E-VOTING SYSTEM ADOPTION AND ITS IMPACT ON VOTER TURNOUT IN NIGERIA

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ABSTRAK

Sistem pengundian sedia ada menggunakan kertas undi di Nigeria sedang berhadapan dengan pelbagai cabaran. Antaranya termasuklah pengundian berganda, pengundian oleh pengundi di bawah umur, ugutan terhadap pengundi, kesilapan atau pemalsuan keputusan pilihanraya. Kesan daripada sistem pengundian yang bermasalah boleh membawa kepada sikap ketidakpedulian politik dan menjejaskan bilangan pengundi keluar mengundi. Oleh itu, kerajaan merancang untuk memperkenalkan sistem e-pengundian untuk tujuan memperkukuhkan sistem pilihanraya supaya bebas, adil dan boleh dipercayai serta meningkatkan bilangan pengundi keluar mengundi. Walau bagaimanapun, sistem e-pengundian boleh menjadi penyelesaian kepada masalah bilangan keluar mengundi yang rendah jika ia dapat mempengaruhi para pengundi untuk mengambil bahagian dalam pilihanraya. Oleh itu, kajian ini bertujuan untuk meneliti faktor-faktor yang mempengaruhi penggunaan teknologi e-pengundian dan kesannya terhadap peratusan keluar mengundi. Kajian ini membangunkan satu model penyertaan dalam pilihanraya melalui sistem e-pilihanraya dengan menggabungkan teori-teori Pilihan Rasional, Difusi Teknologi, Model Trust dan konstruk Self-efficacy. Dengan menggunakan kaedah gabungan temuduga separa berstruktur dan survei, data dikumpulkan daripada pengundi, pegawai-pegawai pilihanraya dan parti politik di tiga buah negeri di bahagian timur laut Nigeria. Dengan menggunakan pendekatan PLS-SEM, model kajian menunjukkan pengaruh pembolehubah sifat-sifat teknologi, pembolehubah keyakinan dan kecekapan-kendiri komputer sebagai penentu-penentu penting terhadap niat untuk menyertai pilihanraya yang menggunakan teknologi e-pengundian Tambahan pula, kajian ini mendapati pembolehubah penggunaan dapat mempengaruhi keputusan rasional pengundi untuk mengambil bahagian dalam pilihanraya yang menggunakan teknologi e-pengundian. Antara potensi cabaran bagi penggunaan e-pengundian yang dikenal pasti melalui analisis tematik termasuk cabaran-cabaran institusi, sosio-psikologi, teknologi dan infrastruktur, manakala pengukuhan kerangka institusi, penguasaan teknologi, penyebaran maklumat yang berkesan dan penyediaan kemudahan yang mencukupi telah dikenal pasti sebagai antara langkah-langkah untuk menangani cabaran pelaksanaan e-pengundian. Kajian ini menyumbang kepada teori dan amalan sistem maklumat serta penyertaan dalam demokrasi dan dasar awam. Ia juga menyediakan pembuat dan pelaksana dasar dengan pemahaman mengenai penggunaan e-pengundian untuk melaksanakan perancangan strategik dan membuat keputusan mengenai sistem pengundian yang dikehendaki untuk meningkatkan penyertaan politik.

Kata kunci: e-Pengundian, Teori Pilihan Rasional, Difusi Teknologi, Nigeria.

ABSTRCT

There are numerous problems ascribed to the existing ballot paper voting system in Nigeria. Some of the identified problems include multiple voting, under aged voting, intimidation of voters and miscomputation or falsification of election results. The consequences of the flawed voting system often lead to political apathy as well as decreased voter turnout. Consequently, the government plans to introduce e-voting system in order to enhance free, fair and credible elections as well as improve voter turnout. However, the e-voting system could be a solution to the problem of low turnout if it influences the electorates to participate in elections. Thus, this study is aimed at investigating factors that influence e-voting system adoption and its impact on voter turnout. By blending theories of Rational Choice, Diffusion of Innovation, Trust Model and Self-efficacy construct, the study conceptualized a model of election participation using e-voting system. Using combined methods of survey instrument and semi-structured interviews, data were collected from voters, government officials and political party officials across three States of the Northeastern Nigeria. Using PLS-SEM approach, the model demonstrated significant influence of technological attributes, trust and computer self-efficacy variables as determinants of intention to adopt e-voting system. In addition, the study demonstrated the significance of the adoption variables in influencing voter rational decision to participate in election using e-voting system. Potential challenges of e-voting adoption identified through thematic analysis include institutional, socio-psychological, technological and infrastructural challenges, while strengthening institutional framework, technological proficiency, effective information dissemination and provision of adequate requisite facilities were identified among other remedies to the challenges of e-voting adoption. The study has significant contributions to theory and practice of information system, participatory public policy and democracy. It also provides policy makers and practitioners with the understanding of e-voting adoption for strategic planning and decisions towards the desired voting system.

Keywords: e-Voting Adoption, Intention to Participate in Election, Voter Turnout, Rational Choice Theory, Nigeria.

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DECLARATION

I declare that this thesis is my original work except for the quotations and citations, which have been fully acknowledged. I also declare that it has not been previously and is not concurrently submitted for other degree at the Universiti Utara Malaysia or any other institution.

DEDICATION

I dedicated this research work to my beloved mother, Zainab Bt Hassan

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LIST OF ABBREVIATIONS

ACE	Alliance for Credible Election
AFIS	Automated Fingerprint Identification System
ASE	Assisted self-efficacy
AVE	Average variance extracted
BelS	Belief systems
BPO	Bureaucratic policy orientation
CFA	Confirmatory factor analysis
CIA	Central Intelligence Agency
CompL	Computer literacy
ConsC	Constitutional control
CSE	Computer Self-efficacy
DDCM	Direct Data Capture Machine
df	Degree of freedom
DigD	Digital divides
DoI	Diffusion of Innovation
DRE	Direct Recording Electronic
DV	Dependent variable
ECN	Electoral Commission of Nigeria
ElecS	Electricity supply
EMB	Electoral Management Body
E-Official	Electoral official
e-Voting	Electronic voting
f^2	Effect size
FCT	Federal Capital Territory, Abuja
FEC	Federal Electoral Commission
FEDECO	Federal Electoral Commission
FRN	Federal Republic of Nigeria
G2B	Government to Business
G2C	Government to Citizens
G2E	Government to Employees
G2G	Government to Government
GAIS	Government administration information system
GDP	Gross Domestic Product
GSGSG	Ghazali Shafie Graduate School of Government
ICT	Information and communication technology
IDEA	International Institute for Democracy and Electoral Assistance
IDT	Innovation Diffusion Theory
IFES	International Foundation for Election Systems

