process. The report also outlined the following as the functions of such a body;

- The registration of voters and an annual revision of the register of voters;
- The conduct of all public election, referenda and plebiscites;
- Periodic review of the boundaries of parliamentary constituencies on the basis of laws provided for in the Constitution and the electoral laws;
- The recruitment and dismissal of its operatives
- The enactment of procedural rules and regulations under the law to guide the conduct of elections (Commission of Enquiry Report:1967);
- The proper storage and use of all registration and election materials;
- The registration of political parties and their symbols in accordance with rules prescribed by law; and
- The carrying out of the provision of section10 of part II of the Electoral Provisions Act, 1965 (Act 291) relating to the division of Electoral Districts into wards (Act: 291:1965).

In operationalizing the recommendations, the National Liberation Council administration set up an Independent Electoral Commission under the Interim Electoral Commission Decree



(NLCD 221) of 1968 to replace the Electoral Department under the Ministry of Local Government charged with the responsibility for undertaking electoral activities. An Appeal Court judge, Justice V.C.R.A.C. Crabbe was appointed as the first Interim Electoral Commissioner and a Sole Commissioner which conducted the 1969 Legislative Elections using the electoral system that was developed based on the Siriboe Commission's recommendations (Crabbe, 1975).

Elections management under Justice Crabbe went through several reforms in such areas as the design and distribution of ballot papers, collation and declaration of election results as well as the role of party agents and the effective verification of voters to prevent impersonation and ensure credible polls. Other reforms include the counting of votes and the proper ballot accounting conducted at each polling station at the close of polls.

2.4.4. The Progress Party Administration Era

There was not much activity in terms of election management under the Progress Party Administration after Justice Crabbe supervised and conducted the 1969 General Elections using recommendations from the Siriboe Commission. However, Justice Crabbe was returned to the bench in 1971 and the Independent Electoral Commission became a permanent body with a substantive Electoral Commissioner under Article 30 of the 1969 Constitution (Crabbe, 1975)

2.4.5. The Supreme Military Council (SMC I &II) Administration Era

The 1972 coup d'état led by the Supreme Military Council 1 (SMC 1) witnessed the dissolution of the Independent Electoral Commission and a return of its functions back to the Ministry of Local Government and named as the Civil Registration and Electoral Division (CRED) headed by a Director in 1974. SMC1 re-established the Electoral Commission under



Supreme Military Council Decree (SMCD 114) of 2nd August 1977. Justice Isaac Kobina Abban was appointed as the Electoral Commissioner and for the first time a Deputy Electoral Commissioner in the person of Mr. Addoquaye McGranky Quaye was appointed under a provision in SMCD 132 of 1977. The first assignment of the new Electoral Commission was to conduct the 1978 referendum which was to determine the suitability of the Union Government (UNIGOV) advocated by the General I.K. Acheampong regime as a substitute to party politics. The evolution process saw the replacement of Mr. A. M. Quaye, who was the Deputy Electoral Commissioner with Mr. Justice Kinsley-Nyinah, a retired Appeal Court Judge in 1975 as the new Electoral Commissioner by the Supreme Military Council II administration (Crabbe, 1975)

2.4.6. The Armed Force Revolution Council (AFRC) Administration Era

As part of the transitional process by the Armed Forces Revolutionary Council (AFRC), the Electoral Commission was re-established under Article 37 of the 1979 Constitution. Justice Kinsley-Nyinah's reign spanned the period 1978 to 1982 which supervised the 1979 Presidential and Parliamentary Elections to usher in the Third Republic. With the return of Flight Lt. Jerry John Rawlings under the Provisional National Defense Council (PNDC), the Electoral Commission was abolished, the 1979 Constitution suspended Justice Kinsley-Nyinah was given an indefinite leave and later his appointment terminated.

2.4.7 The Provisional National Defence Council Administration Era

With a commitment to return Ghana to a true democracy, the Provisional National Defence Council (PNDC) by (establishment) Proclamation, 1981 set up the National Commission for Democracy (NCD). From 1982 to the 1992 when the first transitional election took place which witnessed a return of the country to democracy, a lot of reorientation of the mind-set of

Ghanaians on political governance took place which as well impacted on election management in the country.

The PNDC (establishment) Proclamation (Supplementary and Consequential Provisions) Law 1982, PNDC Law 42, Section 32, charged the National Commission for Democracy (NCD) with the mandate of managing elections as spelt out in the suspended 1979 Constitution with some additional responsibility. Functions such as embarking on educational programmes to create awareness on the objectives of the revolutionary transformation were rigorously pursued. The National Commission for Democracy undertook key statutory functions such as the demarcation of electoral boundaries and the formulation of programmes to facilitate the effective realisation of a true democracy in Ghana. The newly created National Commission for Democracy was headed by a retired Appeal Court Judge, Justice Daniel Francis Annan who fashioned out a system of democracy based on grassroots participatory decision-making through a Decentralised System (Gyimah-Boadi, 1999a)

Under the electoral functions, the National Commission for Democracy undertook the following;



- Demarcation of District Boundaries and Electoral Areas;
- Undertake the registration of voters and;
- Supervise and conduct elections to the District Assemblies, Presidential and Parliamentary Elections as well as elections to the Regional and National Houses of Chief.

This evolution of the Elections Management Body was taking place at the time the third wave of democratisation that swept across Eastern Europe, Latin America and South-East Asia had just made an entry into the African Continent. Following the regional forums that were

organised by the National Commission for Democracy (NCD) in collaboration with the Ministry of Local Government and Ministry of Information presented a report titled “Evolving True Democracy” to the Provisional National Defense Council (PNDC) administration which was subsequently accepted in 1991 and on the 26th of August the same year, a 258 member Consultative Assembly was inaugurated to draft a new constitution for Ghana.

In line with the reform process, the National Commission for Democracy (NCD) was replaced with an Independent National Electoral Commission (INEC) on the 28th of February 1992 which was made up of an eleven member body consisting of ten (10) men and one (1) woman. The PNDC Law 271 that created the INEC provided for an Executive Chairman and two Deputy Chairmen responsible for Finance and Administration and Operations respectively. Mr. Justice Ofori-Boateng, an Appeal Court Judge was appointed as the Chairman with Nana Oduro Numapau II and Dr. Kwadwo Afari-Gyan as Deputy Chairmen in charge of Finance and Administration and Operations respectively.

2.4.8. Elections Management under the Fourth Republic

Becoming a victim of the wave of democratization, Ghana was returned to a multiparty democracy. With the coming into force of the 1992 Republican Constitution, Article 43(1) reconstituted the Electoral Commission to consist of a Chairman; two Deputy Chairmen and; four other members who are appointed by the president under article 70 of the Constitution. Article 45 of the Constitution spelt out the functions of the Constitution as follows;

- (a) to compile the Register of Voters and revise it at such periods as may be determined by law;
- (b) to demarcate the electoral boundaries for both national and local government elections;



- (c) to conduct and supervise all public elections and referenda;
- (d) to educate the people on the electoral process and its purpose;
- (e) to undertake programmes for the expansion of the registration of voters; and
- (f) to perform such other functions as may be prescribed by law.

In response to complaints from stakeholders after the transitional elections of 1992 and coming on the heels of the inauguration of the Electoral Commission in April 1993, the Commission started to implement reforms aimed at addressing these concerns. Gyimah-Boadi (1999a) outlined measures the Electoral Commission adopted to build public confidence in the Electoral Commission such as the compilation of a new Voters Register, the training of Polling Assistants and Party Agents, the accreditation of Domestic and International Observers and the formation of Interparty Advisory Committee among others. Most of these reforms were heavily driven by technological innovations when they were been implemented. However, Gyimah-Boadi (1999a) observed that there were some shortcomings with the reforms. In his view, the cost of a second election like that of the 1996 General Elections was quite expensive, yet there were still serious lapses with the Voters Register in spite of the heavy spending. Even with these reforms, there were some who still held the view that there was no genuine level playing field during the elections. The next section is devoted to assessment of the technological innovations that the Election Commission adopted in the implementation of some of these reforms.

2.5. Technological Innovation Electoral Reforms

The study in this section discussed some of the technological innovations that the Electoral Commission has deployed over the years to facilitate the implementation of electoral reforms



in Ghana. Below are some of the major innovations introduced since the disputed 1992 general elections.

2.5.1. The Transparent Ballot Box (TBB)

The first technological innovation was the introduction of the Transparent Ballot Boxes (TBB) in the 1996 General Elections. The Opaque Ballot Box (OBB) was used in the 1992 Presidential and Parliamentary Election and resulted in alleged “ballot stuffing” by the Opposition Political Parties. The Electoral Commission considered this complaint seriously because the ballot box is an essential material for elections. It is critical because, it is one of the tools for establishing the secrecy of the ballot. The design of the slot of the Transparent Ballot Box ensures only one ballot paper can be put in at a time. This goes to reinforce the principle of fairness since each voter is entitled to cast only one vote. A close examination of the nature of the complaint shows its linkage with transparency and fairness as values of the Electoral Commission. The argument then was that, the Electoral Commission was not transparent and fair in its operations as a result of alleged ballot stuffing and ability of people to put in more than one ballot at a time without being noticed. The introduction of the

Transparent Ballot Boxes raised the confidence and trust of stakeholders and they went into the elections with the belief that the Commission was addressing their concerns. It also records improvement in the management of election materials since packaging and conveying has become easier and less cumbersome. The boxes did not also lend themselves too much to the vagaries of the weather compared with the Opaque Ballot Boxes which were metal.

Consequently, the introduction of the Transparent Ballot Box innovation in the 1996 Presidential and Parliamentary Elections which was facilitated by Donor Support resulted in a rise in voter turnout shooting up from 56.2 percent in 1992 to a record 78.2 percent in 1996,



showing the heightened level of confidence stakeholders have in the electoral process (EC, 2000)

However, it must also be observed that, the Transparent Ballot Box alone is not a panacea to ballot stuffing. The ultimate solution to the problem should be “vigilance on the part of Political Party and Candidates Agents”. For instance, if all Candidates’ or Political Party Agents to a particular polling station fail to turn up before the opening of the poll on the election day, an election management team assigned to that polling station with the same lineage towards a particular candidate or political party could still stuff the ballot box. In terms of a professional understanding of the system, the Transparent Ballot Box did not promote transparency; it only satisfied the desires of stakeholders. However, its introduction has promoted democracy by helping to exposed unscrupulous person who tried to cheat through smuggling fake Ballot Papers into the Ballot Box.

2.5.2. Photo and Thumbprint Voter Identification Cards

Effective system of voter identification is very crucial in every election. The need to ensure that only persons qualified by law are identified and given the opportunity to cast their votes cannot be underscored in any democratic elections, since that constitutes an important determinant of the credibility of the election. However, the major complaint from stakeholders with regards to the manner in which voters were identified has to do with the used of slips by voters which bore only their names instead of Identification Cards. These slips did not have any special features even though numbered. In the view of the opposition Political Parties, that created fertile grounds for mass impersonation and multiple voting during the 1992 General Elections. Many voters who enrolled on the voter register did not have identification documents and were merely admitted to cast their votes on the polling day by self-attestation.



The opposition Political Parties contended further that, that method of voter identification was discriminatory and only gave an upper hand to the party in government to rig the elections, bringing the core values of the Electoral Commission under a barrage of attacks from the electorate and Political Parties as well as local Civil Society Organisations.

In trying to cure that ill, the Electoral Commission first resorted to the compilation of a new clean Voters Register giving the posturing of the stakeholders towards the register used for the first transitional general elections of 1992. Ayee (2001:15) argued that “there is no doubt that a credible electoral register is key to the administration of free and fair elections”. Ayee (2001) further observed that, the register that was created before the first transitional elections was certainly flawed and it was therefore clear that its continuous use for the conduct of the 1996 General Elections was a recipe for electoral violence and a worsening of the political environment hence the urgent need for electoral reforms (Ayee, 2001).

The Electoral Commission therefore deployed the right technological innovations to develop a reasonable good register and an effective voter identification system for the elections. It

should be noted that, while technological innovations have brought great benefits in efficiency and effectiveness to the electoral process, these earlier technological innovations were drawn from other fields, where the innovation had been thoroughly and rigorously developed and tested. However, the effective computerization of voter registration in Ghana started in 1988, but the issue of voter registration became prominent with the first multiparty election in 1992 which were hotly contested with a voter’s register that was having a credibility crisis (Kangah and Sarfo-Kantanka, 1998).



2.5.3. Re-Designation of the Ballot Paper

The re-designation of the Ballot Paper was another technological innovation introduced after the 1992 General Elections. Hitherto, the Ballot Paper simply contained the names and symbols of Political Parties and Candidates. The complaint which necessitated this reform came mainly from the Political Parties and Candidates. The contention was that similar names and symbols made the Ballot Paper unclear, the area of the thumbprint was not clearly defined, and as a result, thumbprints overlapped resulting in a lot of ballots being declared invalid. Also ballots were not unique in the sense that, there were not properly numbered to facilitate tracking. In the view of stakeholders, this anomaly has failed to create a level playing field for all contestants in the elections. In response to this, the Electoral Commission engaged higher improved technological innovations such as the use of digital cameras and high quality stencil for printing.

Appropriate computer programmes such as Coral Draw and Publisher were employed to redesign the Ballot Paper. With the aid of this technological innovation, a double box was introduced for the thumbprint area which facilitated a redefinition of what should constitute a valid marking on the Ballot Paper.

Black and white photographs of candidates were also introduced in the Ballot Paper but have since been changed to colour photographs. This reform of the Ballot Paper reduces controversies surrounding ballot counting during elections. Stakeholders also agreed it has created a level playing field for all contestants in elections, which is a core value of the Electoral Commission.



2.5.4. Optical Mark Readers and Polaroid Cameras

The Electoral Commission with the assistance of United States Agency for International Development (USAID) and International Foundation for Electoral System (IFES) as well as other international donors embarked on an exercise to completely replace the 1992 voters register in October 1995 (Smith, 2002, Holtved, 2010). The introduction of the Optical Mark Readers (OMR) scanners in the voter registration system was the first kind of technological innovations introduced by the Electoral Commission. However, before its adoption, the West African Examinations Council (WAEC) was already using it for the grading of student test. The technology was applied in the voter registration for data capturing which significantly improved the acceptability of the registration exercise. According to Kangah and Sarfo-Kantanka (1998) among other immediate benefits that were accrued are; the timely completion of the exercise; high level of accuracy of the captured data compared with previous years; and above all, there was a significant lowering of cost to the Electoral Commission.

The technology enhanced the identification process with two significant innovations by making it possible for Voter ID Cards to be issued to voters with unique identification numbers drawn from the OMR forms and photographs issued to qualified voters in urban areas. The Optical Recognition Technology was used to scan the forms compiled during the voter registration process in order to computerize the data. Photographs of voters were first taken with Polaroid and later Digital Cameras and Printers, and Voter ID Cards, voters in the rural areas issued with ID cards with unique numbers and thumbprints.

The technology also enable the Electoral Commission to cover the entire nation with Voters ID cards with photographs before the December 2000 General Elections. The introduction of



the Optical Mark Recognition (OMR) technology in the Voter Registration System in connection with data capturing improved the 1995 voter registration exercise significantly. In subsequent years, the Electoral Commission continued to pursue the use of the Optical Mark Scanning (OMS) technology in voter registration, nomination of candidates and the capturing of election results.

2.5.5. Networking Systems

To boost service delivery through the application of technological innovations, the Electoral Commission in the same year 2000 installed a local Area Network (LAN) at its head office linking nearly one hundred computers located on its Head office premises. The installation of a Wide Area Network (WAN) to link Regional and District Offices to the Head office Local Area Network was also completed before the December 2000 elections.

The National Network facilitated both data transmission and internet services at the Electoral Commission. It also created a medium for internal communication and coordination of activities and opens the Electoral Commission to regular information flow from international election focused organisations in aid of the democratisation process. The cumulative effect of

this reform on the electoral process is that, stakeholders renewed their trust in the electoral process with the elimination of delays that hitherto characterised the capturing, compilation and transmission of election results which often creates anxiety with its potential election related violence, hence, reinforcing its core value of transparency in its operations and service delivery.

2.5.6. Carbonated Results Declaration Forms

Coming on the heels of troubled elections on the African Continent, particularly Nigeria, Kenya and Zimbabwe, Ghana's 2008 General Elections was of much interest to both



International and Local Observers. The technological innovation the Electoral Commission introduced to solve the difficulty Presiding Officers go through in repeating results on different results Declaration Forms at the Polling Stations and Constituency Centres, to eliminate the trans-positional errors that usually characterised such activities was the Carbonated Results forms. This ensured that election results are recorded only once and copies of results instantly issued to Party/ Candidate agents. Pre-printing of presidential candidates' names on the Presidential Results Declaration and Constituency Results Declaration for the position of president forms to prevent any mistakes in the spelling of names on polling day was also introduced as an innovation which completely eliminated those errors (EC, 2008).

2.5.7. Geographic Information Systems Mapping of Polling Stations

Stakeholder agitations over frequent shortage of election materials and late start of exercises have been a challenge to the Electoral Commission. In trying to get a clearer picture of the location of polling stations for purposes of effective and efficient logistical planning and management during elections and to eliminate the bottlenecks that usually characterised the deployment of both election material and officials, the Electoral Commission during the 2008 general elections employed the Geographic Information System (GIS) technology through which Polling Stations dotted across the length and breadth of the country were captured with the aid of the Geographic Positioning System Device and Digital Cameras were used to capture the latitudes and longitudes as well as the pictures of polling stations that enabled the Electoral Commission to place them on Google map. This technological innovation enabled the Electoral Commission to identify riverine areas and other inaccessible polling stations which enabled the Electoral Commission to allocate resources and the kind of transportation

facility that best suit such terrains. It enabled the Electoral Commission to for instance commandeered helicopters to airlift election materials and personnel to inaccessible areas. This resulted in the elimination of delays that usually characterised the opening of polls in such areas and also the supply of sufficient materials to such difficult areas on Election Day.

2.5.8. Very-Small- Aperture- Terminal

As the fifth successive Presidential and Parliamentary elections to be conducted, the Electoral Commission demonstrated its responsiveness to calls from stakeholders on the waiting time for the declaration of election results. This has always resulted in heightened tension as a result of mistrust and suspicion among Political Parties. The Electoral Commission introduced the Very-Small Aperture Terminal (V-SAT) technology during the 2008 Presidential and Parliamentary Elections to improve on the receipt of results from the constituency centres. This technological innovation facilitated the transmission of election in an efficient and cost-effective manner to the Head office from the constituencies.

2.5.9. Biometric System of Registration and Voting

Prior to 2012, stakeholder agitation for a credible register for the elections was heightened leading to the adoption of the Biometric System. However, the Biometric System has become trendy in many African countries undertaking electoral reforms (Debrah, 2015). Citing Nigeria and South Africa, Debrah (2015) stated that, these countries have incorporated the use of Biometric Registration and Voting into their electoral process. This was deemed necessary due the persistent complains of vote rigging including multiple voting and impersonation. The Political Stakeholders of the electoral process started agitation for a full proof electoral process to block the loopholes. As a result, the Biometric Registration and Biometric



Verification were grafted onto the 2012 elections, which show a radical departure from the elections' norms and practices.

The Electoral Commission deployed the Biometric Technology in all aspects of the electoral process. Its implementation started with the registration of voters. The system offers the Electoral Commission an opportunity to accurately capture the biometric data (unique physical features) of applicants in addition to their demographic data. The intent of implementing the Biometric System in the Voter Registration System is to prevent multiple voter registration and voting, as well as mitigating the incidence of fraud during registration and elections. In all, the Electoral Commission was able to successfully register a total of 14,060,573 people within a period of 40 days. After an exhibition of the provisional voters register and the subsequent handling of objections to inclusion in the voter, the total number of voters eligible to cast their votes in the 2012 elections stood at 14,031,793.

The Biometric System is made up of multiple systems to store and process data critical to the Biometric System. The systems are mainly: the Automatic Fingerprint Identification System

(AFIS) software including adjudication functions and servers, Voter Database Management Software, Database Servers, Data Collection Software, Data Storage Software as well as

Digital Mobile Registration Kits. The system uses the V-Sat technology which is installed in all Districts and Regional Offices to facilitate the export of daily registration data from Districts Offices to the National Data Centre in Accra. This has resulted in the shortening of the time span for generating the Voters Register. It also facilitated the elimination of human errors often associated with the packaging and transporting large volumes of registration forms.



The Automatic Fingerprint Identification System (AFIS) software with its adjudication functions embedded in the Biometric System is able to undertake the procedure referred to as “matching” which compares both the demographic and biometric data of every registrant on the database. This process facilitates the identification of persons who have indulged in multiple registrations. Another component of the Biometric System is the Voter Management System (VMS) software. Unlike the previous technology where data from the exhibition exercise on issues such as major and minor corrections and objections were transported to the IT department at the headquarters for processing, the Voter Management System software allows all such operations to be carried out in the District Offices and posted to the National Data Centre in Accra with the aid of the V-SAT System. This, in effect, ensures accuracy in data capturing and also reduces the time and cost in processing these in Accra.

Additionally, the system also came along with the application of other technological innovations such as the use of mobile telephone. The mobile telephone is unquestionably currently the most versatile and most commonly used tool for participation in the body-politic of Ghana. During the exhibition of the Biometric Voters Register, the Electoral Commission



entered into a contract with a Service Provider that created a mobile telephone platform where voters, from the comfort of their offices, homes or cars can simply check their particulars in the Voters Register by simply sending their voters Identification numbers to a short code provided.

The Biometric System heightened the confidence of stakeholders in the 2012 elections. Stakeholders trusted the accuracy and credibility of the electoral roll. It was deemed that the register is devoid of names of unqualified persons as well as those who have done double or multiple registrations. The Electoral Commission was seen as creating a level playing field for

all candidates and political parties to the election and hence reinforcing its core values of “freeness” and “fairness”. This is important because the credibility and acceptability of elections depends to a very large extent on the quality of the Voters Register. The system also received a positive assessment from the general public and Collation of Domestic Election Observers (CODEO), its long-time ally in elections administration in the country. According to a CODEO (2012a) survey, among the Ghanaian registered voters, 78 percent of respondents surveyed agreed that the Biometric Registration represented a remarkable improvement compared with the old system, while 87 percent considered it a useful tool for promoting credible and peaceful elections.