Illit	Illiteracy
INEC	Independent National Electoral Commission
InInf	Inadequate information
IS	Information system
ISE	Individual self-efficacy
ITP	Intention to Participate
IV	Independent variable
i-Voting	Internet voting
MMS	Multimedia Message Service
MPCU	Model of PC Utilization
MVA	Missing value analysis
NAN	News Agency of Nigeria
NCA	Nigerian Communication Act
NEC	National Electoral Commission
NECON	National Electoral Commission of Nigeria
NITDA	National Information Technology Development Agency
NTP	National Telecommunication Policy
NYSC	National Youth Service Corps
OBS	Perceived Observability
OMR	Optical Mark Reader
OSBS	Open Secret Ballot System
OYAGSB	Othman Yeop Abdullah Graduate School of Business
PATU	Perceived Ability to Use
Pc	Composite reliability
PCI	Perceived Characteristics of Innovation
PEOU	Perceived ease of use
PFB	Perceived functional benefit
PLS	Partial Least Square
PLS-SEM	Partial Least Square – Structural Equation Model
P-Official	Party official
PSNet	Public Service Network
PU	Perceived usefulness
Q^2	Predictive relevance
R^2	Coefficient of determination
RA	Relative advantage
RECs	Resident Electoral Commissioners
ReqF	Requisite facilities
RERC	Registration and Election Review Committee
REVS	Remote electronic voting system
SET	Self-Efficacy Theory

TAM	Technology Adoption Model
TechC	Technical capacity
TEI	The Electoral Institute
TEO	Trust in the Electoral Government Officials
TIT	Trust in the Technology
TPB	Theory of Planned Behavior
TRA	Theory of Reason Action
TRB	Perceived Trialability
UN	United Nation
UTAUT	Unified Theory of Acceptance and Use of Technology
UUM	Universiti Utara Malaysia
VAP	Voting age population
VIF	Variance inflation factor
β	Standardized path coefficient

CHAPTER ONE

INTRODUCTION

1.1 Introduction

In Nigeria, e-applications in both private and public sector organizations are at various stage of evolution. Stream of literature have reported instant development of such e-applications. For instance, e-banking has been the most favored private sector with remarkably advanced stage of e-application (e.g. Agwu, Atuma, Ikpefan, & Iyoha, 2014; Agwu & Carter, 2014; Shaikh & Karjaluoto, 2015; DASH & Tech, 2014). Other areas receiving increasing attention include e-commerce (Egbokhare, Ukaoha, & Chiemeke, 2011; Ayo, Adewoye, & Oni, 2011; Gholami, Ogun, Koh, & Lim, 2010).

Inversely to private sector organizations, e-application in public sector also known as e-government is at evolving stage and is only beginning to be researched (Amagoh, 2015). Example of areas receiving attention on e-application in public sector include e-learning (Edewor, Imhonopi, & Urim, 2014; Ayeni & Odion, 2011), e-recruitment (Odumeru, 2012; Omolawal, 2015; Sanusi, & Martadha, 2012; Sanusi & Mohamed, 2012) and e-licencing (Obidinnu, Ekechukwu, & Ejiofor, 2013; Faniran & Olaniyan, 2009). Although recent development of e-voting adoption in Nigeria attracts a stream of literature (Adebayo, Ugiomoh, & AbdulMalik, 2013; Ahmad, Abdullah, & Arshad, 2015a; Ahmad, Abdullah, & Arshad, 2015b; Ayo, Adebiyi, & Fatudimu, 2008; Ayo & Ekong, 2008), paucity of emperical study is evident thereby craving for more investiagtion.

Literature emphasizes that development and implementation of new system as the use of electronic devices in election has the potential to improve the election processes, and engender citizens' participation in elections. This is considering information and communication technology (ICT) introduces new discourse in public organization through which the challenges of governance such as lack of inclusion, poor participation, poor accountability and corrupt practices can be tamed (Adesola, 2012; Gano, 2013). The basic point of argument is that the democratic participation (election) to a larger extend, depends on the level of the openness of the (election) process (Gano, 2013).

Legitimization of government and any of its action entails that the processes of selecting the leaders have to be as participatory as possible. For governance to be participatory means it has to be transparent, which can be possible only through making information readily available and accessible. Application of ICT into various aspects of government processes brings about the relevance of e-voting system to improve voting system and voter participation.

Electronic voting or e-voting entails the use of electronic devices to facilitate election processes. Although, a generic term that encompasses various electronically enhanced technique of voting, e-voting rooted from a component of the broader field of electronic government and electronic democracy, also known as e-government and e-democracy respectively. Information System (IS) is the hallmark throughout the cycle of electoral process.

Various countries around the globe have been exploring the capabilities of electronic devices to improve electoral processes based on their peculiar needs and development, and

as a response to inadequacies inherent in the traditional paper voting system (Goldsmith, 2012). In tandem with technological advancement, use of voting technology in United States of America (USA) evolved from Mechanical Lever Action Voting Machines in 1920s through to Punch Card Machines in 1950 to Optical Scan Machine in 1980. Electronic Voting Machine was developed in 2000 while in 2006 Touch Screen was adopted in some States (Bellis, n.d.).

The digital revolution and indeed widespread adoption of e-voting system in USA can be ascribed to the problems of precinct-card ballot surrounding the 2000 presidential election recount. The recount caused election experts to call into question, delusion of punch-card ballots, which was the basis for the Help America Vote Act (HAVA) as a new legislation that was signed into law in October 2002 to overhaul America's electoral system. Using HAVA fund, it was reported that nearly 700 counties in more than half States of USA used Direct Recording Electronic (DRE) machines and optical scanning technology in the 2004 general election (Arrison & Vasquez, 2006). The resultant impact of using the DRE was cut in the rate of voter-ballot mistakes to nearly half of 2000 election.