However, issues were raised regarding the malfunctioning of the Biometric Verification Device (BVD) on Election Day. CODEO (2012b) reported that the BVDs failed to scan the finger prints of voters at some point during voting in 19 percent of all polling stations. These technical glitches resulted in the landmark Presidential Petition at the Supreme Court. Hence, the objective of this study to assess technological innovations in electoral reforms and good democratic governance in Ghana and Tamale Metropolis in particular is appropriate.



2.5.10. Elections Results Management System

In introducing some of the electoral reforms proposed after the 2012 Presidential Petition ruling, the Electoral Commission adopted the Election Results Management System at both the National and Constituency Collation Centres. This Constituency Collation Centre application is a robust application which was used to capture, validate, collate and transmit election results from the Constituency Collation Centre to the National Collation Centre. The application is an integrated Election Results Management System (ERMS) and runs on a windows based workstation.

The application facilitates the operations at the Constituency Collation Centre (CCC) through intuitive and easy to use interfaces that are segmented in line with the Manual Procedures Collation at the Constituency Collation Centre.

The Constituency Collation Centre application runs on a laptop computer with the application installed. It uses a Webcam, Memory Stick with token, a Printer and Connectivity to Customer Premise Equipment (CPE) for the Virtual Private Network (VPN). The Constituency Collation Centre application utilizes the Virtual Private Network which allows results to automatically transmit during the capture process to the National Collation Centre in Accra. It also served as a back up to the Manual Collation as well as comparing the accuracy of the Manually Collated Results before declaration.

The public projection of the results at the Constituency Collation Centre also gave opportunity to the general public who could not have access to the Room to see results from Polling Stations as they are captured. This has enhanced the transparency of the results collation process and also takes away mystery that hitherto surrounds the so-called strong room (EC, 2016).

In conclusion, the above trajectory has clearly outlined an independent Elections Management Body that has a set of cherished core values which it jealously guard without interference from any quarters in the execution of its mandate as a contribution to the democratization process in Ghana. Gyekye-Jandoh (2013) argument supported this position, stating that, the effectiveness of the Election Management Body in emerging democracies and even established ones depended largely on its autonomy from government. It is also supported by Ayee's (1998) and Goodwin-Gill's (1994) positions that "impartial and independent electoral bodies are highly important for democracy and its consolidation prospects.



The section also reveals that most of the complaints that resulted in the introduction of the various reforms in the electoral process emanates from Political Parties and Civil Society. This position is buttressed by Gyekye-Jandoh (2013) when she observed that, these changes or reforms were made in collaboration with the Political Parties and donors and showed that years of serious planning before an election are crucial and critical to its success. Ghana's relative success can be attributed to its voter registration system which has evolved incrementally, with the gradual introduction of technological innovations at different levels of sophistication. Ghana's Electoral Commission has been successful in using technological innovations not only to improve on the delivery of quality electoral outcomes, but also to appease political tension since some of the proposals for technology adoption do come from political parties and Civil Society Organisations.

Finally, it is also clear the Electoral Commission attached much importance to technological innovations in implementing reforms. A cursory look at the over forty electoral reforms implemented shows that, over ninety percent were aided by technological innovations. This has eased the burden the manual methods of undertaking some of these electoral activities posed and made the processes faster and friendly. IIDEA (2006) supported this finding when it stated that, electronic systems serve the voter by making polling process easier and more transparent because they have a number of user friendly features. The application of technological innovations is thus central to the effective and efficient implementation of electoral reforms in Ghana. Table 2.1 provides a summary of the different technologies introduced as part of the electoral reforms efforts in the Fourth Republic.

Table 2.1: Summary of major technological innovations in electoral reforms in Ghana

S/no.	Item Description	Year Introduced
1.	Design of transparent ballot paper	1996 General Elections
2.	Re-design of ballot paper	1996 General Elections
3.	Introduction of photo and thumbprint ID card	1996 General Elections
4.	Optical Mark Readers and polaroid Cameras	1996 General Elections
5.	Networking Systems	2000 general Elections
6.	Carbonated Results Collation Forms	2008 General Elections
7.	Geographic Information System (GIS)	2008 general Elections
8.	Very-Small Aperture Terminal (V-SAT)	2008 General Elections
9.	Biometric System of Registration and Voting	2012 General Elections
10	Election Results Management System	2016 General Elections

Source: Author’s construct, 2016

2.6 Electoral Reforms and Democratic Governance



“Ghana has received praise for promoting “quality” democracy in Africa (Debrah, 2015:1).

Six successful, peaceful and relatively free and fair elections have been carried out, even though in the view of Debrah (2015) the founding election of 1992 produced a bizarre outcome. Two out of the six elections have produced power alternation in 2000 and 2008. By this standard according to Debrah (2015:1) “some pundits would even score Ghana’s democracy as firmly consolidated in the conceptual framework of Huntington”. All these elections have received legitimacy and overwhelming acknowledgement from different stakeholders including International Community and Domestic Election Observers.

Notwithstanding these laudable democratic achievements, Debrah (2015:1) stated that there is a general perception that the “electoral process has not been robust to instill voter confidence in the six general elections”. He added that concerns about failed electoral process have been loudly repeated in media commentaries and political platforms. The discourse according to him further exposed the sharp disagreements about the nature of the electoral system that has evolved since 1992. Stakeholders who criticised the electoral process identified institutional, procedural and technical weaknesses in the electoral processes.

The Electoral Commission in 1994 started the processes to reform the electoral process which Debrah (2015) observed was instigated by the elites. The Inter-Party-Advisory Committee (IPAC) was inaugurated to fashion new rules to direct the electoral process. Chiroro, (2008:7) observed that “changing electoral systems is no easy task, even in a stable democracy like South Africa”. Chiroro (2008) posits that electoral system reform movements are usually driven by the fragmentation of a dominant one party system, party alignments, and rampant political scandals or serious government failures. Examples of countries that have in the past few years embarked on electoral reforms are Japan, Italy and New Zealand. Chiroro (2008) added that all these countries prior to their reforms showed similar symptoms of failure of their political systems, including political corruption scandals, a high degree of public dissatisfaction and doubt regarding accountability and efficacy of the electoral system.

Lijphart (1994) made a distinction between the types of reforms when he argued that significant reforms that involve changes of the electoral formula or any change of at least 20 percent district magnitude, legal threshold or assembly size refers to a major reform. Lijphart refers to minor changes as those reforms involving marginal alterations. However, Katz (2007) disagreed with Lijphart (1994) when he argued that, there is no clear dividing line



between major and minor reforms; even more , there is no clear dividing line between reforms that might be considered minor and trivial. Thus from the forgoing arguments, Debrah (2015:2) observed “it may seem that any change in the (electoral) rules that leads to alteration in the operation of the electoral system connotes electoral reforms”.

A review of the literature reveals three distinct areas of electoral reforms, in each of which an Election Management Body and its stakeholders may play different roles (IIDEA, 2006:295).The first area of reform identified is the legal framework that governs the conduct of the election. Reforming the legal framework involves; amending the constitution, the specific laws regulating the elections and/or related regulations and rules to enhance the integrity, relevance and adequacy of the legal framework within which the Election Management Body delivers its electoral services. This kind of reform may include an institutional reform of the Election Management Body itself.

A second area is administrative reforms. With administrative reform, the Election Management Body introduces new strategies, structures, policies, procedures and

technological innovations that enable it to implement its legal responsibilities and deliver services more efficiently, effectively and sustainably (IIDEA, 2006). The third area of reform

is the political reform. These reforms may come about as result of changes taking place in the political environment within which an Election Management Body operates. These could result in making the Election Management Body more autonomous or creating a more effective and transparent framework for its funding and accountability.

However, questions are being asked are as to whether the introduction of electoral reforms does lead to the achievement of democratic good governance. It is a widely held view that,



when the electoral systems and processes is reformed, it could lead to the election of governments that strictly adhere to pure democratic tenants of governance. As a result, the need to refine the electoral system to enable it generate the requisite outcomes is increasingly coming under high demand and a permanent feature of many democracies across the world both old and new. The current study sought to unearth the impact of technological innovations on electoral reforms and good democratic governance using the mixed methods research which differs from the other studies.

2.6.1. Technological Innovations in Elections

The application of technological innovations have become trendy in the conduct of elections and its being applied at every stage of the electoral process including compiling voters register, drawing electoral boundaries, employing and training election officials, printing ballots and public education, as well as transmitting and publishing election results. However, some limited number of these innovations currently being used on a large scale or have the potential to be introduced in the coming years include Electronic Voting/Counting Systems, specifically Machine Readable, Vote Tabulation Systems, Direct Recording Electronic (DRE) systems; and Remote Electronic Voting, for example, via the Internet, Text Messages or Telephone.

There are at least three areas where there is a scope and utility for technological innovations to penetrate in the process of conducting elections; thus, the electoral roll; the electoral identity mechanism and; the actual polling mechanism. Of these three critical interfaces, perhaps technology penetration has been the most in all (Kumar and Silas, 2004).

Among countries that have adopted different types of technological innovations to reform their electoral systems are the Philippines, the United States of America, and India. Kumar



and Silas (2004:22) observed that “one of those applications in the electoral system of India is called the “Electronic Voting Machine”. This machine according to them is an interface, a facilitator between the voter and the voting process. On the African continent, Ghana is not the first country to apply technological innovations in its elections; countries such as Nigeria, Kenya and the Democratic Republic of Congo (DRC) have adopted the Fingerprint Scanning Technology to prevent electoral fraud. Like Ghana, these countries share a history of bloated Voter’s Registers and varying levels of disputes about election results.

The application of technological innovations in elections in Ghana is not limited to the Electoral Commission alone. Various observers groups, both Local and International, have started deploying different types of technological innovations in election observation. For instance in Ghana, the Coalition of Domestic Election Observers (CODEO) started the integration of technological innovations into its elections observation programmes since 2008. The results obtained by the Coalition through the deployment of technology include improved speed, accuracy and quality of its observation reports. CODEO did this by deploying a technology called the “Parallel Vote Tabulation” (PVT). This election observation methodology combines statistical sampling and text messaging technology to speed up the process of verifying election results, allowing the Coalition to receive results in good time.

Many types of technological innovations are still receiving substantial debate about their feasibility in elections. One such innovation is Internet Voting. Most experts argue that its introduction will greatly facilitate polling and that its adoption is a matter of course in the face of current technological developments and voter expectations. The United Kingdom Electoral Commission reports that the technological innovations in the May 2002 elections were well received by voters, who found electronic voting easy, convenient and quick to use (UK



Electoral Commission, 2002). However, the question of security came up strongly. A Caltech-MIT (2001) report argued that Internet Voting poses serious security risks because individuals such as hackers are able to interfere in the election processes. (California Institute of Technology and Massachusetts Institute of Technology, 2001).

The United Kingdom Electoral Commission disagrees with the Caltech-MIT on the issue of security when it argues that for electronic voting in general, the central issue is not security per se, but voter confidence. The United Kingdom Electoral Commission (2002) stated that although it did not observe any negative impact of its 2002 Internet Voting Pilots, it believes that public concerns about the possibility of fraud could reduce trust in the process and argues that it necessary to develop technical criteria that inform voters and also provide reassurance.

At a 3-day conference of the Association of African Election Authorities (AAEA) hosted by Ghana's Electoral Commission from the 21st to 23rd of July 2014 held in Accra on the application and sustainability of Biometric Technology in election management in Africa, the Electoral Commission chairman, Afari-Gyan explained that technology is used in election administration not as an end in itself but for several purposes like solving problems of efficiency, credibility, acceptance of results and managing large scale data such as voter registration data, production of ballots and logistical planning. He stated that, technology is used to compile election results and provide stakeholders with copies of data or details of results in a convenient manner whilst making information, data and results available on the websites to interested persons.

Afari-Gyan however noted that, as useful as technology could be to election administration, there was no doubt that the use of Biometric Technology came with risk right from the tender process, and in particular risk associated with maintenance and support in the field, storage,



preservation, and security of data and the sustainability of the entire system. Such risks according to him need to be mitigated by competent professionals at the very onset. He concluded that, the adoption of technology raised not only technical issues, but others like operational and legal challenges relating to the right of the voter, adding that it is also a moot question as to whether technology should entirely replace the human factor in elections, thereby precluding scrutiny by election officials, party agents, observers and the media (GNA,2014).

2.6.2. Technological Innovations and Good Governance

Technological innovations have become an important part of almost all aspects of human endeavour, both at the individual level and collectively as societies. The mobilisation of Information and Communication Technology (ICT) is deemed critical in fostering national competitiveness within the context of a rapidly changing global economy. As a result, since the mid-1980's, strategic efforts have been exerted by many countries to build their Telecommunication and Information Systems Infrastructures.

According to Bemile and Boateng (2011), the importance of Information and Communication Technologies lies less in the technology itself than its ability to create greater access to information and communication in underserved populations. Many countries around the world including Ghana have established institutions for the promotion of Information and Communication Technology, because the fear is that unless less technologically advanced areas have a chance to catch up, the increasing technological advances in developed nations will only serve to worsen the already existing economic gap between technological “have” and “have not” areas. As part of its development agenda, the United Nations actively promotes Information and Communication Technology as a means of bridging the digital



divide. Subsequently, various countries around the globe have embarked on massive deployment of technological innovations in such areas as agriculture, health, education and science

Technological innovations have a great potential of promoting good democratic governance through the use of e-governance. However, its introduction in the Public Administration System in most African countries including Ghana, particularly in the field of election administration is still in the early stages even though it has a long history. Teng-Zeng (2007) observed that at independence in 1957, the country has no dedicated Ministry responsible for science and technology and no policy to help with the institutionalisation of science as well as the co-ordination of scientific activities. He further observed that “soon after independence, some conscious efforts were made to organise, plan and to pursue science and technology development as a major instrumental component of overall national economic and social development”. Teng-Zeng stated that this process has not been smooth in most African countries. Citing the case of Senegal, he observed that “although Senegal recognises the centrality of modern science and technological innovation in the socio-economic development, creating the appropriate institution to promote the development and governance of science and innovation system has not been smooth just as in the case of most other African countries”. Although Ghana formulated the ICT for Accelerated national development policy its implementation was still at a nascent stage,

Recently, most of the fifteen member countries of the Economic Community of West African States (ECOWAS) have enjoyed expanded political freedoms and have passed a variety of reform measures to combat corruption, including the establishment of a Regional Anti-Corruption Institution. Despite this progress however, some countries in the West African



sub-region are still confronted with instability, limited transparency, and weak democratic governance. Ahiabenu (2013) stated that, in response to these challenges, West African countries have begun to harness the power of Information and Communication Technologies (ICTs), primarily as a tool to run elections.

In the arena of technology promoting good democratic governance, Ahiabenu (2013) argues that beyond their application in the electoral environment, the full potential of technological innovations to enable transparency, fight corruption, and monitor public service delivery has yet to be fully realised. Bemile and Boateng (2011) stated that eGovernance gave governments the chance to reinvent themselves, draw closer to the citizenry and forge closer alliances and partnerships with diverse communities of interest, practice expertise, conviction and inter-dependence within the context of national development agendas. The recent upsurge of interest in modern technological innovations can be harnessed to improve the efficiency and effectiveness of governance at all levels and in both formal and informal settings particularly in developed countries such as Ghana.



Technological innovations in the governance system create conducive ground for both negative and positive outcomes. With the presence of a myriad of online platforms, social media, and mobile phones, citizens are now offered the opportunity to connect with both elected and unelected public officials whose duty it is to deliver public services. In the view of Ahiabenu (2013:2) “this leads to improved information exchange which is required to enhance accountability, strengthen good governance, and ensure improvements in public service delivery”. Technology he argues further, do not only facilitate the typical government-to-citizen interaction, but more importantly, it promotes citizen to citizen, government-to-government, and citizen-to-government interaction, communications and engagement. It is

therefore more appropriate that the study attempts to assess technological innovations in electoral reforms and the promotion of good democratic governance in Ghana and Tamale Metropolis in particular using the mixed methods research approach.

2.6.3. Stakeholders and Technological Innovations

The acceptance of technological innovations in all fields of human endeavour has become a source of attraction to a lot of researchers over the past two or more decades. Chuttur (2009) posits that with growing technology needs in the 1970's, and increasing failures of systems of adoption in organizations, predicting system use became an arena of interest for many researchers. Chuttur (2009) held the view that, most of the studies carried out failed to produce reliable measures that could explain system acceptance or rejection by stakeholders. This study adopts the mixed methods research approach to assess technological innovations in electoral reforms and good democratic governance in Ghana and Tamale Metropolis in particular.

Elections administration in Ghana has witnessed several reforms. However, the successful introduction of most of the reforms was facilitated by the use of technological innovations.

The rate at which these technological innovations are embraced by stakeholders in elections particularly, Political Parties and Civil Society Organisations, go a long way to legitimize the credibility of elected officials and the outcome of electoral activities. Recognising the potential for technological innovations in enhancing electoral activities therefore, gave rise to calls from stakeholders on the Electoral Commission to continue to incorporate technological innovations into its activities.

The opposition New Patriotic Party supported by the Danquah Institute led the calls for the adoption of the Biometric System of Voter Registration and subsequent application of the



Biometric Verification Device during the 2012 general elections. Also prominent among Civil Society Organisations that joined the calls were the Ghana Centre for Democratic Development (CDD-Ghana), the Institute of Democratic Governance (IDEG) and the Institute of Economic Affairs (IEA). These calls on the Electoral Commission were grounded on the belief that technological improvements holds the potential in resolving some of the myriad of problems associated with elections and that stakeholders have come to accept its application as a panacea.

This position is supported by Davis (1985) when he stated that, user motivation in the application of any technological innovation can be explained by three factors: perceived ease of use, perceived usefulness and attitude towards using the system. Davis (1985) believed the attitude of a user toward a system is a major determinant of whether the user will actually use or reject the system. The attitude of the user in his view is considered to be influenced by two major beliefs: perceived usefulness and perceived ease of use, with perceived ease of use having a direct influence on perceived usefulness. Davis (1985) opined that both beliefs are directly influenced by the system design characteristics.

Other earlier studies on the acceptance of technological innovations by stakeholders were carried out by Bandura (1982) and Swanson (1982). Bandura (1982) study showed the importance of considering both perceived ease of use and perceived usefulness in predicting behaviour. He suggested that in any given instance, behaviour would best be predicted by both self-efficacy and, outcome judgements. According to him, self-efficacy was similar to perceived ease of use which he also defined as judgements of how well one can execute courses of action required to deal with prospective situations, whereas outcome judgements



which he equated to perceived usefulness was defined to mean the extent to which a behaviour once successfully executed is believed to be linked to value outcomes (Chuttur, 2009:4).

On his part, Swanson (1982) provided evidence that perceived ease of use and perceived usefulness were both important behavioural determinants. He further observed that potential users of technological innovations will select and use information reports based on trade-off between perceived information quality and associated cost of access. Swanson (1982) also concluded his study by equating information quality to perceived usefulness, whereas associated cost of access was found to be similar to perceived ease of use. In other words, stakeholders would tend to embrace particular technological innovations when they are strongly convinced that they stand to make the maximum benefit out of it. However, all these studies were undertaken using the qualitative research, the current study adopts the mixed methods research to assess the above variables.

2.7. Conclusion

This chapter has brought out why and how electoral reforms have become a permanent feature of the Ghana's electoral process. The successful implementation of electoral reforms heavily supported by modern technological innovations, has over the years renewed the confidence of stakeholders in the electoral process and therefore enabled the Electoral Commission to contribute to the advancement of Ghana's democracy through the institutionalisation of transparent, free, fair, and incontrovertible elections to the acceptance of all stakeholders. Given that electoral reforms are geared towards promoting credibility of the system, it is expected that the application of modern technological innovations in the electoral process will lead to improvements in the delivery of electoral services to stakeholders. The next chapter is chapter three; this chapter presents the research methodology employed in the study.



CHAPTER THREE

METHODOLOGY

3.1 Introduction

After a review of literature in the previous chapter, the following discussed the study area and the methodology that was used in the study.

3.2. Study Area

The study covers the Tamale Metropolitan Assembly Area which is one of the 26 districts in the Northern Region of Ghana. The Assembly was established under the Legislative Instrument (L.I.) 2068 of 2012 making it the only Metropolitan Assembly in the three northern regions of Ghana. It is made up of two sub-metros namely; Tamale South and Tamale Central sub-metros.

3.2.1. Location, Size and Physical Features

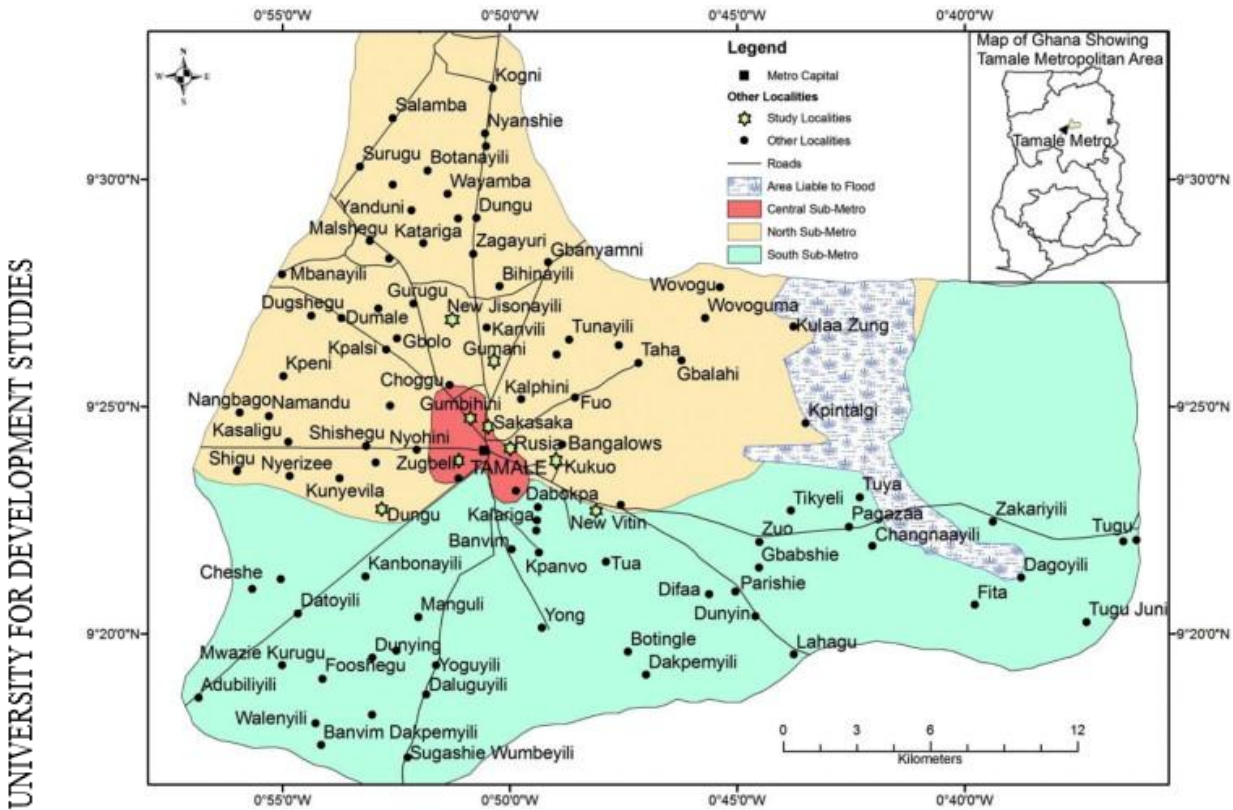
The Tamale Metropolis is located in the central part of the Northern Region and bounded by Sagnarigu to the north, Mion to the east, Tolon to the west, Central Gonja to the south west, and East Gonja districts to the south. Geographically, the metropolis lies between latitude 9° 16 north and 9° 34 north and longitudes 0° 36 and 0° 57 west. The Metropolis has a total estimated land size of 646.90180sqkm (GSS, 2014).

Tamale Metropolis is made up of a total of 115 communities, with most of the rural communities having large expanse of land for agricultural activities and thereby serving as the food basket for the Metropolis. However, most of these communities have a deficit in basic social and economic amenities such as good road networks, school blocks, hospitals, markets and recreational centres, thereby keeping in check; socio-economic development, poverty



reduction, reducing the general phenomenon of rural-urban migration as well as hindering the smooth administration of elections in these parts of the Metropolis.

Figure 3.1: Map of the Tamale Metropolis (2014)



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Source: Science Direct (2014)



3.2.2. Population Characteristics

Data from the 2010 Population and Housing Census shows that the Tamale Metropolis has a population of 233,252, which represents 9.4 percent of the region's total population. The data indicates that males constitute 49.7 percent whilst females made up 50.3 percent of population. The report also shows that population of the Metropolis living in urban localities is 80.8 percent higher than that living in rural localities which constitutes only 19.1 percent.

The District Analytical Census Report for 2010 for the Metropolis also indicates a sex ratio of

99.1, dominated by a youthful population constituting 36.4 percent of below 15 years, depicting a broad base pyramid which tapers off with a small number of elderly persons (60 years and older) representing 5.1 percent. This gives an estimated potential voter population of about 60 percent. The total age dependency ratio for the Metropolis stood at 69.4 percent, while rural localities records higher dependency ratios of 86.5 percent, the urban localities records 65.7 percent (District Analytical Report, 2014)

3.2.3. Ethnicity and Socio-Cultural Values

The Tamale Metropolis, just like other parts of the three Northern Regions, covers a vast land area. However, the area begun to experience a population boom when many people from different ethnic groups from far and near started migrating to settle there, thereby giving it a cosmopolitan status. Based on the 2010 population and housing census data, the Dagombas are the majority and other groups such as the Gonjas, Mamprusis, Akan, and Dagaabas as well as ethnic groups from the Upper East Region also reside in the Metropolis. Due to the economic activities and others such as educational infrastructure and international organisations operating within the Metropolis, it has also become a hub for other African nationals and many from across the globe.

3.2.4. Political and Administrative Structure of the Metropolis

As provided for in the Local Government Act, 1993, Act 462, the Metropolitan Chief Executive is the political head of the Tamale Metropolis. The Metropolis is made up of three Parliamentary Constituencies, thus Tamale South and Tamale Central. As earlier stated, the Metropolis has two Sub-Metropolitan structures which includes; Tamale Central Sub-Metro, which is headquartered at Kaladan, off the Aboabo-Nyohini road, and the Tamale South Sub-Metro with its office located at Banvin, off Lamashegu-Vittin ring road. The two Sub-Metros



are made up of three Town Area Councils (TACs) namely, Vittin, Lamashegu, and Sabunjida. However, until recently, these decentralised structures were not operational. Their operationalization and effective functioning started during the first quarter of 2010. The Assembly is therefore made up of forty one (41) elected members and eighteen (18) appointed members.

For effective local governance and election administration, the Tamale South Constituency is divided into twenty three (23) Electoral Areas with a total of 128 Polling Stations (PS) and figures from the Electoral Commission put the current Voter Population for the constituency at 90890 as at August 2014 (EC, 2014) . The Tamale Central Constituency is also divided into eighteen (18) Electoral Areas/Unit Committees, one hundred and one (111) Polling Stations and a current total Voter Population of 80,236 (EC, 2015).

In sum, the Tamale Metropolis has a total of forty one (41) Electoral Areas/Units, Two Hundred and Thirty Nine (239) Polling Stations and current registered voters of 233,252, making 78.5 percent of the total population of the Metropolis. Since the return to democratic

elections in 1992, the Tamale Metropolis has become a hot bed for political activities especially among the two main political parties of National Democratic Congress (NDC) and New Patriotic Party) (NPP). There have been intermittent disturbances during elections within the Tamale Metropolis where the electorate expressed their dissatisfaction over political and electoral matters. Such agitation has fostered a relatively high level of mistrust and suspicion between the youth and elections administrators, a development that undermine effective application of technological innovations in the introduction of electoral reforms within the Metropolis.



3.3. Research Strategy

The choice of a right research strategy in any study goes a long way to determine its quality and accurateness (Denscombe, 2010:3). The concept of strategy has its origin within the military, relating to the role of generals in their broad overview of operations. The application of strategy in social science research however retains some of the essentials components which require an overview of the whole project that uses “the bigger picture” as the basis for deciding how to approach the research. There is no gainsaying however, that, where there is a carefully constructed plan of action that is rationally designed and likely to offer the best prospects of success and a specific achievable identified goal, knowledge is contributed through research. It is argued that, there is no single strategy that can be recommended as the best in all circumstances. In order to decide which strategy is likely to work best, the researcher needs to consider three key questions thus; is the strategy suitable; is it feasible; and is it ethical? When all answers to these questions might point to a particular strategy, then, clearly, that strategy stands out as the most suitable for the task at hand.

3.3.1. Research Design



Given its adoption of the scientific approach, research designs tend to employ well designed structures that are ordered logically. In the opinion of Twumasi (2001:15) a research design is a “set of theoretical ideas, hunches or clearly defined concepts to direct the scientist in his research operations”. Malhotra and Birks (2007) observed that, a research design is the framework for conducting research. It spells out in clear terms the necessary procedures for obtaining the information needed to solve a research problem. Blanche and Durrheim (1999) also stated that a research design serves as a bridge between research questions and the execution of the research. From the foregoing, one thing that is clear is that the kind of results

expected from a research can be seen in the design. In other words, a poorly designed research would produce substandard results which would lack the ability to solve the research problem.

The study adopted a multiple-sample survey design in the case of the quantitative approach and a case study in the case of the qualitative approach. Unlike in the case of conducting census of the population where every single unit of the target population is included in the study, a sample survey helps the researcher to take a part of the population and use it to make generalisations for the entire population. Indeed, surveys have emerged in recent times as one of the most popular and commonplace approaches to social research (Denscombe, 2010).

Social surveys share with their physical counterparts three crucial characteristics; wide and inclusive coverage, which refers to the fact that implicit in the notion of “survey” is the idea that the research should have a wide coverage; the second characteristic is that, at any specific point in time, surveys provide a snapshot of how things are at the time; and finally, survey works involve empirical research, which implies the idea of getting out of the chair, going out of the office and purposefully seeking the necessary information “out there”. And that is exactly what this researcher did.

The usefulness of surveys are seen in instances where the researcher is interested in factual information relating to groups of people especially in trying to answer questions such as; what they do; what they think; and who they are. However, its usefulness goes beyond the above. Indeed, its popularity among social researchers reflects the particular strengths of the survey approach. The survey approach works best with clear and narrow targets in terms of the information it tries to gather (Denscombe, 2010).



In other words, the survey approach of conducting studies lends itself to dealing or handling only specific issues especially when the researcher knows in advance precisely which factors are important and the kind of information required. Surveys are also very useful for linking findings with specific social classes such as age groups, sexes and ethnic backgrounds and are often seen in studies such as opinion polls and voter behaviour, consumer preferences and customer satisfaction, health related behaviour, diet, smoking and alcohol consumption among others.

However, the survey approach is not without limitations. When it comes to research on sensitive and complicated matters, surveys do not lend themselves so well to studying issues in depth or testing out the intricacies or subtleties of certain social life. In fact other research approaches prove more valuable than the survey approach.

The use of samples also comes with its own challenges; important among these is how to determine a representative sample. Better results can be obtained when the sample size is representative enough. The basic principle of sampling is that it is possible to produce accurate findings without the need to collect data from each and every member of the “survey population”.

Finally, the choice of the survey design has guided the selection of methods, techniques and tools for data collection and analysis. Tools selected for the field work were pre-tested to determine their appropriateness for gathering the data that is required to address the research problem.

With regards to the use of the case study, Denzin and Lincoln (2003:124) state that a case study is a “Systematic inquiry into an event or a set of related events which aims to describe



and explain the phenomenon of interest. Case studies offer a multi –perspective analysis in which the researcher considers not just the voice and perspective of one or two participants in a situation, but also the views of other relevant groups of participants and the interaction between them. It opens the possibility of giving a voice to the powerless and voiceless, like children or marginalized groups.

Donna (2001:1) explains that case study is a systematic inquiry into an event or a set of related events which aims to describe and explain the phenomenon of interest. The key features of a "case study" are its scientific credentials and its evidence base for professional applications.

The case study approach was particularly appropriate in this study because it gave the researcher the opportunity to select focus group members and interviewed them to get more information on technological innovations in electoral reforms and good democratic governance in Ghana on stakeholder perspectives from Tamale Metropolis.

3.3.2. Methods

The study adopted the mixed methods research technique in a single study. This enables the researcher to rely on both open and close-ended questions as well as Focus Group Discussions (FGD) in the data gathering stage. Mixed methods research comes with philosophical assumptions and methods of inquiry. Viewed as a methodology, it provides philosophical assumptions that direct the collection and analysis of data and the mixture of qualitative and quantitative approaches in many phases of the research process. Also when considered a method, its primary focus is on collecting, analysing and mixing both quantitative and qualitative data in a single study or series of studies. Quantitative data includes closed-ended information such as that found on attitude, behaviour or performance instruments (Creswell, 2009). Flick (2002) in comparing the two methods, argued that, quantitative research is



research conducted using numbered data. It follows a linear sequence of empirical and methodological steps. It is formal and rule-based, and implies a limited cause-effect relationship free of context.

In contrast, Creswell (2009) stated that, qualitative data consist of open-ended information that the researcher obtains through interviews with respondents. These kinds of questions allow respondents to supply answers in their own words. Flick (2002) posits that the qualitative approach is more subjective, it assumes that, the researcher must interact with the subjects of the study. It is less formal and can be expressed in words, pictures and objects. In a mixed method research, the work did not end with simply collecting and analysing quantitative and qualitative data, they need to be “mixed” in some way so that they form a more complete picture of the problem than they do when standing alone.

Creswell (2006) provided three methods of mixing dataset in a mixed method research. These are: merging or converting the two datasets by actually bringing them together; connecting the two datasets by having one built on the other; and embedding one dataset within the other so

that one type of data provides a supportive role for the other dataset. Bryman (2007) observed that the fundamental issue of the degree to which mixed methods researchers genuinely integrate their findings has not yet been addressed to a significant extent. In other words, what depth do mixed methods researcher goes in analysing, interpreting and writing up their research in such a way that the quantitative and qualitative components are mutually illuminating? This study mixed the two datasets of qualitative and quantitative by embedding them.

The mixed methods research comes along with a number of solutions to problems that either method pose when standing alone. Mixed method research provides more comprehensive



evidence for studying a research problem than either quantitative or qualitative alone. In this approach, the research has at his disposal all the tools of data collection available rather than being restricted to one type either associated with quantitative or qualitative research.

The mixed methods research offsets the weaknesses associated with either method used alone. For instance, the quantitative method is deficient in providing an understanding of the context within which the respondents talk. On the other hand, the qualitative method is seen to be defective because of the researcher's personal interpretations or biases. A combination of the two approaches can offset the weaknesses of either approach (Creswell, 2006). It is also argued that the mixed method research encourages the researcher collaborate across the sometimes adversarial relationship between quantitative and qualitative researchers.

3.3.3. Target Population

The target population for the questionnaire survey in this segment of the survey consisted of both male and female registered voters within the Tamale Metropolis who have taken part in at least two general elections. The reason for the selection of this category of respondents for the study was the assumption that they would have had some form of interaction with technological innovations used at different levels and times in the electoral process.

3.3.4. Sample Frame and Sample Size Determination

Leedy and Ormod (2010:213) have identified the following guidelines for selecting a sample size, which is referred to as the symbol N:

- For smaller population, say, $N=100$ or fewer, there is little point in sampling; survey the entire population.
- If the population size is around 500 (give or take 100), 50% should be sampled.



- If the population size is around 1,500, 20% should be sampled.
- Beyond a certain point (about N=5,000), the population size is almost irrelevant and a sample size of 400 will be adequate.

The sample and the sample size of this study was based on the fourth and the last guideline above which is suggested by Leedy and Ormod (2010:213), because the Electoral Commission of Ghana (2016) reported that the total number of registered voters for the Tamale Metropolis as at the end of the limited voters registration exercise embarked on in 2016 is 183,111. This is made up of both male and female voters who have voted in at least two general elections. The study considered this the sample frame for the questionnaire survey.

Derek (1997) stated that sampling or the use of samples is a potentially complex business with many traps for the unwary. In simple terms, the use of samples is basically the obtaining of a manageable part of the population that supposedly possesses the same qualities as a whole.

The use of large sample size in a research study especially in terms of polling for opinion or gauging the perception of a population on a particular subject using questionnaire can ensure accuracy and also allows for segmentation of the data into such segments as women, men, young or old which may be required for an in-depth research into the data set so that you know what certain people are thinking about the subject under study.

3.4. Sampling Techniques

The selection of a sampling technique depends primarily on the nature of the study, its objectives and the availability of other logistics (Hair et al, 2007). The sampling techniques that were employed in the data collection include: cluster, purposive and snowball sampling techniques. These are both probability and non-probability sampling techniques and their



choice is informed by nature of the target population which is focus on voters who have at least voted in two general elections.

3.4.1. Cluster Sampling

Firstly, the cluster sampling technique was used to put the Metropolis into clusters; namely; Tamale South and Tamale Central Constituencies. Cluster sampling refers to a method that is used when natural groups are seen in a population. Here the population is separated into smaller clusters and then a sample is taken from the group for analysis. This technique offers a practical manner of sampling large numbers of population. In fact, without cluster sampling compiling certain research data could be unachievable. With large populations, using other sampling methods would both be hard and expensive. Cluster sampling therefore provides practicability when the research involves large numbers of people whilst also ensuring increased variability with regards to results.

Nevertheless, despite the merits of cluster sampling, it came with certain drawbacks. For instance researchers who are not so conversant with are discouraged from using it because of the many errors associated with it. Other probabilistic sampling techniques provide lesser errors as compared to cluster sampling.

3.4.2. Purposive Sampling

The study employed purposive sampling in selecting fourteen (14) Temporal Electoral Commission Staff in only seven of the forty-one (41) different Electoral Areas for the data collection. Purposive sampling operates on the principle that we can get the best information through focusing on a relatively small number of instances deliberately selected on the basis of their known attributes and not through random selection. With purposive sampling, the sample is ‘hand-picked’ for the research on the basis of relevance, thus to the issue or theory



being investigated and; knowledge, meaning privilege knowledge or experience about the topic. Purposive sampling is use to ensure that a wide cross-section of items or people is included in the sample. When purposive sampling is use in this manner, is to a degree, emulating a representative sample. Based on prior knowledge, the researcher can deliberately select the sample in order to ensure that the full range of items or people get included (Denscombe, 2010)

The issues of sampling tend to characterise the entire life span of the research process. Flick (2002) posits that, in an interview study, it is connected to the decision about which person to interview (case sampling) and from which groups these should come (sampling of group cases). Flick (2002), observed that the trend could continue to emerge in even deciding which aspects of the sample to subject to further testing or treatment, thus, transcribe and interpreted, to the presentation of research finding; the decision has to be made about which cases or parts of the text that is best and can be used to demonstrate the final findings.

The two constituencies are made up of a total of forty one (41) Electoral Areas and a total of two hundred and thirty nine (239) polling stations. The purposive sampling technique was used to select twenty (20) Electoral Areas from the forty one (41) Electoral Areas within the two constituencies. The sampled Electoral Areas/Units Committees are; Pagazaa/Tingu, Gumbihini, kobilmahigu, Zogbeli, Builpela, Worizehi, Moshie Zongo, Tuntingli, Nakpazoo, Changni, Wamale, Teshegu, Lahagu and Lamacara

3.4.3. Snowball Sampling

Snowball sampling technique was employed to select twenty (20) registered voters who have taken part in two general elections from the sampled twenty (20) Electoral Areas which then gave a sample size of four hundred (400) for the study. Snowball sampling which is popularly

referred to as a chain referral sampling is a method that has been widely used in qualitative sociological research (Biernacki and Waldorf, 1981). The method provides a study sample through referrals made among people who share or know of others who possess some characteristics that of research interest. Coleman (1958) argued that it is a method uniquely designed for sociological research because it allows for the sampling of natural interactional units.

In other words, with the snowball sampling, the sample emerges through a process of reference from one person to the next. At the start, the research can involve just one or a few people. Each can be asked to nominate some other people who will be relevant for the purpose of the research. These nominations are then contacted and included in the sample. The sample then snowballs in size as each of the nominees is asked, in turn, to nominate further persons who might be included in the sample. For each of the twenty (20) Electoral Areas that were purposive sampled, the snowballing method was used to sample twenty (20) registered voters who have taken part in at least two (2) general elections.

3.5. Instruments for Data Collection



The instrument that was used to collect data in this study was the questionnaire (Appendix A) and the focus group interview checklist (Appendix B).

3.5.1 Questionnaire

The use of the questionnaire was based on the assumption that “no survey results can be better than the questionnaire used in the data collection”, the quality of the questionnaire for the study is of great importance to the researcher. The questionnaire was used to collect data on the following variables:

- The acceptability of technological innovations in electoral reforms,
- The capacity of the Election Management Body,
- The appropriateness of the technological innovations
- Ease of use by stakeholders and,
- Calibre of temporal staff employed by the election management body.

Primary data was collected mainly through the use of questionnaires for interviews. Given the fact that the study was adopting the mixed methods research approach, both open-ended and closed-ended questions were embedded in the questionnaire in order to enable it come out with both the required qualitative and quantitative data needed to address the research questions.

There were structured and unstructured questions. The structured questions were not allowed for much improvisation, and questions of this nature are often used when the objective is to test a theory. However, if in the process, further clarification is required of a given answer, it

is permissible that another set of questions are prepared and a follow-up interview conducted.

Meanwhile, by so doing, it is also possible to investigate whether the opinions of the interviewee has changed with time by carrying out a longitudinal series of interviews.

Unstructured questions were embedded in the questionnaire to allow the interviewer to probe around the interviewee responses in order to glean some more information. It must be observed, for any questionnaires to qualify for research, it should exhibit some basic characteristics. These include: first, it should be designed to collect information which can subsequently be used as data for analysis; it should also consist of a written list of questions

and; finally, it should be able to gather information by asking people directly about the points conceived with the research.

3.5.2. Focus-Group-Discussion

Another instrument that was employed is Focus-Group-Discussion (FGD). There were two group discussions made up of smaller of seven participants to a group. The aim was to ensure effective moderation of these groups in order to get the best out of them. Due to the problems usually associated with keeping people from diverse backgrounds for long, a maximum period of one hour was given to each group deliberation.

Morgan (1997) opined that focus groups can serve as a primary means of collecting qualitative data. Focus groups are mostly unstructured interviews where interviewees are free to interact with each other and that the facilitator must motivate and consider all members of the focus groups and encourage even the quiet ones to contribute, or even adopting the interventionist style to get information out of the discussants. Data obtained from the Focus-Group-Discussions was analysed by coding and has the potential for quantification just as is done in other methods.

Purposive sampling technique was used to select members of the group. The reason is to ensure that participants represent a section of the target population of the study that have adequate knowledge and experience on the field of technological innovations and its application in electoral reforms.

Unstructured interviews questions were used where the researcher motivated and considered all members of the focus groups and encouraged the quiet ones to also contribute. The interviews lasted for 60 minutes.



3.6. Pre-Testing Of Instruments

Instruments for data collection were subjected to pre-testing. This section of the study involved samples from the different categories of respondents. Thirty (30) registered voters who had voted in at least two general elections from the Sagnarigu District were been selected through the snowballing sampling technique for the instrument testing stage.

Analysing the preliminary study provided useful clues for fine-tuning of the instruments through the elimination of irrelevant questions; reframing, re-arranging and adding on to the questions to give the instruments some amount of validity and vitality; make them more reliable and above all ensure consistency in the instruments.