However, identified weaknesses of DRE bordering around reliability and security eventually led to adoption of new technology called Secure Electronic Registration and Voting Experiment (SERVE) designed to allow approximately up to 100,000 American voters overseas to vote in the November 2004 presidential elections from anywhere in the world, entirely electronically via the Internet. With development of SERVE, internet voting (I-voting) technology has become emerging alternative voting system that continue to receive considerable attention among researchers on USA voting process till date (Arrison & Vasquez, 2006).

Beside USA, other countries across the globe continue to explore the use of e-voting system based on peculiar needs and development, and as a response to inadequacies inherent in the traditional paper voting system (Goldsmith, 2012). Table 1.1 below shows a quick-glance status of countries with e-voting project as at January 2010 based on Peter Wolf and other contributors in aceproject.org,

Table 1.1

Countries with e-Voting Project

e-Voting Status	**Country**
Legally binding electronic voting with voting machines (polling place)	**Australia**, Brazil, Canada, France, India, Japan, Kazakhstan, Peru, Russia, United Arab Emirates, United States of America, Venezuela
Legally binding internet voting (remote voting)	Austria, Australia, Canada, Estonia, France, Japan, Switzerland
Planning, trials, non-legally binding e-voting	Argentina, Azerbaijan, Belarus, Bulgaria, Chile, Czech Republic, Finland, Greece, Italy, Latvia, Lithuania, Mexico, Nepal, Nigeria, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, South Africa, Spain, South Korea, Sweden
e-Voting projects stopped	Germany, Ireland, Netherlands, United Kingdom
Trials and pilots	Peru and Costa Rica

Source: Wolf (2010)

Account of countries with e-voting project status as at January 2010, according to the Table 1.1 above, Wolf (2012) mentioned Nigeria among the category of countries with planning, trials, non-legally binding e-voting project, a very crucial stage of adoption.

It is essentially importance to consider various factors while assessing e-voting system adopting as panacea to decrease voter turnout. The basic question raised is whether e-voting adoption can influence cognitive decision of a voter to participate in election. This is because, various countries have at a point, discontinued using e-voting system of election

due to issues related to trust and decline in participation. Empirical evidence indicated that imposing e-voting system void of careful assessment of voter willingness to participate in elections using the system may lead to decline in voter turnout.

In Germany for example, introducing electronic voting led to significant drop in political participation from 87.7% in 1961 to 70.8% in the 2009 elections. This, and consequent to a campaign to stop spread of e-voting by German hacker-cum-data-protection group Chaos Computer Club and Dutch foundation 'Wij vertrouwen stemcomputers niet' (We don't trust voting computers), in 2009, Germany's court declared the use of e-voting election unconstitutional because it lacks the basic transparent counting. Similarly, after several decades of increasing use of e-voting machines, in 2008, Netherlands decertified use of the machines and resolved back to paper balloting.

Moreover, in the same year (2008), the Dutch government decertified the use of paperless systems and rejected a proposal to develop a new generation of voting computers. Furthermore, following a report in 2004 that e-voting lacks public trust and security, in 2010, Irish government dumped €52 million worth of e-voting equipment that were used only for a small pilot project. Due to exorbitant costs of the technology, Australia discontinued its hailed open e-voting software (Okaka, 2014).

England, in 2008, stated that e-voting pilots were "extremely expensive and there is no evidence to suggest that e-voting offers any significant scope for turnout to be increased by this means" and that, "Serious concerns persist about the security and transparency of e-voting systems and their vulnerability to organised fraud" (Oates, 2008).

In the diffusion process, system adoption is significantly related to the extent to which various categories of users are involved at the early phase of the policy and implementation of technologies (Cherkasky, Greenbaum, Mambrey, & Pors, 2000; Greenbaum & Kyng, 1991; Schuler & Namioka, 1993), and hence; the need to facilitate research to support policy framework and minimize potential problems. Although, full-fledged e-voting is yet to be adopted as conventional method of election in Nigeria, nevertheless, various aspects of e-voting such as e-voter registration and e-verification (e-card reader) have started to be used towards the journey to a full-fledged e-voting system (Durotoye, 2015).

Despite the seeming problems of the traditional paper ballot voting system and the potentials of e-voting system in turning around decrease in voter turnout, e-voting adoption in relation to how it affect voter participation in election in Nigerian democratic system is only beginning to be researched and understood. This empirical study adopted mix research method to study impact of e-voting adoption on voter turnout. The study developed and validated a multidimensional yet parsimonious model of voters' intention to participation in elections using e-voting system (ITP). It also explored factors that impose voting costs in relation to e-voting adoption. The study provides supportive framework for public policy and administrative decisions related to voting processes capable of improving the design of future voting systems, and increase voter turnout. The study is designed to extend the existing body of knowledge related to e-voting adoption and voter turnout.

1.2 Problem Statement

"Fraud, intimidation, and illegal exclusions are obvious ways in which elections can be rendered less democratic" (Norton, 2009, p 1). Elections in several African countries, Nigeria inclusive suffered from the setback of participation deficit. In such countries, elections are far from being free and fair, and instead, are often marred by irregularities. Available literatures have shown problems of different shapes and magnitude characterizing elections in Nigeria. Foremost among such heaps of problems are associated with the performance of the voting system including but not limited to difficulties of voters' registration/accreditation, and of voting; voter fatigue, underaged and multiple voting; voting by non-eligible persons, and miscomputation of results. Other problems include stuffing and or disappearance of ballot boxes, distortion or fabricating of election results, and intimidation of voters (Abdulhamid, Adebayo, Ugiomoh, & AbdulMalik, 2013; Adeleke, 2015; Durotoye, 2015; Onimisi, 2015; RERC, 2012).

The intensity of the voting system induced election-associated problems repudiates the conventional principles of democracy that stipulate actual votes cast as the ultimate determinant for electoral victory. In contrast, winners and losers of elections are often predetermined even before the contest, only for voters to go through the charade of confirming choices that are considered foregone conclusion (Agbaje & Adejumobi, 2006; Durotoye, 2015; Alemika, 2011; Agbor, Okoro, & Adams, 2011).