3.7. Data Collection Procedure

Before field data collection in each of the questionnaire administration and in the focus group discussions, a letter of introduction was obtained from the Dean, Faculty of Integrated Development Studies. This letter gave the researcher's access, support and co-operation from the institutions where data was collected. There were ten Research Assistants who were trained by the researcher on the use of the instruments for the data collections. These Assistants were given clear guidelines on how to explain the rationale of the study to the respondents before leaving the questionnaire for completion as well as making arrangements to pick-up the completed questionnaire at a later date for questionnaires that were self-administered. However, in an event where a respondent fail to return a questionnaire, different questionnaire was given out if the respondent agree to provide answers to the research questions.

However, key personalities such as assemblymen or unit committee members within the electoral areas were contacted for permission before entry into the community. The purpose



and mission of the research team were explained to these personalities and their support sought. Then afterwards, the research team proceeded to collect data from the registered voters using the snowball sampling technique and also assuring respondents that the information so provided would be treated with confidentiality.

3.8. Data Analysis

The Statistical Package for Social Sciences (SPSS) and Excel 2007 were used to analyse the field data. The choice of these packages was primarily informed by their suitability as tools for social science research data analysis and the researcher having some considerable knowledge in these applications coupled with the assurance of adequate support from experts and their availability.

As earlier stated, the study adopted the mixed methods research. The data lend itself to all the available tools for analysing and interpreting mixed methods research data. Descriptive statistical techniques such as frequency tables and cross-tabulations as well as inferential techniques were employed. Excel 2007, which the researcher is more conversant with, was employed to present some charts, whilst SPSS was used to generate statistical tables.

In the case of the Focus-Group-Discussions, collected data was thematically analysed where raw data was set into meaningful segments and coded into categories. Related categories were then grouped into patterns and emerging scanned (MacMillan & Schumacher, 2010).

3.9. Conclusion

The chapter has revealed a close relation between the physical features of the study area, the phenomenon that is under study and most importantly the study design, the methodology

adopted as well as the tools that are used in the study. A combination of all these factors made the study topic worthy of contributing already existing knowledge in the field.

The next chapter is chapter four; this chapter will present the data analysis and the discussions of the findings.



CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter presents the data and analysis of the study based on the set objectives. Under each section, the data presentation is followed by the analysis according to the study objectives.

4.2: Demographic Information of the Participants

The presentation of analysis starts with the demographic information of respondents which is segmented into registration status, participation in two elections, sex, age and highest educational qualification of respondents.

4.2.1. Registration Status of Respondents and Participation in Two Elections

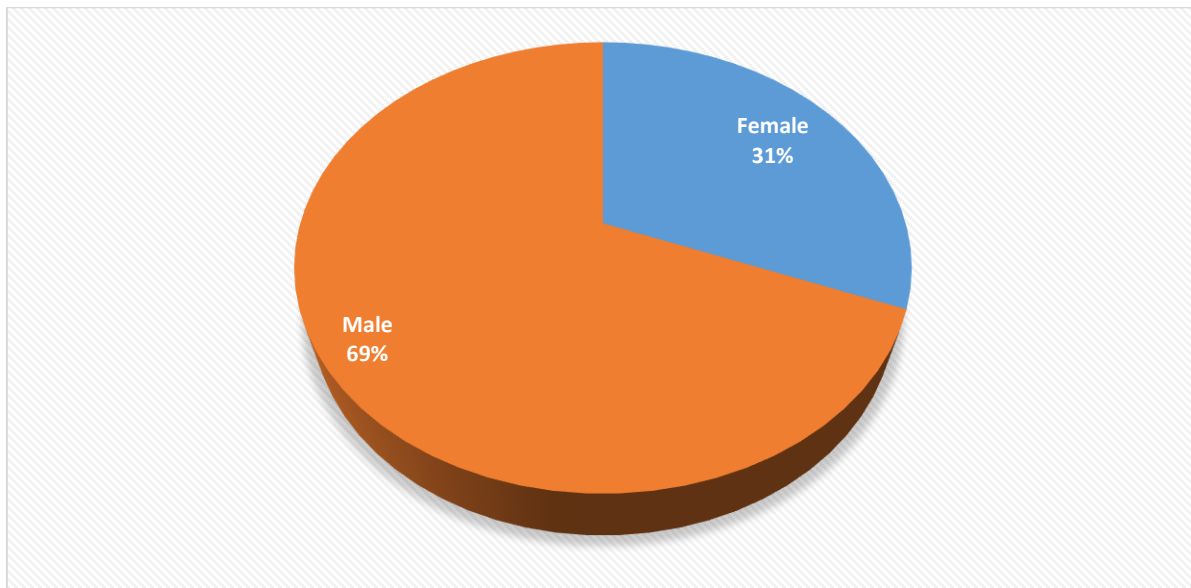
The study revealed all respondents (100%) were registered voters and has taken part in two elections.

4.2.2. Gender

This section brought out the sex distribution of respondents who took part in the study which is shown in the diagram below.



Figure 4.1: Sex Distribution of Respondents



Source: Field Survey, September, 2016

Figure 4.1, above indicates that 69% of respondents were males, while 31% were females sampled for the study.

4.2.3: Age of Respondents

The age of respondents is very crucial to the study because the electoral laws of Ghana have an age that qualifies a citizen to be registered as a voter and take part in elections.



Table 4.1: Age of Respondents

		Frequency	Percent	Valid Percent
Valid	18-30	126	31	31
	31-45	260	65	65
	46-64	13	3	3
	65 above	1	1	1
Total		400	100	100

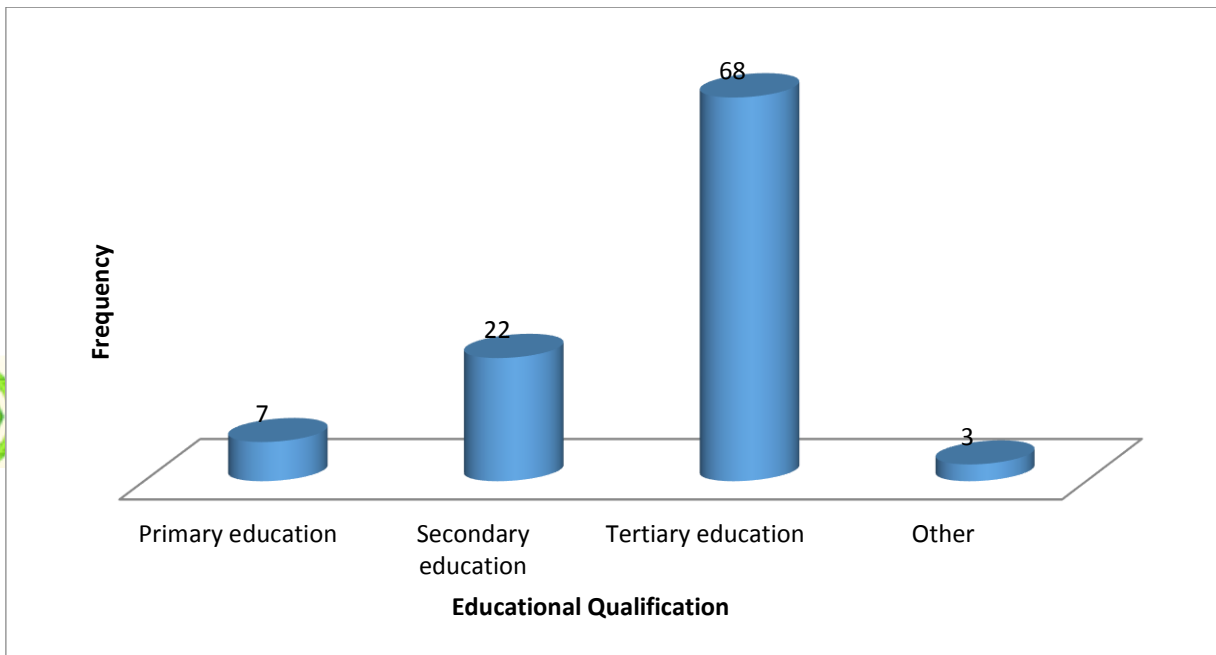
Source: Field Survey, September. 2016

Table 4.1 reveals 31% of respondents fall within the age brackets of 18-30, 65% are between the age group of 31-45, 3% of were within the age category of 46-64, whilst 1% is above the age group of 65years.

4.2.4: Educational Qualification of Respondents

The educational qualification of respondents in any study goes a long way to determine the quality of data that is collected for the research. The figure below shows the distribution of educational qualification of respondents. Figure 4.2, it shows that 7% of the respondents had primary education, 22% had secondary education, 68% had tertiary education and 3% had other forms of education.

Figure 4.2: Highest Educational Qualification



Source: Field Survey, September, 2016



4.3. Objective One: Trajectory of Technological Innovation in Electoral Reforms

The aim of this objective was to assess whether the electoral have any knowledge or ideas of the technological innovations the Electoral Commission has been using in the introduction of electoral reforms. Below is the presentation and analysis of the responses.

Table 4.2: Use of Technological Innovations by Electoral Commission

		Frequency	Percent	Valid Percent
Valid	Yes	286	72	72
	No	114	28	28
	Total	400	100	100

Source: Field Survey, September, 2016

Table 4.2, above indicates that, 72% of respondents had an idea that the Electoral Commission has been using technological innovations in the implementation of electoral reforms, while 29% had no idea about these applications electoral reforms.

4.3.1. Use of Laptop Computers at the Polling Station during Registration

This sought the views of respondents on whether any form of interaction with laptop computers during their visit to the polling stations. The table below shows the responses.

Table 2.3: Laptop Computers seen at the Polling Stations

		Frequency	Percent	Valid Percent
Valid	Yes	300	75	75
	No	100	25	25
	Total	400	100	100

Source: Field Survey, September, 2016

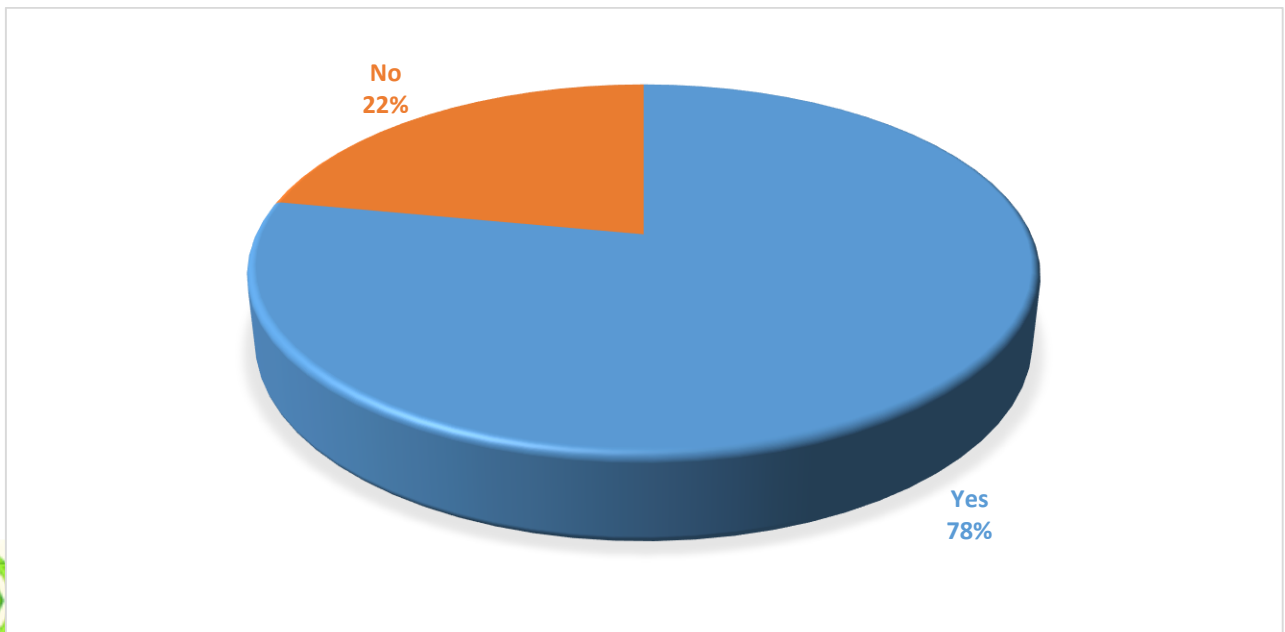


Table 4.3 above shows that, a significant number of the respondents representing 75% had seen laptop computers at the polling stations, while 25% indicated they have not seen them.

4.3.2: Use of Fingerprint Scanners at Polling Stations during Registration and Voting

The fingerprint is one of the technological innovation uses during voter registration at the polling stations to capture the bio-data of voters. The figure below indicates the respondents who know about it.

Figure 4.3: Finger Print Scanners Scanner at Polling Stations



Source: Field Survey, September, 2016

Figure 4.3 above shows that a significant 78% of respondents had seen Fingerprint Scanners at the polling station, while 22% indicated they have not seen them.

4.3.3. Use of Printers at Registration Centres during Voter Registration

This section assesses the knowledge of electorate of the use of printers at polling stations.

Table 4.4: Printers at the Registration Centres during Registration

		Frequency	Percent	Valid Percent
Valid	Yes	315	79	79
	No	85	21	21
Total		400	100	100

Source: Field Survey, September, 2016

Table 4.4, above shows quite a significant 79% of respondents indicating seeing printers at the Registration Centres, while 21% had not seen printers at the Registration Centres.

4.3.4. Use of Cameras at the Registration Centres during Voter Registration Exercise

Another important technological equipment use during voter registration is camera. This section sought the views of respondents if they have had any form of contact with it the registration centres. Below are the responses;

Table 4.5: Cameras at the Registration Centres

		Frequency	Percent	Valid Percent
Valid	Yes	315	79	79
	No	85	21	21
Total		400	100	100

Source: Field Survey, September, 2016

Table 4.5 above also shows 79% of respondents indicated that the cameras used to take their pictures for the issuance of their voters identification cards at the Registration Centres, while 21% said they have never seen cameras at the Registration Centres.

4.3.5. Use of Biometric Verification Devices at the Polling Station during Registration and Voting

Effective voter identification is a necessary condition for the conduct of any free, fair and incontrovertible election. The Electoral Commission as part of its measures to improve the electoral process and make the outcome of its elections acceptable to stakeholders introduced the biometric verification device to facilitate the easy identification of voters. This section assesses the knowledge of respondents on these devices at the polling stations.

Table 4.6: Biometric Verification Devices at Polling Stations

		Frequency	Percent	Valid Percent
Valid	Yes	327	82	82
	No	73	18	18
	Total	400	100	100

Source: Field Survey, September, 2016

Table 4.6 above shows that a significant 82% of respondents had seen the Biometric Verification Device at the polling station during voting, while 18% indicated they have never seen them.

4.3.6. Effectiveness of Technological Innovations in Electoral Reforms

The effectiveness of technological innovations in electoral reforms was assessed in this section and the table below shows the responses



Table 4.7: Effectiveness of Technological Innovations

		Frequency	Percent	Valid Percent
Valid	Yes	279	70	70
	No	121	30	30
	Total	400	100	100

Source: Field Survey, September, 2016

In the above Table 4.7, it shows that two 70% of the respondents believed the technological innovation so far deployed in the implementation of electoral reforms have helped to improve the electoral process, while, 30% thought they have not helped in the implementation of electoral reforms and therefore have not improve the electoral process.

4.3.7. Analysis of Key Findings of Trajectory of Technological Innovations in Electoral Reforms

With reference to objective one, the aim was to assess whether the electorate had any idea of technological innovations the Electoral Commission was deploying in the implementation of electoral reforms. The study found that electorates have been following developments within

the electoral process in particular the kind of technological equipment they see at the various Registration Centres and Polling Stations. Among some of the equipment voters said they saw at the Centres were Laptop Computers, Fingerprint Scanners, Cameras, Biometric Verification Devices among others.

Between 72% and 82% of respondents observed that they have encountered the above mentioned technological devices at both Registration Centres and Polling Stations during Voter Registration and actual Voting. Respondents indicated that these devices were seen in their right quantities at the Centres. The study also revealed that the deployment of some of



these innovations were a result of agitations from stakeholders particularly the electorate. It was also found that the technological innovations so far deployed in the implementation of electoral reforms have helped to improve the electoral process in Ghana since a significant number of respondents (70%) believed the system has recorded some improvement since the Electoral Commission started deploying technological innovations.

This finding agrees with the Technology-Organisation-Environment Framework which basically guided the study. The environment context according to the framework is the arena surrounding the organisation and this is where the electorate belongs. According to Angeles (2013) stakeholders in this context can support or block technological innovations. They study revealed that the electorate has supported have expressed satisfaction in the innovations and also believed that there is a high level of security guarantee in technological innovations

Young (1993) assertion that elections in Ghana have assumed an important place in the lives of the people even though its administration is not without some challenges also supports this finding. According to Young (1993), a long time ago there has always been a great deal of electoral behaviour in Africa. However, it is the quality of these elections being turned out that leaves much to be desired, hence, the need for electoral reforms.

The above findings have been confirmed by the International Institute for Democracy and Electoral Assistance (IIDEA, 2006), when it states that electoral reforms may enhance the independence of the Election Management Body (EMB) and thus promote better service delivery. IIDEA, (2006), further observed that electoral system reforms places a substantial information responsibility on the Elections Management Body, and may require it to implement new methods of electoral boundary delimitation, voting, and vote counting.



However, these electoral activities are now being execution with the aid of technological innovations specifically designed for the purpose.

According to Kumar and Silas (2004), the use of technological innovations in electoral systems reforms was embraced several years back globally. Technology has always been and is still being utilized in elections; however, recent advances have made its use more widespread and prominent. Over the past twenty five years, Election Management Bodies (EMB's) and lawmakers around the world engaged in electoral reforms incorporate technological innovations in the electoral process. One important but fairly new and interesting area of technology application is in electoral system reforms.

According to the former deputy chairman of the Electoral Commission, Kangah (Interview, 2015), *“the introduction of Transparent Ballot Boxes in the 1996 General Elections after the disputed Elections of 1992 raised the confidence and trust of stakeholders and they went into the elections with the belief that the Commission was addressing their concerns”*. Kangah however cautioned that *“the ultimate solution to the problems that bedeviled elections in Ghana should be vigilance on the part of Political Party Agents and not the mere deployment of technological innovations”*.

The focus group, discussants highlighted technological innovations been used by the Electoral Commission in the implementation of its programmes which included: Biometric Voter Registration Kit, Biometric Verification Devices, Voter Management System, Laptops, Finger printer Scanners, Projection of Constituency Collation Centre (CCC) Results, Interactive Electoral Commission Operations Centre, the National Collation Centre, Election Results Management System, Telecommunication, Radio, Social Media and the Internet (September, 2016). One discussant indicated that *“Ghana has achieved democratic consolidation and all*



political actors seem to be willing to play by democratic rules”. Another discussant also held the view that *“the Electoral Commission is now in a better position to deliver acceptable elections overtime due mainly the adoption of technological innovations anytime steps are taken to reform the electoral process”*.

With reference to the above findings on electoral reform in Ghana, Chiroro (2008) observed that changing electoral systems is not an easy task even in a stable democracy like South Africa. She argues that electoral system reform movements are usually driven by the fragmentation of a dominant one party system, party alignments, rampant political scandals or serious government failures. Chiroro (2008) gave examples of countries that have in the past few years embarked on electoral reforms as Japan, Italy and New Zealand and added that all these countries prior to their reforms showed “similar symptoms of the failure of their political systems, including political corruption scandals, high degree of public dissatisfaction and doubt regarding accountability and efficacy of the electoral system (Chiroro, 2008).

4.4. Objective Two: Calibre of Human Resources Involved in the Use of Technological

Innovations in Elections

The adoption of technological innovations in organisations either succeeds or fails. In a study by Jones (2004), he attributed the ineffective use of ICT to lack of confidence among workers. This section sought the perceptions of respondents on the calibre of human resources the Electoral Commission has been engaging to handle these innovations.



Table 4.8: Competence of Temporal Staff in Technology Use

		Frequency	Percent	Valid Percent
Valid	Yes	271	68	68
	No	129	32	32
Total		400	100	100

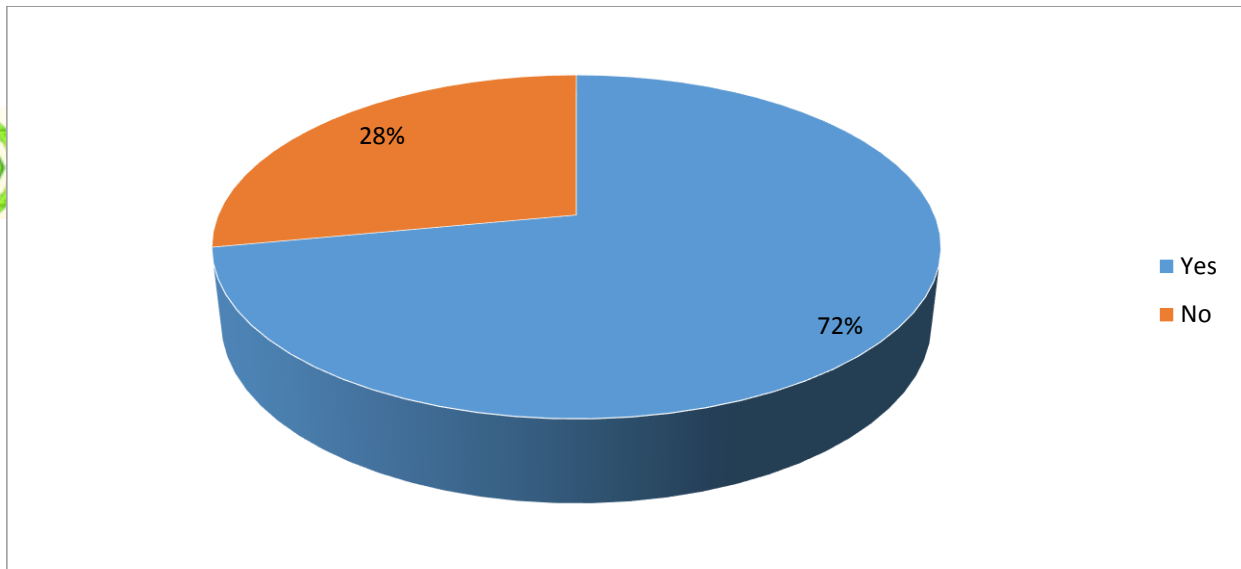
Source: Field Survey, September, 2016

From Table 4.8 above 68% of the respondents believed Temporal Electoral Commission Staff have the required competence in the use of technology in elections, whereas 32% of respondents believed they lack the needed competence.