The consequence of flawed voting system often exposed the elections to serious defects of voter apathy and decrease in voter turnout since the return to democratic governance in 1999 (Awopeju, 2012; Collier & Vicente, 2014; Ejue & Ekanem, 2011; Mahmud, 2015;

Yakubu, 2012). Unlike citizens of advanced democracies who often engage in various forms of political participation, most political systems of democratizing countries regard several forms of participation inimical to constituted authorities. Thus, voters' turnout remains the most common form of assessing political participation in most democratizing societies (Mahmud, 2015). In this regard, the International Institute for Democracy and Electoral Assistance [International IDEA], 2015) provided empirical evidence of voter apathy, indicating swift decrease in voters' turnout in both presidential and parliamentary elections.

Table 1.2

Voters Turnout from 1999 – 2015 (Presidential Elections)

Year	Population	Voting Age Population	Registration	Total Votes	Voter Turnout	VAP Turnout	Invalid Votes
1999	108,258,359	52,792,781	57,938,945	30,280,052	52.26%	57.36%	1.40%
2003	129,934,911	64,319,246	60,823,022	42,018,735	69.08%	65.33%	6%
2007	131,859,731	71,004,507	61,567,036	35,397,517	57.49%	49.85%	-
2011	155,215,573	81,691,751	73,528,040	39,469,484	53.68%	48.32%	3.19%
2015	181,562,056	91,669,312	67,422,005	29,432,083	43.65%	32.11%	2.87%

Source: International IDEA (2015)

Table 1.2 has indicated continued decrease in voter turnout for presidential elections from 69.08% in 2003 to 57.4% in 2007 and down to 53.68% in 2011 and 43.65% in 2015 while the voting age population (VAP) participation diminished from 65.33% in 2003 to 48.32% in 2011 and further moderated to 32.11% in 2015.

Table 1.3

Voters Turnout from 1999 – 2015 (Parliamentary Elections)

Year	Population	Voting Age Population	Registration	Total Votes	Voter Turnout	VAP Turnout	Invalid Votes
1999	108,258,359	52,792,781	57,938,945	23,573,407	40.69%	44.65%	2.40%
2003	129,934,911	64,319,246	60,823,022	29,995,171	49.32%	46.63%	3.20%
2007	131,859,731	71,004,507	61,567,036	-	-	-	-
2011	155,215,573	81,691,751	73,528,040	21,074,621	28.66%	25.80%	-
2015	181,562,056	91,669,312	67,422,005	29,432,083	43.65%	32.11%	

Source: International IDEA (2015)

Similarly, Table 1.3 depicted slash in voter turnout for parliamentary elections from 49.32% in 2003 to 43.65% in 2015 while VAP decreased from 46.63% in 2003 to 32.11% in 2015.

It is therefore assertive that the backslide is an indication of political apathy, abstention from political activity as well as decrease in voter turnout (INEC & FES Nigeria, 2011; Mahmud, 2015; Yakubu, 2012). Owing to the facts that the multitude problems are clear manifestations of critical challenges to the existing voting system, the mind-boggling question is whether e-voting system can influence voter cognitive decision to vote thereby resuscitates the already depleted election participation?

Quest for relevant voting system that can upturn the prevailing trend of voter apathy and decrease voting participation has been the most contentious issues generating debates in the Nigerian political discourse most especially between and among members of executive, parliament, technocrats and party stalwarts. Central to this debate is adoption of e-voting system of election. Optimists welcome the development and expressed support. However, pessimists cast serious doubt over the idea of e-voting adoption, questioning the capacity

of government to manage such a highly technical and capital extensive project amidst dearth of infrastructure and low level of technological proficiency among the electorates (Adeleke, 2015; Aborisade, 2014; Folasade-Koyi, 2014).

Furthermore, scholars and practitioners argued that traditional paper system of voting lies at the center of the problems of elections in Nigeria (Faniran & Olaniyan, 2011; Olaniyi, et al., 2011; Onyekwelu, 2010; Reginald, 2015; Salam, 2012). Subjecting paper voting system to vehement criticism, scholars appealed for e-voting adoption as the best platform with potentials to provide window of solutions to the irregularities associated with the existing system of voting (Abdulhamid et al., 2013; Ariyomo, 2012; Ayo, Adebiyi, & Sofoluwe, 2008; Erubami, 2012; LeVan & Ukata, 2012; Reginald, 2015; Salam, 2012) as well as increase election participation. (Kozakova, 2011, p 10) postulated, "the easier voting becomes for citizens the more likely they are to participate in elections".

Consequently, e-voting adoption models started to emerge. However, the existing models are conceptually inclined than empirical and often focused on e-voting adoption from macro organizational viewpoint, emphasizing on assessment of the capability of e-voting to enhance smooth conduct of elections (Salimonu, Wan Rozaini, Abdul Jaleel, & Jimoh, 2013). However, exisitng e-voting researches and studies rarely focus on individual voter perspective of e-voting as determinant of adoption and how adoption affects voting participation decision. e-Voting would be meaningless if the electorates (voters) are not willing to participate in the election using the system (Fernandez, La Red, & Peláez, 2013; Navarra, 2011). It is worth emphasizing that understanding voter willingness to accept e-voting system, and how it affects voter turnout has created an avenue for a new discourse that required evaluation through inquiry.

One major reason for poor performance of e-voting system as panacea to decrease voter turnout is the inadequate accessible data for evaluation (Kozakova, 2011). Going by adoption literature, assessing appealing characteristics of the e-voting system are important criteria for citizens rational choice aiding adoption decision and participation. Meaning, voter may like to assess appealing characteristics of the e-voting system before adoption or rejection decision (Yao & Murphy, 2007; Schaupp & Carter, 2005; Powell, Williams, Bock, Doellman, & Allen, 2012; Carter & Belanger, 2012; Carter & Campbell, 2011).

Theoretical proposition is unequivocal on the need to assess costs and benefits (in this case, voting system) as determinants of voting participation. This is considering a hypothetical proposition of rational choice theories that suggest instrumentality of e-voting system to increase voting participation as a function of the extent to which the system influences rational choice (decision) of the voter. "The adoption of Internet based applications opens up new, additional channels for participation in public affairs for citizens. Thus, the implementation of modern communications technologies . . . can encourage and strengthen civil society" (Kozakova, 2011, p 11). The strength of the proposition lies in the assumption that citizens participate in voting purely on rational basis and that votes are cast based on actual benefits (Norris, 2002).

A number of studies on e-voting adoption in various context are evident. However, glooming inadequacy of literature is acknowledged (de Jong, van Hoof, & Gosselt, 2008; Sæbø, Rose, & Flak, 2008) as "few studies have identified it's characteristics that make it an appealing option" (Carter & Belanger, 2012, p 27). Therefore, investigating impact of the e-voting adoption on voter turnout is an area where additional research is recommended (Ahmad et al., 2015a; Belanger, & Carter, 2010a; Carter & Belanger, 2012). The

proposition brings to relevance of research-based inquiry into the factors affecting e-voting system adoption as requisite for democratic decision to participate in elections.

1.3 Research Questions

Given the background to the problems of election in Nigeria and the subsequent proposed e-voting adoption as a measure to increase voters' participation in election, this study seeks to provide answer to a broad question, how to increase voter turnout using e-voting system in Nigeria. The study also provides answers to the following specific research questions:

i. What are the technological attributes, socio-psychological factors and political trust that influence voters' adoption of e-voting system as determinants of voting participation?

ii. How technological attributes, socio-psychological factors, and institutional trust influence voting participation?

iii. What are the factors with potential implications of imposing decrease in voter turnout in a drive to adopt e-voting system in Nigeria?

iv. How to solve problems of decreasing voter tunout in a drive to adopt e-voting system in Nigeria?

1.4 Research Objectives

This study investigates factors that influence citizens' adoption of e-voting system as determinants of voter turnout using both quantitative technique and in-depth exploration from the qualitative standpoint. The study has the following specific objectives:

i. To examine effect of diffusion of innovation's (DoI) constructs, computer self-efficacy and institutional trust variables on voter's intention to adoption e-voting.

ii. To assess mediating effect of relative advantage in the relationship between technological attributes, trust in the technology, computer self-efficacy and voter's intention to participate in elections using e-voting system.

iii. To explore factors with potential implications of imposing decrease in voter turnout in a drive to adopt e-voting system in Nigeria.

iv. To explore remedies to the problems of decrease in voter turnout in a drive to adopt e-voting system in Nigeria.

1.5 Conceptual Model

Given the highlight of e-voting adoption in Nigerian context, subsequent research questions, and the need for parsimonious model, this study integrates constructs from Roger's (1983) Diffusion of Innovation, Bandura's (1977) Self-efficacy Theory and McKnight's (2002) trust model to explain voter rational decision to participate in election using e-voting system in Nigerian context. Conceptualizing how technological characteristics and socio-psychological factors influence voter participation decision, the study proposes mediating role of perceived relative advantage (RA) in the relationships between perceived trialability (TRB), perceived observability (OBS), perceived ability to use (PATU), trust in the technology (TIT), computer self-efficacy (CSE) and intention to participate (ITP). The model also proposed the influence of trust in the electoral government officials (TEO) and trust in politically elected government officials (TPO) on

ITP. Moreover, drawing pictorial diagram to illustrate hypotheses and pattern of variables' relationship is an important aspect of PLS-SEM analysis (Hair, Hult, Ringle, & Sarstedt, 2014). Representation of the hypothesized relationship diagrammatically can help translates research ideas into the PLS-SEM equation for ease of analysis (Tabachnick & Fidell, 2014). Representation of conceptualized model of this research is presented in Figure 1.1 in order to guides for the translation of the research ideas into hypotheses formulation and testing.