4.4.1. Professionalism in Handling Registration and Voting Equipment

The exhibition of professional competence in the handling of these technological innovations goes a long way to determine either a success or failure of adoption by an organisation. This section gauges the perception of respondents in the professional handling of these innovations.

Figure 4.4: Professional Handling of Voting and Registration Equipment



Source: Field Survey, September, 2016



Figure 4.4 above shows that 72% of the respondents think the Temporal Staff are professionals in handling Registration and Voting Equipment, while, 28% hold a contrary view.

4.4.2. Poor handling by Temporal Staff

Snoeyink and Ertmer (2002) identify some challenges confronting the application of technological innovations in organisations to include among other things poor handling or administrative support. The set out in this section to assess the perception of respondents about the handling of these innovations by the temporal staff of the Electoral Commission.

Table 3: Poor Handling by Temporal Staff

		Frequency	Percent	Valid Percent
Valid	Yes	251	63	63
	No	149	37	37
Total		400	100	100

Source: Field Survey, September, 2016

In Table 4.9 above, it shows that 63% of respondents associated the problems of the elections to poor handling of equipment by temporal staff, while 37% did not believe is the result of poor handling of the equipment.

4.4.3. Instructions been followed by Temporal Electoral Commission Staff

For effective functioning of these technological innovations, instructions on their application must be strictly followed. The following are the perceptions of respondents on whether the temporal staff does follow the instructions when deployed at the polling stations to work.

Table 40: Temporal Staff following Instructions

		Frequency	Percent	Valid Percent
Valid	Yes	269	67	67
	No	131	33	33
	Total	400	100	100

Source: Field Survey, September, 2016

Table 4.10 above reveals that 67% of respondents agreed that temporal staff of the Electoral Commission who operated the voting equipment followed lay down instructions, while 33% did not agree that laid down instructions have always being properly followed during the registration of voters and actual voting.

4.4.4: Electoral Commission offer Enough Training to Temporal Staff

In the Table 4.11 above, 59% of respondents agreed that the Electoral Commission has offered enough training to its Temporal Staff on the use of technological innovation, while (41%) rather disagreed with that position.

Table 4.5: Training of Temporary Staff

		Frequency	Percent	Valid Percent
Valid	Yes	237	59	59
	No	163	41	41
	Total	400	100	100

Source: Field Survey, September, 2016.

4.4.5: Area of Effective Technological Application

The application of technological innovations in the various stages of the electoral process comes with different challenges. The study isolated voter registration and voting to assess the



views of respondents on which of the two areas they think the temporal staff has been more professional. Below are the responses;

Table 4.6: Areas where Temporal Staff are More Professional

Area	Frequency	Percent	Valid Percent
Registration	219	55	55
Voting	181	45	45
Total	400	100	100

Source: Field Survey, September, 2016

The Table 4.12 above shows that 55% of respondents agreed that “Voting” was one of the areas in technological application where temporal staffs were more professional, while (45%) of respondents selected registration as the areas where they showed professionalism in the handling of technological equipment.

4.4.6: Difficulties in dealing with Electoral Commission Temporal Staff

Good public relation is sometimes a challenge to some people especially in times of challenges. The study tried to find out from the electorate if they do have difficulties dealing with temporal staff when they visit the polling stations.

Table 7: Difficulties Voters Encounter with Temporal Staff

		Frequency	Percent	Valid Percent
Valid	Yes	170	42	42
	No	230	58	58
Total		400	100	100

Source: Field Survey, September, 2016

Table 4.13 above reveals that 42% of respondents said they had never had difficulties in dealing with the Temporal Staff, whereas 58% said they had some difficulties.



4.4.7: Emotional Competence when there is a breakdown of equipment

This was intended to assess the perception of the electorate on how their complaints were addressed by the temporal staff when they have challenges at the polling stations.

Table 4.8: Emotional Competence of Temporal Staff during breakdown of equipment

		Frequency	Percent	Valid Percent
Valid	Yes	243	61	61
	No	157	39	39
	Total	400	100	100

Source: Field Survey, September, 2016.

From Table 4.14 above 61% of respondents said the temporal staff had the emotionally competence in dealing with electorates when there is a breakdown of Registration or Voting Equipment; whereas, 39% said they lack emotional competence in dealing with electorates.

4.4.8: Attitude of Electoral Commission Temporal Staff during Registration and Voting.

The attitude exhibited by temporal staff could lead challenges during any activity of the Electoral Commission. The study tried to find if the electorate is comfortable with the attitude of some temporal staff when the visit the polling stations either during registration or voting.

Below are the responses.

Table 4.9: Attitude of Temporal Staff in the Electoral Processes

		Frequency	Percent	Valid Percent
Valid	Yes	240	60	60
	No	160	40	40
	Total	400	100	100

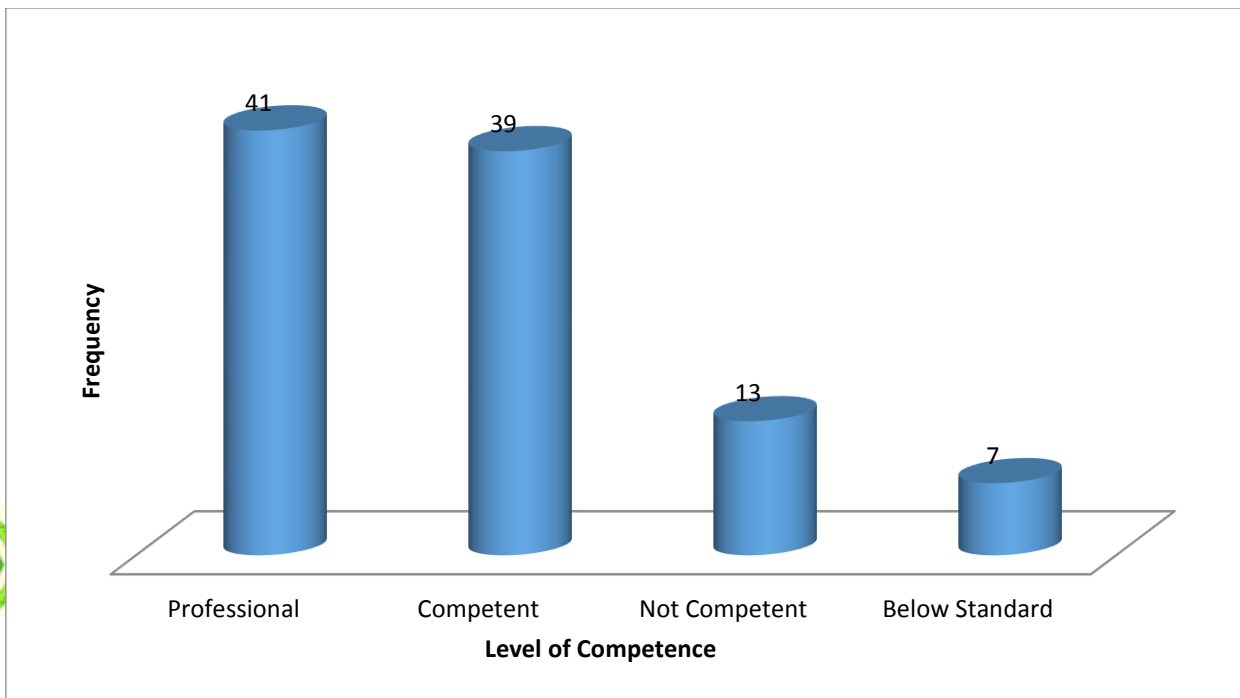
Source: Field Survey, September, 2016

Table 4.15 reveals that 60% of the respondents said the attitudes of the Temporal Staff during Registration and Voting has helped in making the electoral process acceptable to the electorate, while 40% of respondents think the attitude of the Election Officials during Registration and Voting did not help in making the electoral process acceptable.

4.4.9: General Description of Electoral Commission Temporal Staff

Respondents were asked to give a general description of the temporal staff. The figure below gives the distribution of responses.

Figure 4.5: Description of Temporal Staff



Source: Field Survey, September, 2016

From Figure 4.5 above, it indicates 41% described temporal staff as Professional, 39% described them as Competent, 13% described them as Not Competent whilst 7% think they are Below Standard.

4.4.10. Analysis of Key Findings of the Calibre of Human Resources Involved in the Use of Technological in Elections

With regards to this objective, it was found that not all Temporal Staff have the needed competence when it comes to the application of technological innovations in elections, as only 69% of the respondents believe in their competence. On the issue of the show of professionalism in the handling of Registration and Voting Equipment, 72% of the respondents think that the Temporal Staff are professionals in the handling technological equipment during Voter Registration and Voting. There was also evidence from the study that the respondents associated the problems electorates normally complain about during elections to poor handling of technological equipment by Temporal Staff as a significant 63% of the respondents associated the problems that came up during the elections to poor handling of Electoral Commission officials. This finding is supported by Jones (2004), study which attributed the ineffective use of Information and Communication Technology (ICT) to lack of confidence among workers.

The study found that Election Officials did not adequately followed laid down instructions as 67% of the respondents attested to that. It was also found that the Electoral Commission had offered inadequate training to its staff on the use of technological innovation as 59% of respondents agreed that the Electoral Commission has been giving adequate training to its Election Officials on the use of technological innovation and 41% rather disagreed with that position. Again, in the same study by Jones (2004), he further observed among other things that, ineffective training giving to workers who handle the equipment.

In terms of professionalism, the study found that Election Officials have not been professional in the handling of technological equipment deployed during Voter Registration and Voting. A

significant 55% of respondents supported this assertion whilst only 45% of respondents believe in the professionalism of Election Officials. As a result, 58% of respondents for the study indicated that they had difficulties dealing with Election Officials whereas 42% said they never had any difficulties or challenges. This finding is supported by a similar study to that of Jones (2004) by Snoeyink and Ertmer (2002), who identified lack of computer skills as well as lack of vision as to how to integrate ICT in organisations as responsible for the lack of professionalism.

This finding also conforms to the second element of the Technology-Organisation-Environment framework which guided the study. This element describes the size of the firm; centralization; formalization, and complexity of the managerial structure and most importantly the quality of human resources available to the organisation. The Framework posits that human resource policies involving employee selection, compensation, appraisal, and training have important implications for innovations implementation and ensuring professionalism of the handlers of the innovations.

The electoral system adopted by Ghana promotes a system of ‘Winner-Takes-All’. And this often result in a lot of emotional attachment to elections since every electorate want his or party to win political power. The study also set out to assess whether Election Officials have the emotional competence to deal with the electorate in the event of system breakdown mostly the periods during the electorates normally becomes agitated. The study found that 60% of respondents agreed that Election Officials have the emotional competence and the right temperament in dealing with the electorate in the event of technical glitches while 40% of respondents hold a contrary view. It was revealed by a significant 40% of respondents that Election Officials did not have the right attitude in dealing with the electorate. The conforms



with the a study by Snoeyink and Ertmer (2002) who identified some challenges confronting the application of Information and Communication Technology (ICT) in organisations to include among other things the general attitude of workers towards technological innovations, resistance to change and poor administrative support.

From the analysis of opened-ended questions in relation to the professionalism of Election Officials in the handling technological innovations in the implementation of electoral reforms, respondents in the study thinks that Election Officials had not been professional and some reasons they assigned included: the inability of Election Officials to withstand pressure from the electorate which in most cases end up confusing them, some Election Officials also succumb to pressure from Political Party Agents at the Registration Centres or Polling Stations who normally end up taking full control over the entire process, some respondents also attributed this poor remuneration and inadequate training especially on the electoral laws which made them vulnerable for manipulation by politicians, other respondents think that poor public education of the electorate on the workings of the technological innovations and the reform process poses a challenge to the professionalism of the Election Officials. As a result

when there is a system collapse, the electorate is quick to conclude that the Election Officials are deliberately manipulating it to their disadvantage hence the agitation.

A section of respondents also think that Election Officials were professional in the handling of technological innovations during Voter Registration and Voting. Reasons they assigned are; that Election Officials were able to capture less fingerprints of some applicants who have problems with their fingers by re-programming the Biometric Voter Registration kit to accept fewer than the required number of fingers in order to get them registered so they can participate in the election of leaders that would ensure good democratic governance and, that



Election Officials were also diligent in capturing both the bio and demographic data of applicants which to a very large extent reduce the number of errors, making the register more credible.

This finding is supported by the Coalition of Domestic Elections Observers (CODEO, 2008) which stated that the integration of technological innovations in elections has facilitated the speedy, accuracy and quality of election results and observation reports. In the arena of technological innovations promoting good democratic governance, Ahiabenu (2013) argues that beyond their application in the electoral environment, the full potential of technological innovations to promote transparency in governance, fight corruption, and monitor public service delivery has yet to be fully realized.

The open-ended questions also revealed that Elections Officials have the emotional competence to calm down tension in the event of a technical glitch by politely assuring the electorate that immediate measures are being put in place to get them registered or cast their votes. On the other hand, some respondents in the study think that Election Officials lack the emotional competence in handling problems as they come up with the handling of technological innovations deployed to implement electoral reforms. Some respondents reported that Election Officials use offensive comments to address their complaints.

Focus group discussants thought that Elections Officials have not been able to successfully handle technological innovations. Some argued that some Officials were not able to handle simple tasks such as; fixing of printer cartridges and performing simple troubleshooting. They also believe that election Officials failed to properly operate the Biometric Verification Devices (BVD) compelling some voters to go through Manual verification before they could cast their votes. It was also mentioned that the failure of the Electoral Commission to engage



its Service Provider (Superlock Technologies Limited) in the grassroots technical training of Officials resulted in their abysmal handling of these technological innovations in the reform process. Discussants also pointed out that most of the Election Officials lack the requisite skills and know-how since they were recruited without recourse to their educational qualifications. However, a small section of the discussants claimed that Elections Officials are often up to the task of handling technological innovations, explaining that they have acquired these skills and experiences over the years through their constant participation in electoral activities.

4.5. Objective Three Stakeholders Embracing Technology in Electoral Reforms

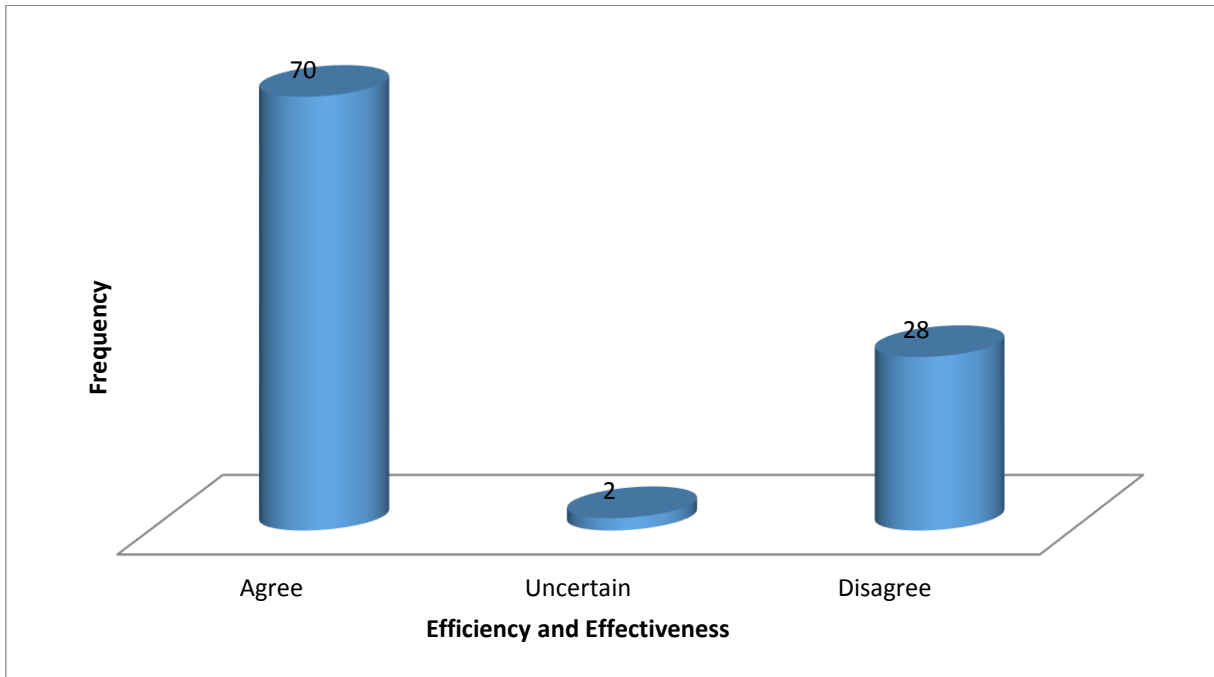
The success or failure of technological innovations in facilitating the implementation of electoral depends large on the extent to which stakeholders in the electoral process embrace their use. This objective is divided into various sections to assess whether stakeholders are embracing the innovations used by the Electoral Commission.

4.5.1: Technological Innovations in Electoral Reforms Improves the Efficiency and Effectiveness of Electoral Commission

This section assessed the perceptions of respondents on the efficiency and effectiveness of technological innovations.



Figure 4.6: Technology Ensures Efficiency and Effectiveness



Source: Field Survey, September, 2016

Figure 4.6 above shows that 70% of respondents agreed that using technological innovations in electoral reforms improves the efficiency and effectiveness of Electoral Commission, 2% were uncertain, whilst 28% disagreed with the statement.

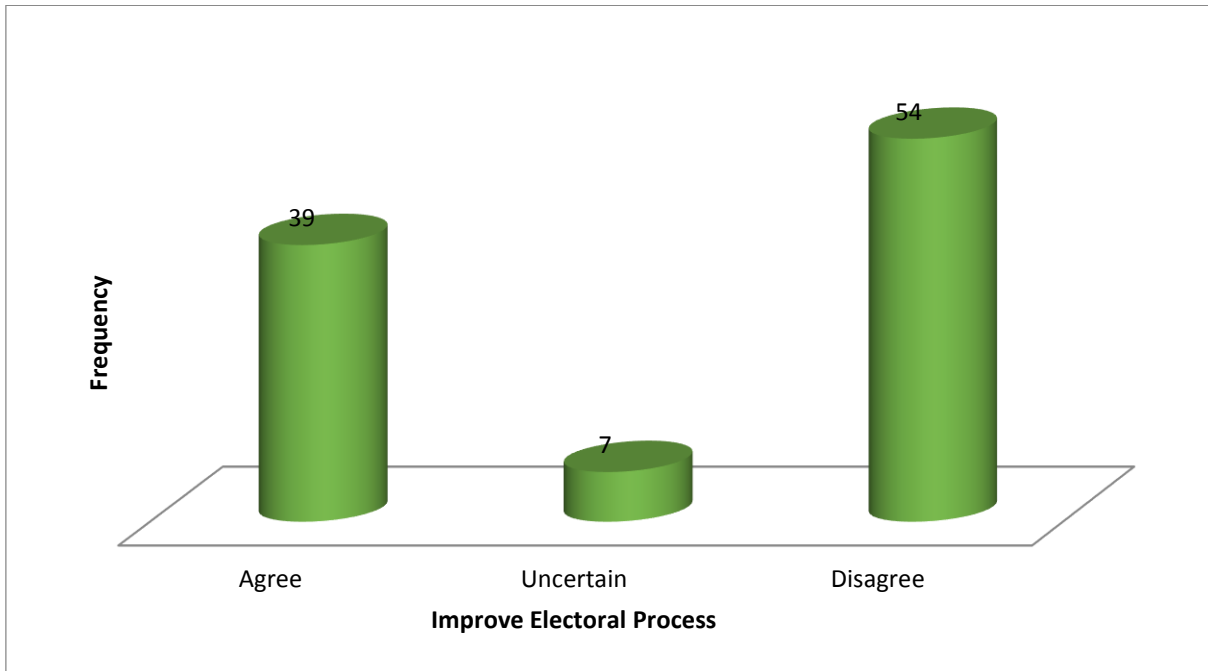
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4.5.2: Technological Innovations does not improve the Electoral Process

The Electoral Commission has over the years deployed technological innovations in its operations, this section attempted to seek the views of respondents on whether these innovations lacks the potential to improve the electoral process.

Figure 5: Technology may not improve the Electoral Process



Source: Field Survey, September, 2016

In the above Figure 4.7, it indicates that, 39% of respondents agreed that the introduction of technology may not necessarily improve the electoral process, 7% were uncertain while 54% disagreed with the statement.