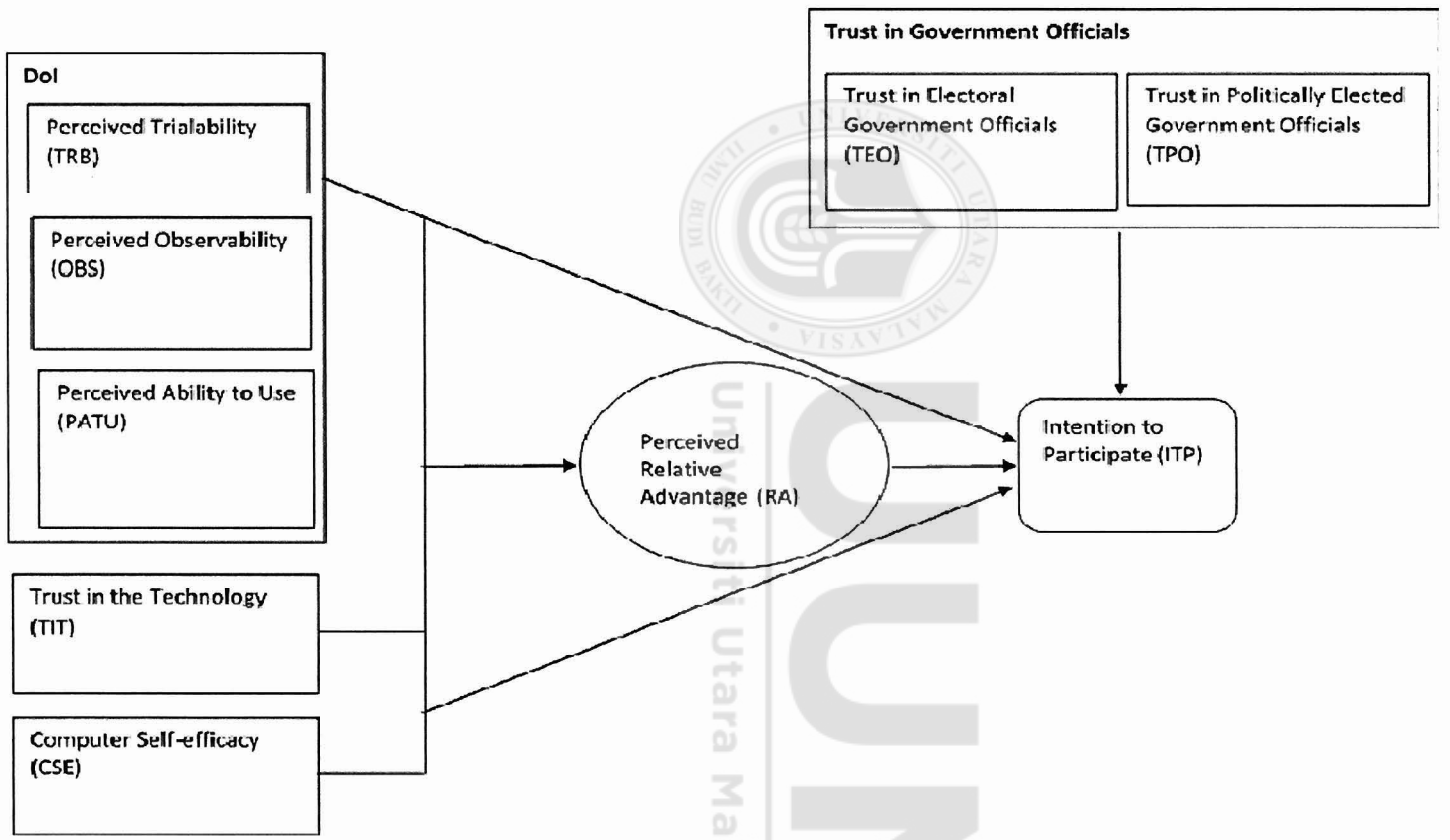

Figure 1.1. Conceptual model of e-voting adoption

1.6 Theoretical Framework

This study combines rational choice theory of voting participation, diffusion of innovation theory, computer self-efficacy and institutional trust frameworks to explain voting participation using e-voting system in Nigeria. Brief presentation of the theories and models in this section nonetheless, literature review section (Chapter three) contained deatailed accounts of the theories and models.

Rational behavior can be defined as chosen the appropriate means for achieving some given objectives. However, naturally it can be seen from choice between alternative means, economists have extended the concept of rational behavior far beyond "choices between alternative means to a given end to choices between alternative ends" (Harsanyi, 1969 p 515). Puzzle of individual motives to vote or not to vote assumes a central discourse of rational choice theory with voter turnout holding a special place (Aldrich, 1993).

Rational choice is about explaining how fundamental equation of political behavior such as attitudes, beliefs, values etc. determines voting behavior. The theory explains that individual preferences to vote or not to vote hinges on judgment of the outcome. However, rarely the definition of the outcome encompasses satisfaction or otherwise with the voting system. With "the adoption of Internet based applications opens up new, additional channels for participation in public affairs for citizens (Kozakova, 2011, p 11), ability of rational choice theory to explain voting participation using e-voting adoption is put to test.

Rational choice theory is therefore a rich theory capable of providing plausible explanation of rational decision of using e-voting system in election. The extents to which technological resources strengthen election participation depend on the fundamental structural

functionality of the technology to maximize electoral choices and electoral decisiveness. Rational choice theory is an important model in the analyses of political participation (Aldrich, 1993), despite counter argument by opposing views (e.g., Hindess, 1988; Eckstein, 1992).

Given the structure as well as the superstructure of social choice theory, scholar hinted that the theory has deep link with other sociopolitical theories such as cooperative and non-cooperative game theory and theories of distributive justice (Elster & Hylland, 1989; Grafstein, 2002). "Theories of rational behavior have a natural tendency to make a hypothetico-deductive form, and to explain a wide variety of empirical facts in terms of a small number of theoretical assumptions (such as assumptions about the actual objectives of peoples' behavior, about the resources and the information available to them, etc.)" (Harsanyi, 1969 p 515). However, rare empirical explanation of such incentives in the realm of technological and socio-psychological model is evident craving for additional studies.

Theoretically, plausible explanations by the proponents of DoI theory provided that five characteristic of innovation comprising of relative advantage, compatibility, complexity, trial ability, observability are very influential in determining behavioral intention to adopt new system (Agarwal & Prasad, 1998a; Carter & Bélanger, 2005; Hsu, Wang, & Chiu, 2008; Sang, Lee, & Lee, 2010). The constructs are widely discussed in general innovation adoption literature however, rarely investigated through empirical inquiries; and hence, the need for empirical testing of the constructs on behavioral intention is suggested (Hsu, Wang, & Chiu, 2008).

Although few studies on intention to adoption have been conducted using DoI constructs, use of relative advantage, compatibility and complexity is prevalent in most of such studies (Agarwal & Prasad, 1998; Carter, 2006; Carter & Belanger, 2005; Carter & Belanger, 2012; Carter & Campbell, 2011; Sang, Lee, & Lee, 2009; Schaupp & Carter, 2005; Shareef, Kumar, Kumar, & Dwivedi, 2011; Tornatzky, & Klein, 1982; Van Slyke, Belanger, & Comunale, 2004). Attendant paucity of literature for the trial ability and observability constructs is looming (Agarwal & Prasad, 1998b; Carter & Bélanger, 2005; Carter & Belanger, 2012). Therefore, Carter and Belanger (2012) suggested that future studies on e-voting adoption should examine the impact of trial ability and observability constructs.

Testing these variables is most fit to a scenario where innovation evolves newly into a community, and members are about to experience it the first time. In present Nigeria electoral circumstances, e-voting sytem is being proposed, but still anticipating and expectant and therefore, examining impact of trial ability and observability variables are worthwhile.

Literature indicated that the five major constructs (perceived attributes of the technology) explain from 49 to 87 percent of the variance in rate of adoption (Rogers, 1995). Insufficiency of the constructs to explain all the variance in the adoption decision, which lies in the inconsistent results of DoI constructs (Vishwanath & Goldhaber, 2003) suggests the relevance of other related but rarely explored variables in filling the vacuum. Diffusion scholars therefore recommend exploration of complementary variables in order to complement the variance (Rogers, 2003; Fichman & Kemerer, 1993; Chen, & Corkindale, 2008).

As evidently shown by IS research literature, various research studies adopt inter-theory permutation of constructs and variables in an effort to explain the remaining variance. For example, Amagoh, 2015; and Taherdoost and Masrom (2009) combined constructs from DoI, Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT); Holden and Karsh (2010) combined constructs from TAM, UTAUT, Theory of Planned Behavior (TPB) and Theory of Reason Action (TRA); constructs from DoI, TAM, TPB, TRA, computer self-efficacy were combined by Shareef, Kumar, Kumar and Dwivedi (2011) while Alomari, Woods and Sandhu (2012) combined constructs from DoI, TAM, TPB and trust.

Recently, IS researchers began to explore the relevance of political science and administration constructs to explain the variance (Abukhzam & Lee, 2010; Carter & Belanger, 2012; Chavoshi, Sim, & Hee, n.d.). Inter-theory research through combining constructs from different theoretical blocks resulted into modifications of DoI and other corroborative theories. Given the relevance of combined constructs from various theoretical blocks, this study intents to assess the mediating effect of relative advantage on the relationship between important but rarely used characteristics of technology in DoI (trialability and observability), trust in the technology and computer self-efficacy on the behavioral intention of voter to participate in election using e-voting system.

From the above conceptualized viewpoint, the study adopts rational choice theory as the underpinning theory to explain the relationships between the variables of interest using Roger's (1983) Diffusion of Innovation, Bandura's (1977) Self-efficacy Theory and McKnight (2002) trust model as complementary theories. Diffusion of innovation is a generic theory that explains how innovations diffused or spread in a social system (Hornik,

2004). The theory is important in providing explanation of the variables of interest to the study because it involves processes of awareness creation, attitude change, decision making, and implementation of the innovation and confirmation of, in this case, e-voting system.

However, the complications and risks attributable to e-voting system (Majekodunmi, 2013), most especially understanding the degree of voters' willingness to either accept or reject new system have also created an avenue for a new discourse in the public sector and the correspondence need to evaluate its acceptability through inquiry (Abu-Shanab, Knight, & Refai, 2010; Kersting & Baldersheim, 2004). Nevertheless, the area receives very little attention by information system and democracy researchers (Baiyewu, 2012).

1.6.1 Rational Choice Theory of Participaiton

Rationla choice theory is chosen because,

i. It is an important model in the analyses of political participation (Aldrich, 1993).

ii. It is an important framework that provides plausible explanation of the role of incentives in an individual decision to participate (Whiteley, 1995).

iii. It provides relevant variables that explain why some individuals are active participant while other are dormant/passive (Whiteley, 1995).

iv. Given the structure as well as the superstructure of social choice theory, the theory has deep link with other sociopolitical theories (Elster & Hylland, 1989; Grafstein, 2002).

1.6.2 Diffusion of Innovation Theory

DoI theory is chosen because of the following reasons:

i. DoI is a general process that exhibits patterns and regularities across a range of conditions, innovations, and cultures, not bound by the type of innovation studied, adopters, place, or culture (Rogers, Singhal, & Quinlan, 2005).
ii. DoI provides comprehensive explanations of how innovations diffused or spread in a social system (Hornik, 2004).
iii. Beyond awareness-knowledge, research on the diffusion of innovations focuses on attitude change, decision-making, and implementation of the innovation (Rogers, 2003).
iv. DoI theory is distinctive in studying 'perceived' or 'new' system by the individual receivers. In a situation where an individual experiences a high degree of uncertainty in seeking information about, and deciding to adopt and implement an innovation, in the sense of the newness of the message content (Setacks & Salwen, n.d.).

1.6.3 Self-efficacy Theory

Choice of self-efficacy theory is based on the following reasons:

i. General efficacy measure is a predictor of intentions to use for a wide range of technologically advanced products (Mathieson, 1991).

ii. Self-efficacy theory has multidimensional value embedded in processes of shaping behavioral intention through cognitive, motivational, and affective domains thereby enhances individual selection processes through shaping the behavior and determine ones feelings, thought and motivation drives (Bandura, 1994).

iii. Individual perception on how one proficiently handles technical intricacies of the system has profound impact at all stages of system adoption making self-efficacy theory a generic in virtually all system adoption theories and models (Chen, Chen, & Yen, 2011).

1.6.4 Trust Model

Trust model is chosen because,

1. Trust in government is significant predictors of intention to use e-government services (Alomari, Woods, & Sandhu, 2012).
ii. Given the continuum of threats to security breaches, trust in the e-voting system is a good determinant of intention to use the systems (Belanger & Carter, 2010).
iii. Fear of incorrect voting or misuse of voting machine out of anxiety correlates with the intention to use the system (Powell et al., 2012).
iv. Trust is multidisciplinary and multi-dimensional concept and that pragmatic differentiation of specific dimensions of trust has implication for shaping the behavior of client (McKnight, Choudhury, & Kacmar, 2002).

1.7 Significance of the Study

This study develops rational choice model of voting participation using e-voting system. Theoretically, the study extends the existing literature by testing combined influence of DoI constructs comprising of perceived trialability, perceived observability and perceived ability to use; trusting variables comprising of trust in the technology, trust in the electoral government officials and trust in the politically elected government officials and socio-psychological constructs – computer self-efficacy as essential factors that influence voting participation.

In addition, by introducing the mediating effect of relative advantage of e-voting in the relationship between DoI constructs, trust in the technology and computer self-efficacy on voter cognitive decision to participate, the study add to the existing knowledge about how and why technological attributes, trust in the technology and computer self-efficacy influence voter cognitive decision to participate. Furthermore, the study introduces two kinds of institutional trust namely, trust in bureaucratic electoral government officials and trust in politically elected government officials. In view of the newness of the model, the literature reviewed in this study would be useful in other relevant context of Information System (IS), rational choice voting participation, democracy and policy researches.

In addition to theoretical significance, the study is significant in practical sense. Inquiry into voter cognitive decision to participate in election using e-voting system is a key for future public policy and administrative decisions related to voting processes, and is of paramount importance to researchers of various fields of e-government, IS, and industrialists (Taherdoost & Masrom, 2009). Generally, this study is important to

democratic consolidation in that provides insight into the mechanisms for successful digitalization of electoral process. Findings of this study provide directions and guidelines for selection, policy direction and implementation of policies and programs that elicit citizens' adoption of e-voting and increase voter turnout.