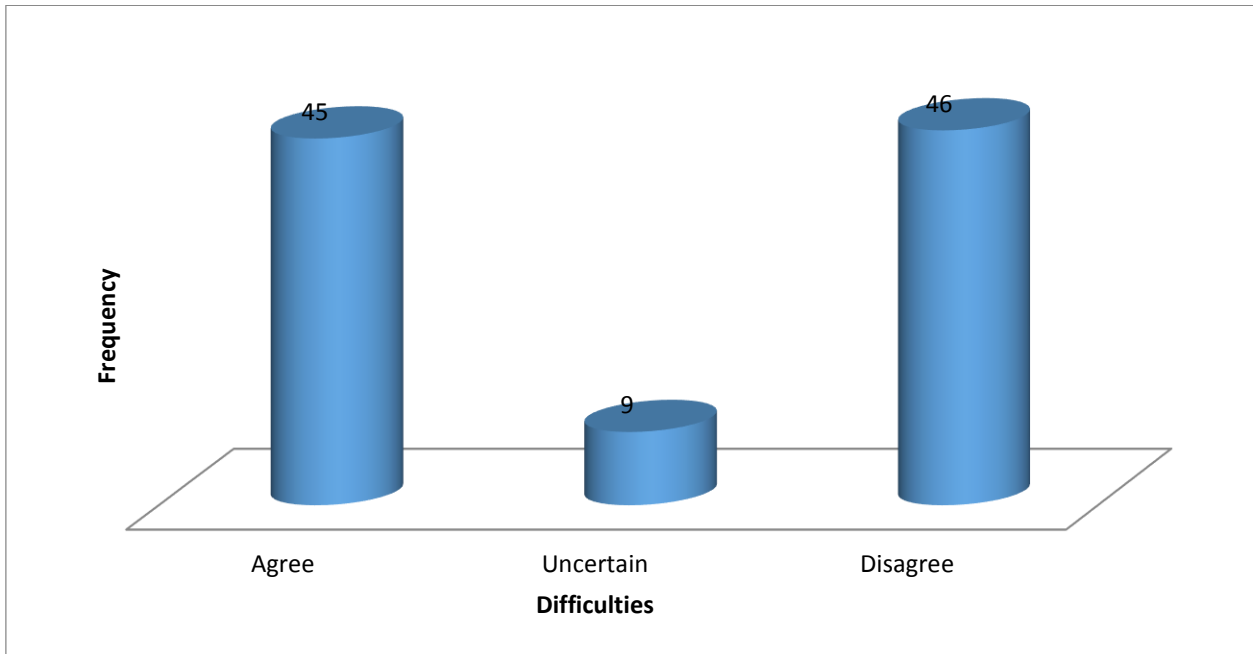
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4.5.3: Voters difficulties and computerization of electoral activities

The study anticipated that full computerization could pose a challenge to a cross section of the electorate. This section was therefore devoted to assessing whether the computerization of electoral activities has created some difficulties for the voters

Figure 6: Computerized Electoral Activities and Voters Difficulties



Source: Field Survey, September, 2016

The above Figure 4.8 shows 45% of respondents agreed that voters will have great difficulty if all the electoral activities are computerized, 9% were uncertain, whilst 46% disagreed.

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4.5.4: Technological Innovation results Transparent in Electoral Process



Transparency is an important core value the Electoral Commission always tries to exhibit in its operations through various stakeholder engagements. It is a value that projects the image of the Commission both locally and internationally. The study at this section gauges the perception of respondents on whether technological innovations have led to a transparent electoral process.

Table 4.10: Technological Innovations and Transparent Electoral Process

		Frequency	Percent	Valid Percent
Valid	Agree	243	61	61
	Uncertain	42	10	10
	Disagree	115	29	29
	Total	400	100	100

Source: Field Survey, September, 2016

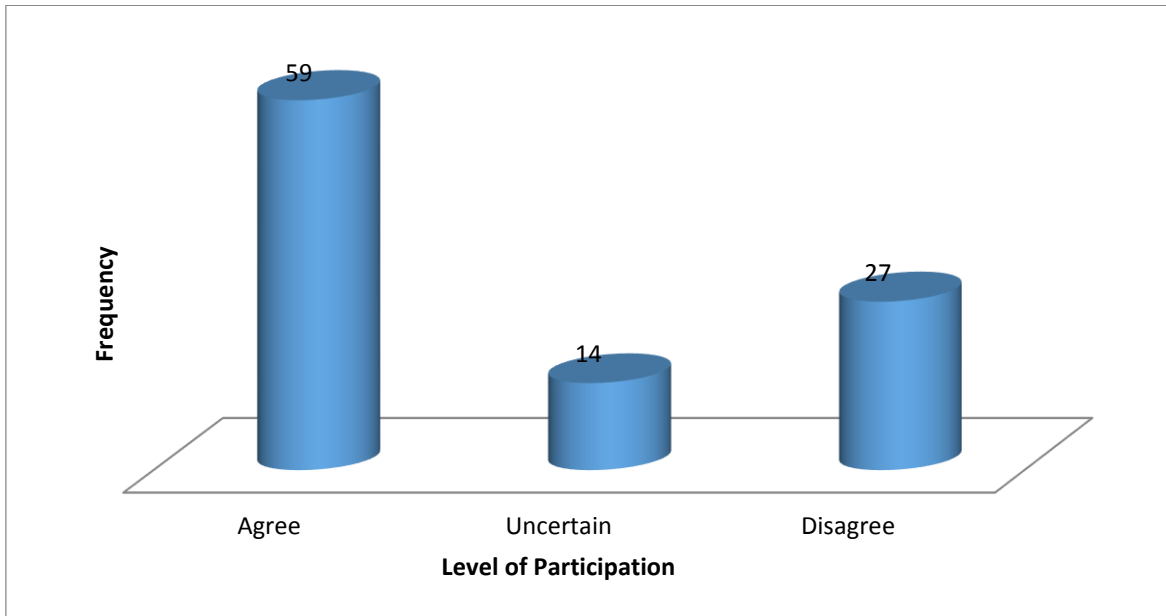
Table 4.16 above indicates that 61% of respondents agreed that technological innovations have brought about more transparency in the electoral process; however, 10% were uncertain and 29% disagreed.

4.5.5: Technological Innovations ensures convenient participation in electoral process

Technological innovations are meant to remove uncertainty and make the functional life easy. With their deployment to facilitate the introduction of electoral reforms in the Ghana's democratic governance, the study sought to find out if their adoption had made participation in the electoral process convenient for the respondents.



Figure 7: Convenient Participation made possible by Technological Innovations



Source: Field Survey, September, 2016

Figure 4.9 above indicates that 59% agreed that technological innovations have made political parties and citizen's participation in the electoral process convenient, 14% were uncertain, whilst 27% disagreed with the position.

4.5.6: Technological Innovation as means of reducing election violence



Elections in some parts of the country are sometimes characterised by violence. The following responses below indicate the perceptions of the respondents on the relationship between elections related violence and the use of technological innovations.

Table 11: Technological Innovations and Election Related Violence

		Frequency	Percent	Valid Percent
Valid	Agree	234	59	59
	Uncertain	57	14	14
	Disagree	109	27	27
	Total	400	100	100

Source: Field Survey, September, 2016

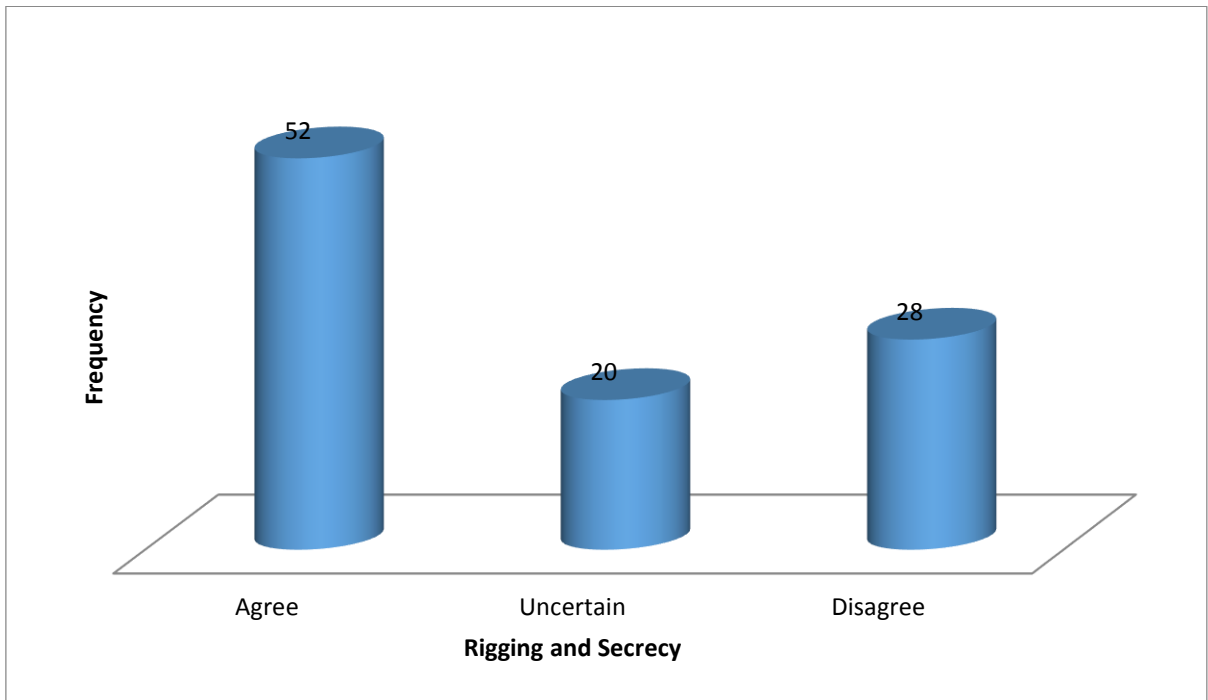
The above Table 4.17 depicts that 59% of respondents agreed that their introduction have reduce election related violence, 14% were uncertain whilst 27% disagreed.

4.5.7: Modern Technology and Vote Rigging

Over the years, complains about elections rigging often dominates the agitations that usually characterised the declaration of results. The research tried to assess the perspectives of the electorate on whether the adoption of technological innovations has helped in the prevention of vote rigging and ensuring the secrecy of voting.



Figure 8: Prevention of Rigging and Secrecy of Voting



Source: Field Survey, September, 2016

In Figure 4.10, it indicates that 52% of respondents agreed that the application of modern technology can prevent rigging and ensures the secrecy of voting, 28% were not certain, whilst 20% disagreed.

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4.5.8: Computerization Prevent many people from Participating in the Electoral Process

Given the level of illiteracy among the population, the study in this section attempts to assess the perspectives of the respondents on whether the computerization of the electoral process can prevent many electorates from participating in the electoral and democratic governance processes in the Tamale Metropolis.

Table 12: Computerization and Participation in the Electoral Process

		Frequency	Percent	Valid Percent
Valid	Agree	172	43	43
	Uncertain	60	15	15
	Disagree	168	42	42
	Total	400	100	100

Source: Field Survey, September, 2016

Table 4.18 shows that 43% of respondents agreed that computerization of electoral process will prevent many people from participating in the electoral process, 15% were uncertain, while 42% disagreed with that.

4.5.9. Analysis of Key Findings of Stakeholders Embracing Technology in Elections

In connection with this objective, this study revealed the application of technological innovations in electoral reforms improves the efficiency and effectiveness of Electoral Commission as 71% of the respondents agreed that technological innovations has enhance the performance of the Electoral Commission. Again, the study found that 39% of respondents strongly agreed that the introduction of technology may not necessarily improve the electoral process, while 54% of the participants agreed the introduction of technology may not necessarily improve the electoral process.

According to Gyekye-Jandoh (2013) the Electoral Commission initiated electoral reforms after the disputed 1992 General Elections with the consent and collaboration of the Electorate, Political Parties and Civil Society Organisations. In introducing these electoral reforms, the Electoral Commission depended on technological innovations, however, to date; there have not been cessation of complaints from stakeholders. These reforms are aimed at making the electoral process more efficient and effective in delivering free, fair, transparent and



incontrovertible elections as its contribution to democratic good governance in Ghana (Gyekye-Jandoh, 2013).

The study also found that the electorates will not face many difficulties if all the electoral activities are computerized as 45% of respondents agreed that voters will have great difficulty with fully computerized electoral activities, while 46% disagreed with that position. It was also revealed that technological innovations have not brought about transparency in the electoral process as 61% of respondents agreed with that view. The study found that participation in the electoral process by Political Parties and the Electorates have not been convenient with the introduction of technological innovations as significant 59% of respondents agreed with that assertion.

It was also found that the introduction of technology will not totally reduce election related violence as only 59 % agreed of respondents in the study agreed that technology has the potential of reducing election related violence, whereas 52% agreed the application of modern technology will not totally ensure the secrecy of voting and rigging.

From the focus group discussions, it was mentioned that stakeholders in recent times have embraced technological innovations in elections as the Electoral Commission is gradually moving from manual to technological advancement. A discussant stated that *“the introduction of technological innovations in the electoral process is generating both interest and concerns among the electorate and the Electoral Commission. According to him, these technologies range from the use of basic office automation tools to more sophisticated data processing tools”*. That stakeholders are excited about the use of technology in the electoral process, that they have considered the technology innovation to be appropriate because the idea of impersonation has been eliminated, it has prevent multiple registration and that stakeholders



are excited because the technological innovation has met international standards. Another discussant in the focus group argued that *“despite some challenges, stakeholders in the electoral process have embraced the technological innovations and in fact considered them appropriate. He stated for instance that the introduction of the Biometric Verification Device was fully supported by the electorate who thinks that it has helped to eliminate impersonation during the voting which is often a source of electoral violence”*.

This is why Crabbe (1975) states that Elections management in Ghana went through several reforms in such areas as the design and distribution of ballot papers, collation and declaration of election results as well as the role of party agents and the effective verification of voters to prevent impersonation and ensure credible polls. Other reforms include the counting of votes and the proper ballot accounting conducted at each polling station at the close of polls.

The discussants maintained that the electorate has so far not shown any signs of resistance towards the technological innovation the Electoral Commission has been deploying in the introduction of electoral reforms. It was also mentioned that some electorates praised the

Electoral Commission for putting measures in place to sanitize the electoral process and promoting good democratic governance. Participants agreed that even though there have been some few irregularities; technology application is the way if the Electoral Commission is to make its contribution to good democratic governance.

Furthermore, these participants clearly stated that stakeholders really embraced technological innovation in electoral process especially the introduction of Biometric Verification Devices (BVD), the use of Transparent Ballots Boxes, Seals, Tamper Evident Envelopes, Indelible ink, Electronic Transmission and Projection of Result at the Collation Centres.



These findings are confirmed by the Electoral Commission (2000) that the introduction of the Transparent Ballot Box innovation in the 1996 Presidential and Parliamentary Elections which was facilitated by Donor Support resulted in a rise in voter turnout shooting up from 56.2 percent in 1992 to a record 78.2 percent in 1996, showing the heightened level of confidence stakeholders have in the electoral process (EC, 2000).

4.6. Objective Four: Appropriateness of Technological Innovation in Electoral Reforms

Where technological innovations are perceived as being in consistent with existing values, past experiences and needs of potential adopters, it is deemed appropriate (Rogers, 2003). The current study tried to find out if the electorate considers these innovations as appropriate.

4.6.1: Technology innovation provides more information on electoral process

This section of the study is aimed at assessing the application of technological innovations have facilitated public education of the electorate on the electoral and governance processes.

Table 13: Technological Innovations and Information on Electoral Process and Good Governance

		Frequency	Percent	Valid Percent
Valid	Agree	264	66	66
	Uncertain	54	14	20
	Disagree	82	20	14
	Total	400	100	100

Source: Field Survey, September, 2016

This Table 4.19 show 66% of respondents agreed that technological innovations provide the electorate with more information on electoral and democratic governance processes, 14% were not certain and 20% disagreed.



4.6.2: The Introduction of Biometric Registration System is Very Appropriate

The biometric voter registration system was one of the novelties in terms of technology application by the Electoral Commission. Despite its introduction in the 2012 general elections, the processes were still bedeviled with challenges. As a result, the study sought to investigate if it was an appropriate to adopt it. The table below gives the responses from the electorate who took part in the study.

Table 4.14: Appropriateness of Biometric Registration System

		Frequency	Percent	Valid Percent
Valid	Agree	234	59	59
	Uncertain	51	12	12
	Disagree	115	29	29
	Total	400	100	100

Source: Field Survey, September, 2016

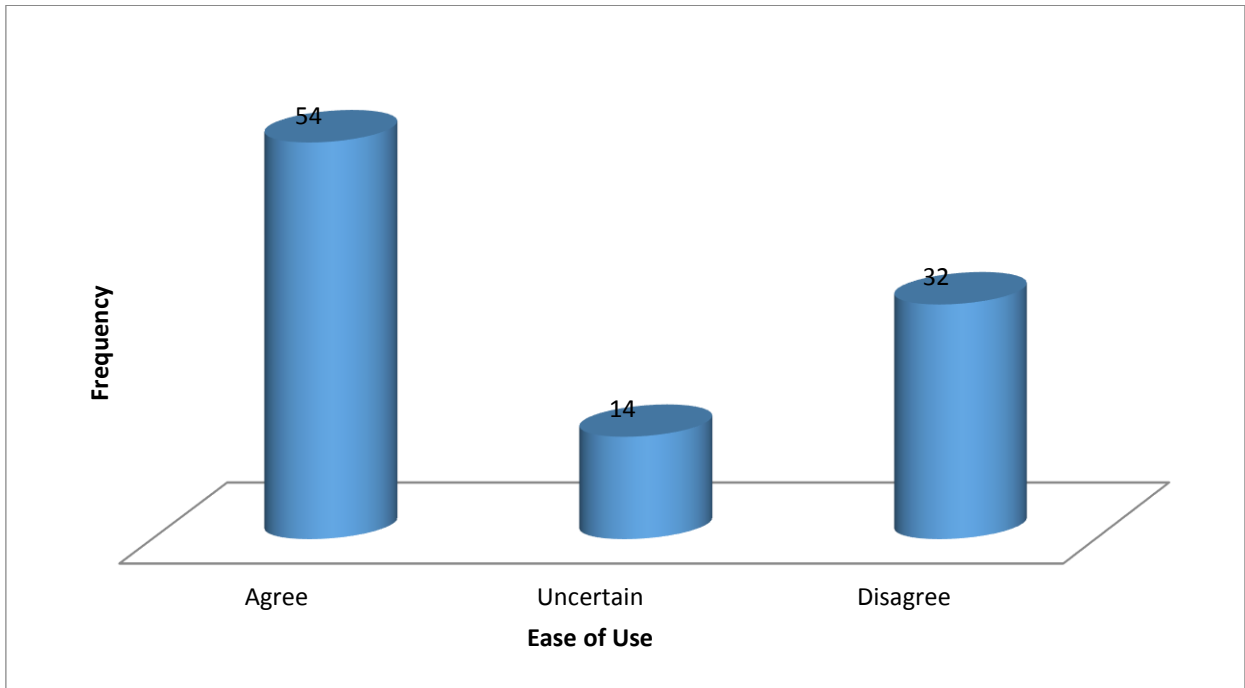
The above Table 4.20 shows 59% of the respondents agreed that the introduction of Biometric Registration System is very appropriate, 12% were uncertain and 29% disagreed.

4.6.3: Easiness of the Biometric Process

The perceived ease of use is determinant for either the acceptance or rejection of an innovation by an adopting organisation or individual (Rogers, 2003). The current study asked respondents if they find it easy going through the biometric registration process. The figure below shows the various responses to the question.



Figure: 4.9: Ease of the Biometric Registration Process



Source: Field Survey, September, 2016

The Figure 4.11 above reveals that 54% of respondents agreed that it was easy to go through the Biometric Registration Process, 14% were uncertain and 32% disagreed with the position.

4.6.4: Complains about Biometric Registration Equipment



Stakeholder complains persisted even after the introduction of the biometric system. The researcher posed the question to elicit the views of respondents as to whether the persistent complains are a result of the biometric registration equipment.

Table 15: Complaints about the Biometric Registration Equipment

		Frequency	Percent	Valid Percent
Valid	Agree	218	55	55
	Uncertain	49	12	12
	Disagree	133	33	33
	Total	400	100	100

Source: Field Survey, September, 2016

From Table 4.21 above, 55% of respondents agreed that there were several complaints about the Biometric Registration Equipment, 12% were uncertain whilst 33% disagreed that the complaints were not a result of the Equipment.

4.6.5: The Betterment of the New Voters Cards and the Old Ones

Respondents were asked to indicate which of the voter ID cards in their view they think was of a higher quality

Table 16: The New and Old Voter ID Cards

		Frequency	Percent	Valid Percent
Valid	agree	215	54	54
	Uncertain	65	16	16
	Disagree	120	30	30
	Total	400	100	100

Source: Field Survey, September, 2016

Data from Table 4.22 reveal that 54% agreed the New Biometric Voter ID Card is better than the Old Voters ID Card due to the technology used, 16% of the respondents were not certain while 30% disagreed with that.



4.6.6: Easiness of the voter verification process

The biometric verification device was introduced to bring improvements into the voter identification processes and to prevent impersonation during elections. The question this section addressed is whether the device has made the easy.

Table 4.17: Voter Verification Process and Technological Innovations

		Frequency	Percent	Valid Percent
Valid	Agree	208	52	52
	Uncertain	63	16	16
	Disagree	129	32	32
	Total	400	100	100

Source: Field Survey, September, 2016

Table 4.23 results indicate that 52% of the sample agreed that technological innovations has facilitated the Voter Verification Process, 16% were not certain while 32%) disagreed with the statement.

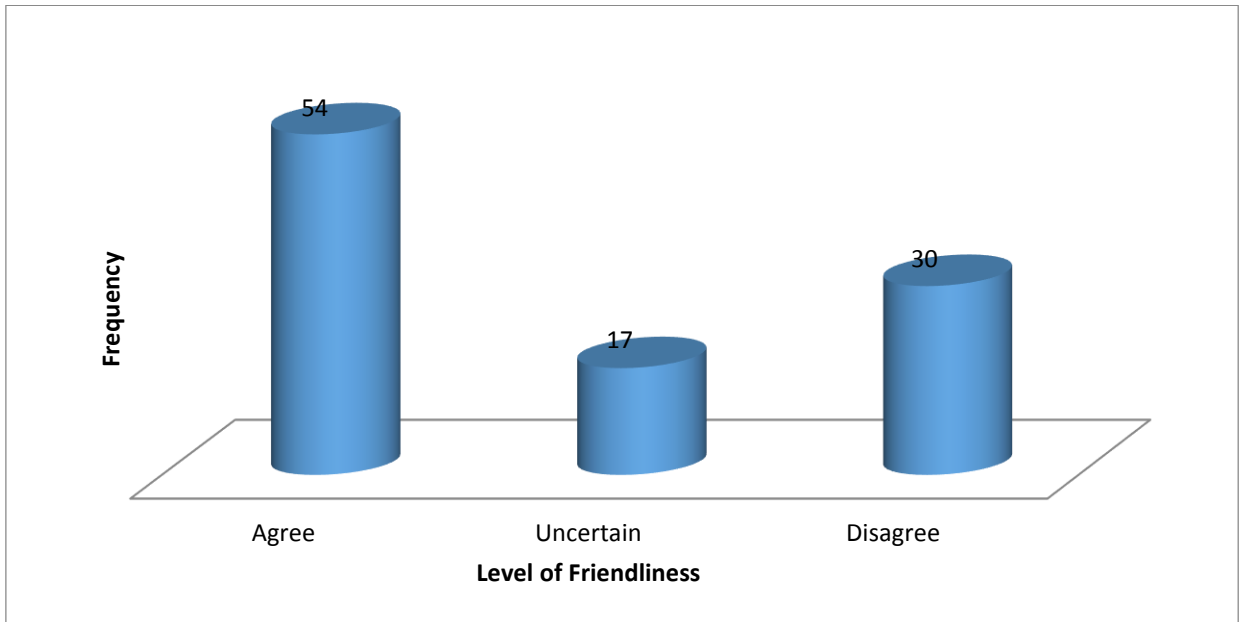
4.6.7: The Application of Technological Innovations and Friendly Electoral Process

The acceptability of an innovation would depend on how friendly the electorate finds it use.

The question to elicit views from the electorate on whether their used has been friendly.



Figure: 4.10: Friendliness of the Application of Technological Innovations



Source: Field Survey, September, 2016

Responses in Figure 4.12 show that 54% agreed that the application of technological innovations has made the electoral process friendlier, 16 % were not certain and 30% disagreed with that position.

4.6.8: Technological Innovations and Appropriate Weather Conditions in the Country



The effective functioning of these innovations could be impeded by the prevailing whether condition. The table below shows the perspectives of the electorate on whether the technology is compatible with the weather.

Table 4.18: Technological Innovation and the Weather in the Country

		Frequency	Percent	Valid Percent
Valid	Agree	145	36	36
	Uncertain	98	25	25
	Disagree	157	39	39
	Total	400	100	100

Source: Field Survey, September, 2016

In Table 4.24 above, 36% of respondents agreed that technological innovations used by the Electoral Commission are more appropriate for the weather conditions in the country, 25% not certain and 39% disagreed with the statement.

4.6.9: Availability of Parts to fix Broken Equipment

The need to have spare parts to immediately fix broken down equipment to ensure an uninterrupted registration or voting process is very crucial. The study attempted to find if the electorate thinks that the Electoral Commission has readily available parts to fix broken equipment.

Table 19: Availability of Parts for Broken Equipment

		Frequency	Percent	Valid Percent
Valid	Agree	160	40	40
	Uncertain	89	22	22
	Disagree	151	38	38
	Total	400	100	100

Source: Field Survey, September, 2016

From Table 4.25 above shows 40% of respondents agreed that the Electoral Commission has readily available parts to immediately replace broken down equipment, 22% uncertain 38% disagreed with the statement.



4.6.10. Analysis of Key Findings Of Appropriateness of Technological Innovations in Electoral Reforms

In connections with this objective, the study found that technological innovations provide inadequate information on the electoral process and good democratic governance as only 66% of the respondents agreed the statement. The study also found at appropriate and effective when the Biometric Registration System was introduced as 59% of the respondents agreed with its appropriateness.

The ease of going through the biometric registration process was also found not to be flexible and easy as only 54% agreed that it was very easy going through the biometric registration process, while 33% disagreed that the process was easy. The study established that there were several complaints about the Biometric Registration Equipment from electorates as 55% of respondents complained about the Biometric Registration Equipment and only 33% disagreed with the position. On the issue of the new and the old Voter ID Card, the study revealed that the new Voter ID Card is better than the old one due to the new machines been used as 54% of the respondents agreed that the new Voter ID Card is better than the old one due to the new machines been used. This finding conforms to Rogers (2003) complexity attribute of an innovation. This attribute looks at the degree of perceived difficulty to understand and use an innovation reflects on the rate of adoption. It is clear that respondents who complained about the technological innovation perceived them as difficult to understand and use and vice versa.

The study found that the voter verification process was not all that easy with the application of technological innovations as only 52% of the respondents agreed it was very easy. In relations to how friendly technological innovations has made the electoral process, the study shown that its application has not significantly made the electoral process friendlier as just



54% of the respondents agreed with the assertion. Those who hold this position perceived the innovations as being consistent with existing values, past experiences and needs of potential adopters (Rogers, 1993).

Technological innovations used by the Electoral Commission were found not to be more appropriate for the weather conditions in the country as just 36% of the respondent agreed that technological innovations used by the Electoral Commission are more appropriate for the weather conditions in the country. The study revealed that the Electoral Commission has no readily available parts to immediately replace broken down equipment as 40% of the respondents held that view. However, this is a finding from the study. Contrary to this perception, checks from the Electoral Commission reveal that spare parts for their equipment are always readily available; the problem sometimes is the late reporting of these problems to the right officials for immediate action to be taken or sometimes the breakdown of vehicles dispatch to deliver such parts. The study also found that not all stakeholders are able to use both registration and voting equipment without difficulty as only 40% of the respondents think the use of the equipment are without difficulties and majority of the respondents 44%

disagreed that all stakeholders are able to use both registration and voting equipment without difficulty and 16% who were uncertain whether there are any difficulties associated with the use of technological innovations.

From the analysis of the open questions' responses with regards to linking stakeholders complain after elections to technological innovations, the findings were that: the stakeholders complain are mostly due to system breakdown, stakeholders complain are as a result of our lack of understanding of the technological innovation and the short comings along with it and lack of remedies in the event, there are no durable equipment to ensure the reliability of the



devices and results, ignorance on the part of some officials in the operation of this equipment, sometimes with minor technical glitches such as the inability of the device to verify eligible voters, the media picks it up and it becomes a major electoral complaint. These complaints mostly border on the view of the electorates that the technological innovations are not standard, thereby depriving the electorate the right to exercise their franchise.

Based on the above findings, Kuris (2012) explains why questions still remained unanswered on the impact of technological innovations in the introduction of Electoral Reforms and the promotion Good Democratic Governance. The reasons for some of these questions are that some initial technical glitches often tend to increase tension, thereby raising the question of whether technology has facilitated the introduction of electoral reforms. For instance, with Nigeria's application of technological innovations in electoral reforms in elections 2010, tension started to mount when the former president, Olusegun Obasanjo had his fingerprints rejected by the Voter Registration System. In the same elections, President Goodluck Jonathan could not find his name in the Biometric Voters Register, thereby denying him the right to exercise his franchise (Kuris, 2012).



4.7: Objective Five: Capacity of the Electoral Commission to Adopt Technological Innovations

The availability of local infrastructure within an organisation to support the adoption and effective utilization of technological is related to an organization's innovativeness.

4.7.1: Local Infrastructure Support for Adoption of New Technological Innovations

The question that this section attempts to address is if the Electoral Commission has the necessary local infrastructure to support the adoption of these new technologies

Table 20: Local Infrastructure Capable to adopt New Technology

		Frequency	Percent	Valid Percent
Valid	Yes	207	52	52
	No	193	48	48
	Total	400	100	100

Source: Field Survey, September, 2016

Table 4.26 above shows that 52% of respondents thought the Electoral Commission has local infrastructure capable of supporting the adoption of new technological innovations, while 48% did not hold that view.

4.7.2: Technical Capacity at the Electoral Commission to implement Electoral Reforms

The availability of the right technical capacity to enable the Electoral Commission to effectively use technological innovations to facilitate the implementation of electoral reforms is paramount. The table below gives a distribution of responses of the electorate.

Table 21: Technical Capacity and Implementation of Electoral Reforms

		Frequency	Percent	Valid Percent
Valid	Yes	256	64	64
	No	144	36	36
	Total	400	100	100

Source: Field Survey, September, 2016

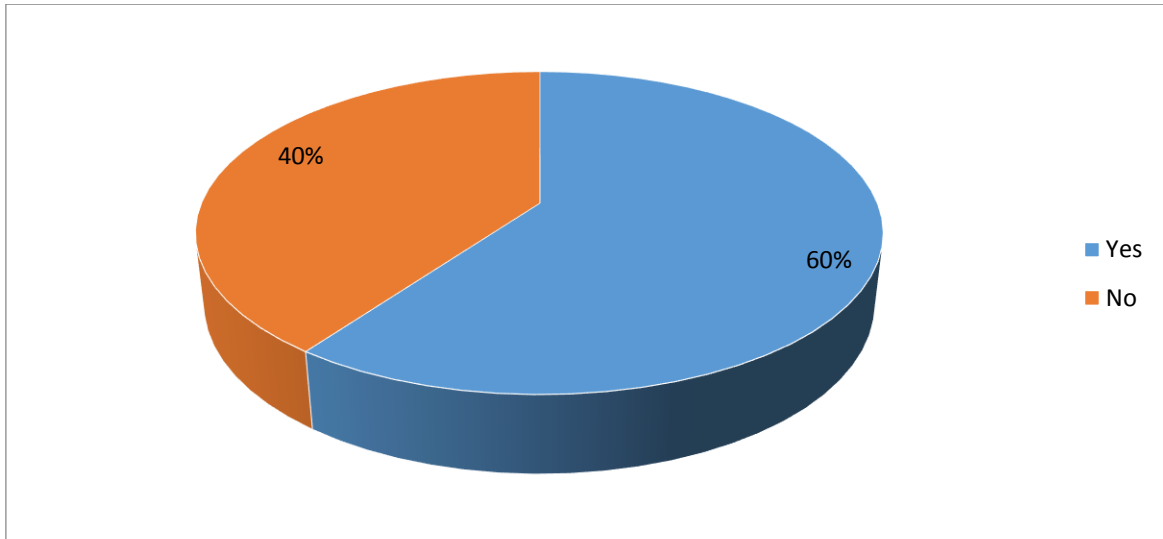
Table 4.27 indicates that 64% of respondents said YES the Electoral Commission has the technical capacity to implement electoral reforms through technological innovations, while 36% of respondents said NO the Electoral Commission lacks technical capacity.



4.7.3: Resourcefulness of the Electoral Commission in Procuring the Technologies

The necessary funding to procure technologies also came under scrutiny in this study. The figure below indicates the responses.

Figure: 4.11: Resource Availability to the Electoral Commission



Source: Field Survey, September, 2016

Figure 4.13 depicts that 60% of respondents said YES, the Electoral Commission has been properly resourced to procure the right technologies for elections, while 40% said NO.

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4.7.4: Skilled Staff at the Electoral Commission to run Technological Innovations

Skilled manpower is required in any organisation that is embarking on the adoption of technological innovations. The question that is addressed here is whether the Electoral Commission has the skilled staff to handle these innovations.

Table 22: Skilled Staff to run and maintain Technological Innovations

		Frequency	Percent	Valid Percent
Valid	Yes	221	55	55
	No	179	45	45
	Total	400	100	100

Source: Field Survey, September, 2016

Data from Table 4.28 above reveal that 55% of respondents agreed that YES, the Electoral Commission has the appropriate skilled staff to run and maintain technological innovations, while 45% said NO to the statement.

4.8: General Assessment of Technological Innovations in Elections

This section of the study assessed the general impressions of the electorate on the Electoral Commission use of technological applications.

4.8.1: Holistic view of Technological Innovation by the Electoral Commission

The electorates were asked to give their impression about whether the Electoral Commission has been taking a holistic view of technological innovations before their adoption in electoral reforms.

Table 23: Holistic View of Technological Innovations

		Frequency	Percent	Valid Percent
Valid	Yes	245	61	61
	No	155	39	39
	Total	400	100	100

Source: Field Survey, September, 2016



Table 4.29 above shows that 61% of respondents said YES, the Electoral Commission took a holistic view of technologies before adopting them in elections, 39% of the respondents said NO.

4.8.2: Impact of Technological Innovations considered before Introduction

This section elicit the perspectives of the electorate on whether the Electoral Commission has carefully considering the impact of these innovations before their introduction.

Table 24: Impact Consideration before Introduction

		Frequency	Percent	Valid Percent
Valid	Yes	265	66.3	66
	No	135	33.8	34
	Total	400	100.0	100

Source: Field Survey, September, 2016

Table 4.30 above shows that 66% think the impact of technological innovations was considered by the Electoral Commission before their introduction, while 34% disagreed.

4.8.3: Transparency and Protection of Core Values in the Implementation of Technology

Aided Electoral Reforms

In the execution of its constitutional mandate, the Electoral Commission has core values it protects. The study elicits perspectives from the Tamale Metropolis if technological innovations have facilitated the maintenance of these values.



Table 4. 25: Maintaining Transparency and Protecting Core Values

		Frequency	Percent	Valid Percent
Valid	Yes	256	64	64
	No	144	36	36
	Total	400	100	100

Source: Field Survey, September, 2016

From Table 4.31, 64% of respondents said YES, the Electoral Commission has been able to maintain transparency and ensures that its Core Values are protected in the implementation of technology aided electoral reforms, while 36% said NO.

4.8.4: Measures to Ensure the Security of the System in Technological Innovation

Maintenance of security of the system in technology adoption is crucial because it ensures the sanctity of the innovation.

Table 4. 26: Security of Technological Innovations

		Frequency	Percent	Valid Percent
Valid	Yes	237	59	59
	No	163	41	41
	Total	400	100	100

Source: Field Survey, September, 2016

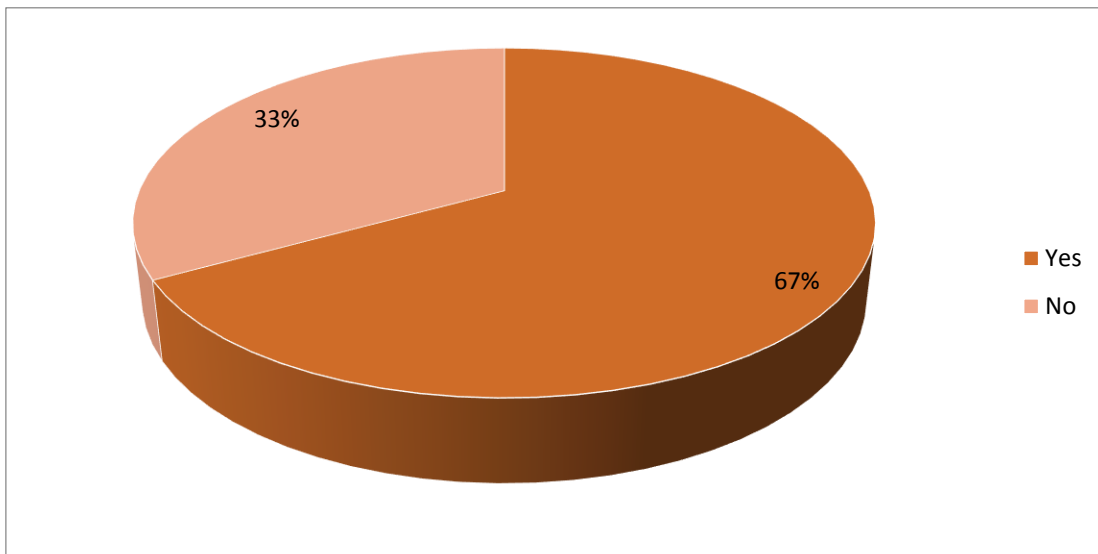
Table 4.32 above indicates that 59% of respondents agreed that, the Electoral Commission has enough measures in place to ensure the security of the system, while, 41% of the respondents holds a contrary view.



4.8.5: Accuracy of Results Produced by the Use of Technological Innovations in Elections

The accuracy of an election results could be the source of violence. The perspectives of the electorate was sought to ascertain whether in their view technological innovations have produced accurate election results.

Figure: 4.12: Accuracy of Elections Results from Technological Innovations



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Figure 4.14 above shows that 67% of respondents said that results produced by technological aided elections are accurate; while 33% said no.



4.8.6: Stakeholders Receptive of Technological Innovations

The successful adoption of technological innovations by any organisation depends largely on how its stakeholders receive the innovation. This assessed the receptiveness of these innovations by the electorate.

Table 4. 27: Stakeholders’ Receptiveness of Technological Innovations

		Frequency	Percent	Valid Percent
Valid	Yes	260	65	65
	No	140	35	35
	Total	400	100	100

Source: Field Survey, September. 2016

Results from Table 4.33 above reveal that 65% of respondents said stakeholders are receptive to technological innovations, while 35% said no.

4.8.7: General Assessment of Technological Innovations in Electoral Reforms and Democratic Governance

This section was devoted to a general assessment of technological innovations in electoral reforms in Ghana’s democratic governance.

Table 4.28: General Assessment of Technological Innovations

		Frequency	Percent	Valid Percent
Valid	very relevant	205	51	51
	relevant	153	38	38
	somewhat relevant	27	7	7
	very irrelevant	9	2	2
	don’t know	6	2	2
	Total	400	100	100

Source: Field Survey, September, 2016

Table 4.34 above concludes with the general assessment of technological innovations in electoral reforms and good democratic governance and shows that 51% of respondents think is



very relevant, 38% think it is relevant, 7% assess it as somewhat relevant, 2% think it's very irrelevant, while 2% did not know.

4.8.8. Analysis of the Key Findings of the Capacity of the Electoral Commission to Adopt Technological Innovations

With reference to this objective, it was found the Electoral Commission have inadequate local infrastructure capable of supporting the adoption of new technological innovations as only 52% of respondents agree with that position. The study also revealed that the Electoral Commission has the technical capacity to implement electoral reforms using technological innovations but this capacity is not all that adequate as only 64% said YES, while 36% said NO, the Electoral Commission does not have the technical capacity to implement technology aided electoral reforms.

In the area of procurement, the study revealed the Electoral Commission is not properly resourced financially, since a significant (40%) of respondents hold this view, whereas (60%) of respondents thought that the Electoral Commission has always been properly resourced to procure new technological innovations. It was also found that the Electoral Commission has inadequate skilled staff to run and maintain technological innovations as only (55%) of the respondents said YES, while a significant (45%) did not believe it is capable of running and maintaining technological innovations.

From the focus group discussions, participants were of the opinion that in terms of infrastructure such as; internet facilities in their District Offices, permanent staff with technical knowledge to repair computers, printers and photocopies, the Electoral Commission mostly relied on temporal staff. Some participants however hold a contrary view.



Kuris (2012) confirms the above finding by claiming that in the United States of America 2004 elections, there were reported cases of vote switching in Mahoning County in Florida, inadequate Electronic Voting Machines in some states and the freezing of computer servers which raises questions about the legitimacy of the elections and importantly the exact impact of technological innovations.

4.8.9. Analysis of the Key Findings of General Assessment of Technological Innovations in Electoral Reforms

The study in this section sought to assess whether the Electoral Commission do assess the impact of technological innovations on election before adoption. It was revealed from the responses that between 61% and 66% stated that has at all times assessed their impact through various pilot projects it normally rolls out before full adoption. This finding is supported by Kangah and Sarfo-Kantanka (1998) when they argued that before the adoption of the Optical Mark Readers (OMR) scanners, the West African Examinations Council was already using it to grade students test. As a result, it was easy for the Electoral Commission to assess its possible impact on the Voter Registration Exercise. Kangah and Sarfo-Kantanka (1998)

concludes that among other benefits that were accrued are; the timely completion of the exercise; high accuracy of captured data compared with previous years; and above all, there was a lowering of cost to the Electoral Commission.

However, a section of respondents from the analysis of open-ended questions thinks that the Electoral Commission mostly rushes into the adoption of technological innovations without recourse to their possible impact on its electoral activities. They argued that, unlike in the advance jurisdictions where literacy rates are high and understanding the workings of these innovations easy, the same cannot be said of Ghana. As a result, before any adoption, the



Electoral Commission should as a matter of urgency assess their possible impact on the elections. This position was supported by 34% of respondents interviewed for the study. In their view, this often results in mistrust in the system. This view contradicts the position of IIDEA (2006) when it argued that electoral reforms are aimed at improving the responsiveness of an electoral process to the desires and expectations of the electorate. The IIDEA (2006) then concludes that the reform process is intended to foster and enhance impartiality, inclusiveness, accuracy and transparency of the electoral process. But a significant 34% of respondents think that technology aided electoral reforms rather impacted negatively on the electoral process and therefore deprive them their right to inclusiveness.

On ensuring transparency in operations and protecting its core values with the application of technological innovations, the study set out to identify these core values and to assess whether the use of technology has affected these values. In an interview with a former Deputy Chairman of the Electoral Commission, David Adeenze Kangah (2015) he identified these core values to include; freeness, fairness, transparency, accountability; and probity among others. The study sought to find out whether the deployment of these reform innovations has protected these core values. The study revealed 64% of respondents think that technological innovations have enhanced the protection of its core values while 36% of respondents dissented.

Another thematic area where the general assessment of technological innovations in electoral reforms and good democratic governance touches on is the security of the system. The study set to find out if the Electoral Commission has been able to properly secure the system and hence prevent outsider intrusion. Studies in Information Technologies have shown that systems can become very vulnerable to attacks if not properly secured. As a result, the

Electoral Commission in its attempt to deploy technological innovations has to put the right measures in place to protect the system. The study revealed that 59% of respondents interviewed agreed that the Electoral Commission has been putting the right security features to protect the system from attacks and possible manipulation by politicians, while 41% of respondents think the Electoral Commission has failed to prevent outsider attacks on its system. From the analysis of the open-ended questions, some respondents gave examples such as; the inability of election officials to change setting like date and time or even adjust any setting on the laptop computer as measures that were put in place to secure the system. They argued that in the event of a breakdown of the system in some cases it was difficult to retrieve lost data. Respondents also argued that the custody of the registration and voting equipment also raises some security issues. They thought that the failure of the Electoral Commission to acquire secure places where these equipment are kept after the day's activities but are left in the hands of officials compromises their security, stating for instance that in the 2012 Biometric Voter Registration exercise, there were reported cases from the Electoral Commission that people were registered outside the normal registration period.



The above findings conforms with Afari-Gyan (2014) assertion that as useful as technology could be to election administration, there was no doubt that the use of Biometric Technology came with risk right from the tender process, and in particular risk associated with maintenance and support in the field, storage, preservation and security of data and the sustainability of the entire system. He concluded that, the adoption of technology raised not only technical issues, but others like operational and legal challenges relating to the right of the voter, adding that it is also a moot question as to whether technology should entirely

replace the human factor in elections, thereby precluding scrutiny by election officials, party agents, observers and the media (GNA, 2014).

Voter perception of the accuracy of election results produced through technological innovations was also assessed. As earlier stated, despite the deployment of modern technological innovations by the Electoral Commission in the 2012 General Elections, the presidential election results were contested in the Supreme Court. The same could be said of the 2004 presidential election of the United States of America (USA) where election results from Florida despite the use of modern technological innovations.

The study found that 67% of respondents believe in the accuracy of election results generated through technology aided reforms and a resultant trust in the electoral process, whilst 33% of respondents holds a contrary view. This finding is in line with Ayee (2001) assertion that, the Electoral Commission in its resolve to produce accurate and acceptable results to stakeholders in the 2000 general elections deployed the right technological innovations to develop a reasonable good register and an effective voter identification system for the elections.

Stakeholder receptiveness or embracing in electoral reforms was also assessed in the study.

The success of adoption of any technological innovation depends on how well it evolves to meet the needs of more and more demanding and risk-averse individuals in a population. In assessing whether stakeholders are receptive or have embraced technological innovations deployed to facilitate electoral reforms, it was found that 65% of respondents have embraced these innovations, while 35% are not receptive of the innovations in elections. This is an indication that, technological innovations have not received the full support of all electorates, given that the percentage of respondents that dissented is significant. This finding conforms with Chuttur (2009) study of acceptance of technological innovations when he posit that with



the growing technology needs in the 1970's and the increasing failures of systems of adoption in organisations, predicting system use became an arena of interest for many researchers. Chuttur (2009) held the view that, most of the studies carried out failed to produce reliable measures that could explain system acceptance or rejection.

The last thematic area the study focus on is an assessment of the relevance of technological innovations in electoral reforms and the promotion of good democratic governance in Ghana and Tamale Metropolis in particular. Princeton (2005) in his study of democracy and elections stated that they are inextricably linked. Princeton (2005) opined that, whatever else that is essential to make democracy effective and sustainable, elections is the lifeblood of the system, the constant affirmation of legitimacy for its leaders and the bond that link those leaders with the people. He concludes that elections and democracy have become synonymous in every political thought and analysis especially when issues of good democratic governance are being discussed. The study revealed that 51% of respondents interviewed believe that technological innovations are very relevant in the implementation of electoral reforms and the promotion of good democratic governance in Ghana.

Discussants at the focus group were however unanimous in their agreement that these innovations have successfully facilitated the introduction of electoral reforms and also promoted good democratic governance in Ghana. The participants also intimated that technological innovations have to a large extent remove the human element in the electoral and governance processes thereby reducing doubts in the minds of the electorates, hence reducing complaints, electoral related violence and promoting mass participation in the electoral and governance processes. This is supported by the views espoused by Gyekye-Jandoh (2013), which states that, for citizens of any country to benefit from good democratic



governance practices, they must actively participate in the selection processes of their leaders through free, fair, credible and democratic elections.

4.9. Presentation of Other Findings

The analysis of open ended questions revealed the following findings;

- With regard to the attitude of Temporal Staff helping to improve the electoral process, the study revealed that;
 - Temporal Staff has displayed a positive work attitude at the Polling Station by showing political neutrality in the discharge of their assignment
 - Temporal Staff ensure that the right procedures are used in the execution of the task by strict adherence to the process
 - Temporal Staff have displayed a positive attitude in dealing with concerns of the electorate.
 - Some Temporal Staff of the Electoral Commission show open bias towards some political parties.
- On the causes of stakeholder agitation, the study found the following;
 - The failure of some Temporal Staff to exhibit political neutrality in the discharge of their duties.
 - Desperation on the part of politicians to win elections at all cost.
 - The demand for more transparency from the Electoral Commission by stakeholders.
 - Lack of education of political party agents on the appropriate laws governing the elections.



- Lack of permanent staff to handle certain key areas of operations of the Electoral Commission.

4.10. Conclusion

This chapter has presented the data and analysis of responses from both the questionnaire interviews as well as the focus group discussions based on the various research questions. From the analysis of the field data, it is concluded that technological innovations has made a positive contribution to Ghana's democratic development given the high percentage of respondents who agreed with the questions posed to them.

The next chapter is five, which consist of the summary, conclusion and recommendations.



CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1: Introduction

The chapter presents a summary of the study, methodology, key findings, conclusion and recommendations based on the field survey. The focus of the study was to assess the role of technology in promoting electoral reforms and good democratic governance in Ghana in general, and Tamale metropolis in particular.

5.2. Summary of the Study

The study assessed the role of technological innovations in electoral reforms and good democratic governance in Ghana and Tamale Metropolis in particular. The purpose was to assess the extent to which technological innovations have facilitated the implementation of electoral reforms and also promoted good democratic governance within the Tamale Metropolis. The Tamale Metropolis was selected for the study because it has become a flashpoint for active political activities since the institutionalisation of regular democratic elections by the 1992 Fourth Republican Constitution and also as a fast developing metropolis; the rate of technology adoption is of interest to the researcher. Technology adoption in the study is examined in the context of two theories; the Diffusion of Innovations by Rogers (2003) and Technology-Organisation-Environment Framework cited in Salimonu et al (2013).

Key concepts and thematic areas that were covered by the literature review include; tracing the trajectory of technological innovations in electoral reforms in Ghana and definition of concepts such as; technology, innovation, good governance, democratic governance, electoral



reforms, electoral system and stakeholders as well as debates and explanations of these concepts from different perspectives.

5.3. Methodology

The study adopted a multiple-sample survey design in the case of the quantitative approach and a case study in the case of the qualitative approach. The study adopted the mixed methods research approach. The sampling techniques that were employed in the data collection include: cluster, purposive and snowball sampling techniques. The cluster sampling technique was used to put the Metropolis into two larger clusters. Snowball sampling technique was employed to select twenty (20) registered voters who have taken part in two general elections from the sampled twenty (20) Electoral Areas which then was given a sample size of four hundred (400) registered voters for the study. The purposive sampling was used to select fourteen (14) Temporal Staff to form the focus group members from only seven of the forty-one different Electoral Areas.

The Statistical Package for Social Sciences (SPSS) and Excel 2007 were used to analyse the field data collected through the use of the questionnaire, and in the case of the focus group interview; collected data was thematically analysed. Participants used in the study had understanding of the purpose of the research.

5.4. Key Findings

A number of key findings were made in accordance with the objectives that were initially set out in the study. The areas of the key findings in line with the study objectives include the following;



5.4.1. Trajectory of Technological Innovations

The study revealed that the electorate had an idea that, since the inception of the electoral principle in Ghana, the introduction of reforms to the electoral process has become a permanent feature. It was found that the electorates are very conscious of these reforms and the technological innovations that come along with them. The electorates were able to outline some of the changes they have witnessed over the years including; changing of the opaque ballot box to transparent ballot, the issuance of photo and thumbprint voter identification cards to the current biometric technology which is deployed in the registration and identification of voters during elections.

The study was able to establish the knowledge of electorates in the kind of technological innovations the Electoral Commission has deployed to reform the processes, especially coming on the heels of the disputed 1992 Presidential Elections by stating some of the electoral services that are now available to them at the various District Offices of the Electoral Commission to include; the reprinting of voter identification cards and changing of their particulars in both the register and voter identification card as services provided by technological innovations.

5.4.2. Calibre of Human Resources

The study found that the calibre of human resources engaged by the Electoral Commission over the years to handle technological innovations have inadequate knowledge and skills. There were however, mixed reactions with regard to the competence and profession conduct of Temporal Staff. In terms of competence, the study revealed that Temporal Staffs were not equipped with adequate knowledge and skills to handle technological innovations to undertake the registration of voters and conduct of elections. It was also revealed that some Temporal



Staff lacked emotional competence in the wake of handling difficult situations such as stakeholder agitation and simple troubleshooting when confronted with technical glitches.

On the level of professional, it was discovered that some Temporal Staffs have failed to execute task in line with laid down rules and regulations which often bring into question their professional abilities. It was revealed that there was blatant disregard for electoral laws by some Temporal Staff which often lead to stakeholder agitation during and after electoral activities. The study also found that Temporal Staff in most cases failed to handle the concerns of the electorate in a professional manner as well as maintaining political neutrality in the execution of task assigned to them. It was therefore concluded that Temporal Staff of the Electoral Commission are incompetent and below expectation.

5.4.3. Stakeholders Embracing or Reception of Technological Innovations

The found that stakeholders have embraced the technology used for elections but the findings were that its introduction will not completely reduce stakeholder agitations. It was revealed that some calls for reform of the electoral process, especially reforms that require the use of technological innovations often emanates from stakeholders especially the political parties.

This is a testimony of their faith in these innovations and their preparedness to embrace them.

It was found that the introduction of the biometric technology in the reform process in the 2012 General Elections was a result of calls from the Opposition Political Parties and a section of Civil Society Organisations. These calls the study found, were predicated on their belief that technological innovations have the potential to either completely eliminate or reduce some of the challenges that bedeviled the previous systems. The study further revealed that the electorates who are its main focus has so far not shown any sign of resistance towards the deployment of these technological innovations.



5.4.4. Capacity of the Electoral Commission

The study also found that the Electoral Commission have inadequate local infrastructure capable of supporting the adoption of new technological innovations. The study identified among other things, the lack of well-furnished District Offices in most Districts of the country, lack of internet connectivity to link up these offices for easy communication and the absence of permanent Technical Staff at the District Offices of the Electoral Commission to operate and maintain these innovations. The study found that apart from these ill-equipped District Offices, the installed technological innovations are left in the hands of Temporal Staff referred to as Technicians/Key Trainers. Most of these Technicians have no background in Information and Communication Technology (ICT) but usually selected based on other considerations. The study also concludes that budgetary allocation to the Electoral Commission impedes its capacity to deploy modern technological innovations.

5.4.5. Appropriateness of Technological Innovations

The study revealed that the Electoral Commission has over the years used technological innovations that are appropriate for its activities. It was found that because the Electoral Commission has always have the opportunity of test-running these innovations through various limited pilot programmes before deployment, it is in a better position to select innovations that are appropriate, given the literacy level of the larger Ghanaian population and the prevailing weather condition.

5.5. Conclusion

From the study, it can be concluded that technological innovations in electoral reforms in the democratic governance process has been positive. The general consensus among the electorates was that the deployment of technological innovations has led to the improvement



in our electoral and governance processes. This adoption of technological innovation have promoted citizens participation in the electoral process since technology is able to capture a large segment of the population with its large storage devices compared with the manual system. Through technological innovations, the electorate and the general population are able to access relevant information that help them in the selection of their leaders and also participate by making inputs in the governance processes. Technological innovations continue to improve security in the electoral process thereby enhancing the principles of transparency, free and fair elections.

5.6. Recommendations

Having highlighted the key findings on the role of technological innovations in electoral reforms in Ghana's democratic governance process within the Tamale Metropolis, the following recommendations are made on the basis of these findings:

1. Public Education on Ghana's Electoral System and Process

The Electoral Commission should collaborate with other state institutions such as the National Commission for Civic Education (NCCE), the Information Services Department (ISD) and Educational Institutions to undertake public education programmes on Ghana's electoral system and electoral process and the various technological innovations that are deployed to implement these processes as well as those that are being considered for future adoption. By this much awareness would be created and participation rate increased.

2. Increase Funding For Local Infrastructure Development



Funding to the Electoral Commission should be increased to enable it build its local infrastructure through the procurement of well-furnished District Offices that are capable of securely accommodating these technological innovations. The timely release of the right budgetary allocation would enable the Electoral Commission to procure these innovations as well as hire the services of permanent experts to run and maintain them at the various District Offices.

3. Improve the Recruitment and Training of Temporal Staff

The Electoral Commission should also take the recruitment and training of Temporal Staff seriously. Minimum qualifications for Temporal Staff who manage these innovations at the Polling Stations should be increased and restricted to persons who have educational background in Information and Communication Technology (ICT). The Electoral Commission should also collaborate with organisations that have the expertise in organizing training programmes to roll out programmes that will address the skills requirement of its Temporal Staff. This would go a long to guarantee the professional competence of these Officials.

4. Electoral Commission Should undertake Training and Consultation Outside the Electoral Calendar

It is also recommended that, the Electoral Commission should on a continuous basis undertake simulation programmes outside the electoral calendar as a constant reminder to stakeholders, especially the workings of these technological innovations. These simulation exercises can also serve as a platform to sharpen the skills of its Permanent Staff.

5. Improve the Remuneration of Temporal Staff



Remuneration to Temporal Staff should also be reviewed upwards to attract qualified persons with the requisite background to develop interest in working for the Electoral Commission.

5.7. Suggestions for Further Research


It was evident in the research findings that there is a need for further research regarding the role of technological innovations in Electoral Reforms and Good Democratic Governance in Tamale Metropolis, Ghana. It is such a vital issue that should be given necessary attention if not achievements in technological innovations in electoral reforms and good democratic governance would not be measured properly. Therefore, other researchers could go beyond one Metropolis as these findings highlighted to cover the entire nation and all stakeholders in the electoral process unlike what this current study has done.


It is therefore suggested that researchers could look at issues like:


- I. The role of political parties in promoting the adoption of technological innovations in the electoral process,
- II. Factors acting as barriers to full time employment at the Electoral Commission,
- III. The motivational levels of Electoral Commission staff in the metropolis and
- IV. Mechanisms for successful implementation of technological innovation in the electoral process.



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APPENDICES

APPENDIX A: QUESTIONNAIRES

Introduction

The purpose of this questionnaire is to assess the perceptions of stakeholders in the Ghana’s Electoral Process on the application of technological innovations in the introduction of electoral reforms and good democratic governance in Ghana and Tamale Metropolis in particular. The result for this study is strictly for academic purposes and its target population is registered voters within the Tamale Metropolis who have at least taken part in two general elections.

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Questionnaire Serial Number.....

Name of Interviewer.....

Date of Interview.....

Time of Interview: Start.....



A. Are you a registered voter? 1. Yes [] 2. No []

B. Have you taken part in two general elections? 1. Yes [] 2. No []

If a respondent answers *NO* to questions **A** and **B**, discontinue the interview since the survey is intended to cover ***ONLY REGISTERED VOTERS.***

BIO-DATA

Indicate by a *TICK [✓]* any of the responses that describe you.

A. Sex 1. Male [] 2. Female []

- B. Age:
- 1. 18 to 30yrs []
 - 2. 31 to 45yrs []
 - 3. 46 to 64yrs []
 - 4. 65yrs and above []

C. Highest Educational Qualification

- 1. Primary School []
- 2. Secondary School []
- 3. Tertiary Institution []
- 4. Others Specify.....

SECTION A

1.0 TRAJECTORY OF TECHNOLOGICAL INNOVATIONS IN ELECTORAL REFORMS IN GHANA

1.1 Do you have any idea that the EC has been using technological innovations in the implementation of electoral reforms? 1. Yes [] 2. No []



1.2 If yes, can you tell during which year's elections you started seeing technological innovations during the registration of voters and voting?.....,,

1.3. What type of equipment do you see at the polling stations during registration and voting?

- TICK [√]
- 1. Laptop Computers []
 - 2. Fingerprint Scanners []
 - 3. Printers []

4. Cameras []

5. Biometric Verification Device []

1.4 Do you think the technological innovations so far deploying in the implementation of electoral reforms has help to improve the electoral process

SECTION B

2.0 CALIBRE OF HUMAN RESOURCES INVOLVED IN THE USE TECHNOLOGICAL INNOVATIONS IN ELECTIONS

The questions in this section are aimed at assessing the general perceptions of the electorate on the EC staff who attend to them at the polling stations. **Tick** [✓] where appropriate.

2.1. Do you think the temporal staffs of the EC are competent enough to handle the technology use in elections? 1. Yes [] 2. No. []

2.2. Do you think the EC officials were professional in handling both the registration and voting equipment? 1. Yes [] 2. No []

2.3. In your view, will you associate the problems that came up during the elections to poor handling by the EC staff? 1. Yes [] 2. No. []

2.4. In your opinion, do you think that the temporal staffs employed by the EC to operate the registration and voting equipment followed the instructions?

1. Yes [] 2. No []

2.4. Do you think the EC has been giving enough training to its temporal staff on the use of the technological innovations? 1. Yes [] No. []



2.5. Indicate which one of these two areas in technology application in elections you

Think the EC staffs were more professional? 1. Registration [] 2. Voting []

2.6. Have you ever had any difficulty dealing with any EC official during registration

or voting as a result of his or her inability to process you? 1. Yes [] 2. No []

2.7. If yes, could state the nature of the problem.....

.....
.....

2.8. Do you think that the EC staffs has the emotional competence to deal with the electorate in the event of a breakdown of the registration or voting equipment?

1. Yes [] 2. No []

2.9. Do you think the attitude of the EC officials during registration and voting has helped in making the electoral process acceptable? 1. Yes [] 2. No. []

2.10. Generally, how will you describe the EC officials who operate both the voting and registration equipment at the polling stations?

- 1. Professional []
- 2. Competent []
- 3. Not Competent []
- 4. Below Standard []



SECTION C

3.0.STAKEHOLDERS EMBRACING TECHNOLOGY IN ELECTORAL REFORMS

The following questions are aimed at assessing whether the application of technological innovations in electoral reforms is embraced by stakeholders. **A=Agree, D.A= Disagree, UNC=Uncertain. Tick [√]** the column appropriate to your choice.

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EMBRA -CING	DIMENSIONS	1 A	2 D.A	3 UNC
E1	Using technological innovations in electoral reforms will improve the efficiency and effectiveness of EC			
E2	Introduction of technology may not necessary improve the electoral process.			
E3	Voters will have great difficulty if all the electoral activities are computerised.			
E4	Technological innovations have brought about more transparency in the electoral process.			
E5	Technological innovations have made Political parties and citizen's participation in the electoral process most convenient.			
E6	The introduction of technology can reduce election related violence.			
	The use of modern technology will prevent rigging and			

E7	ensures the secrecy of voting.			
E8	Computerization of electoral process will prevent many people from participation in the electoral process.			

SECTION D

4.0.APPROPRIATENESS OF TECHNOLOGICAL INNOVATIONS IN ELECTORAL REFORMS

The set of questions below relates to your perception of the appropriateness or otherwise of the technology been used in elections. In like manner as you answered Section A, answer the questions below. . **A=Agree, D.A= Disagree, UNC=Uncertain. Tick [√] the column appropriate to your choice.**

APPRO- PRIATE -NESS	DIMENSION	1	2	3
		A	D.A	UNC
A1	Technological innovations such as radio, television, internet and social media provides more information on the electoral process and good democratic governance in Ghana.			
A2	The introduction of biometric registration system was very appropriate.			





A3	It was very easy for me going through the biometric registration process.			
A4	I observe or heard a lot of complains about the biometric registration equipment.			
A5	The new voter ID card was better than the previous one due to the new machine used.			
A6	Voter verification process is easy with the application of technological innovations			
A7	The application of technological innovations has made the electoral process more friendly			
A8	Technological innovations used in the reform process offers stakeholders more information on the electoral process than the manual process			
A9	The technological innovations used by the EC are more appropriate for the weather conditions in the country.			
A10	The EC has readily available parts to immediately replace broken down equipment.			
A11	All stakeholders are able to use both registration and voting equipment without difficulty			

SECTION E

5.0 CAPACITY OF THE EC IN ADOPTING TECHNOLOGICAL INNOVATIONS

5.1 Do you think the EC has the local infrastructure capable of supporting the adoption of new technological innovations? 1. Yes [] 2. No. []

5.2 In your view, would you say the EC has the technical capacity to implement electoral reforms aided by technological innovations? 1. Yes [] 2. No []

5.3 Do you think the EC has been properly resourced to procure the right technologies for elections? 1. Yes [] 2. No []

5.4 Has the EC the appropriate skilled staff to run and maintain technological innovations?
1. Yes [] 2. No []

5.5. What do you consider to be the cause of stakeholder agitation after every election in Ghana?

.....
.....

SECTION F

Now, provide answers to each of the following questions in the space provided:

7. Could you please give reasons why you think the EC were not professionals in handling registrations and voting equipment



.....
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.....

8. Why were the EC staffs more professionals in technology application in their registration process?

.....
.....

9. Why were the EC staffs more professionals in technology application in their voting process?

.....
.....
.....
.....

10. Do you think the EC staff has the emotional competence to deal with the electorate in the event of a breakdown of the registration or voting equipment?

.....
.....
.....
.....

11. Do you think the attitude of the EC officials during registration and voting has helped in making the electoral process acceptable? Explain your answer.



.....
.....
.....

12. What do you consider to be the cause of stakeholder agitations after every election in Ghana?

.....
.....
.....

4.3.6 Do you think the impacts of technological innovations were considered before their introduction? Give your reasons.

.....
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.....
.....

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13. Do you think the EC has put measures to ensure the security of the system? Give your reasons.

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14. Do you trust the accuracy of results produced by the use of technological innovations in elections?

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15. How would you link stakeholders complain after elections to technological innovations?

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16. Do you think stakeholders are receptive to technological innovations?

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.....

.....

.....

THANKS FOR YOUR PARTICIPATION



APPENDIX B: FOCUS GROUP INTERVIEW SCHEDULE

1. Briefly state if you have any ideas of technological innovations the Electoral Commission has been using in the implementation of its programmes.

2. Do you think the calibre temporal staff the EC usually engage to handle these technological innovations often have the requisite skills?

3. State briefly whether you think that stakeholders in the electoral process have embraced the technological innovations and consider them appropriate.

4. State briefly your views on whether the EC has the capacity in adopting these technological innovations.

5. In your general assessment, how would you assess technological innovations in the implementation of electoral reforms and good democratic governance in Ghana?