The qualitative aspect of the study can further strengthen institutional capacities of the democratic agencies to understand factors with potential implications to impose decrease in votert turnout in a drive to adopt e-voting system; embark on effective strategic voting policy and enhance overall goal attainment of successful transition to e-voting system. Specifically, the qualitative inquiry would provide important tips for the INEC and other democratic institutions to invest on their strengths while improving upon their weaknesses.

In addition, it would provide support for policy direction. This study also provides useful hints for e-democracy researchers and practitioners as well as policy makers in Nigeria to formulate policies and viable programs to enhance voting participation. By providing tips for effective performance of electoral system, the study would facilitate diffusion of e-voting system as important step to facilitate voting participation that would propel the principles of inclusive governance, democratic consolidation and socio-economic development.

1.8 Scope of the Study

Access to people and sites; time and resources determine the feasibility of research study (Creswell, 2012; Uma Sekaran & Bougie, 2010). The width and breadth of this study is delineated within the ambit of accessibility of area, time and resources. Northeastern geopolitical zone of Nigeria is therefore the scope of the study.

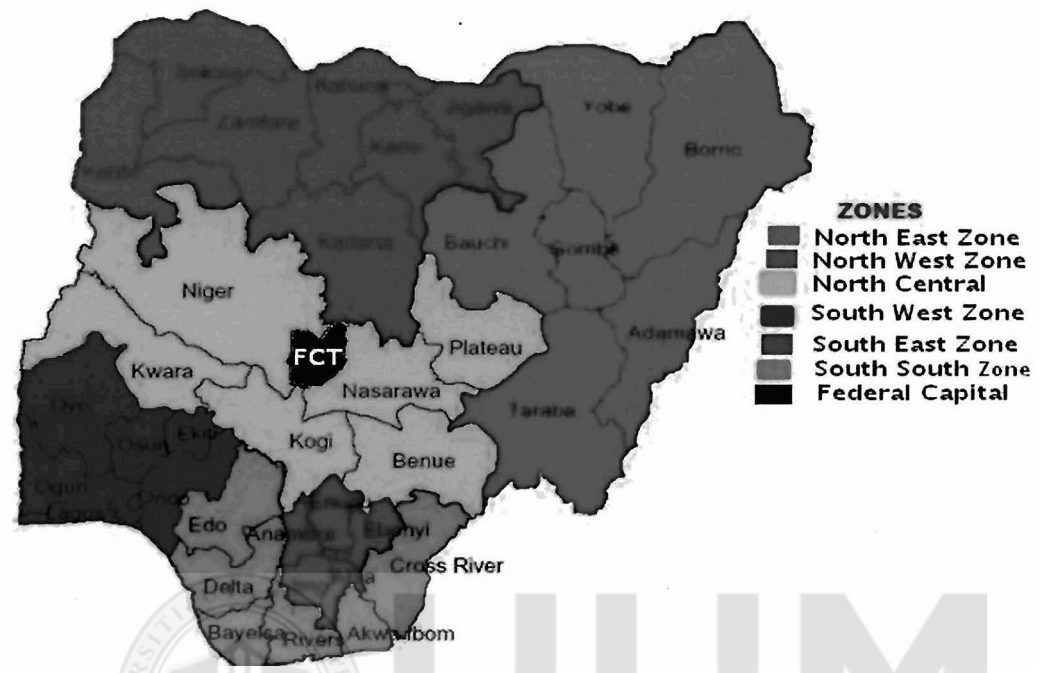

Figure 1.2. Map of Nigerian geo-political zones

Figure 1.2 above has depicted six geopolitical zones and their respective States. The scope of the study was selected using simple probability technigue. Selection of north east using simple probability technique nonetheless, the zone is least expected to adopt e-voting system considering its disadvantaged position educationally and economically. This is because, research studies established correlation between digital divides such as socioeconomic and educational background and rate of adoption (Carter, Shaupp, Hobbs, & Campbell, 2011; Belanger & Carter, 2010a; Hoffman, Novak & Scholsser, 2000; Ronaghan, 2002; Solop, 2001; Yao & Murphy, 2007). Porter and Donthu (2006) pointed out that low income and education negatively affect individual attitude to technology adoption in that the lower the education a person attains and the income earns, the less likely to adopt.

In addition, affordability is an issue of great concern among low-income citizens (Porter & Donthu, 2006). Conceivably, affordability and accessibility of technology favor those in upper socioeconomic strata than the lower (Hoffman, Novak & Schlosser, 2000). Supporting the idea, Uzoka and Ndzinge (2009) stressed that rate of adoption is affected by affordability power. In concordance, literature indicated that education increases likelihood of voting (Alverez & Hall, 2004; Hoffman, Novak, & Schlosser, 2000; Lyons & Alexander, 2000).

Considering the above argument, in terms of adult literacy, Northeast zone is the second least underprivileged compare to other geopolitical zones in the country as statistically shown in the Table 1.4 below.

Table 1.4

Adult Literacy Rate in English by Geo-political Zones

Geopolitical Zone	**Male**	**Female**	**Both Sexes**
North Central	65.1	47.3	56.4
North East	49.8	33.4	42.0
North West	39.7	23.2	31.7
South East	80.7	67.5	73.8
South-South	81.1	66.7	74.0
South West	75.5	62.6	69.1
National/Total	**65.1**	**50.6**	**57.9**

Source: National Bureau of Statistics (2010)

According to the Table 1.4 above, northeast has second lowest literacy rate of 42.0% among the six geopolitical zones, which is below national average of 57.9%. Moreover, the zone is the most socioeconomically ravaged in the countries as indicative in the Table 1.5.

Table 1.5

Wealth Quintiles according to Residence and Region, Nigeria 2008

Zone	Lowest	Second	Middle	Fourth	Highest	Total
North Central	20.6	23.2	25.3	17.1	13.8	100
North East	47.4	22.7	16.4	10.3	3.2	100
North West	31.9	30.9	17.2	12.5	7.6	100
South East	4.6	9.9	28.1	31.6	25.8	100
South-South	6.7	14.4	22.9	30.1	26.0	100
South West	4.2	11.6	15.3	24.3	44.6	100
Total	20.0	20.0	20.0	20.0	20.0	100

Sources: National Population Commission (2009)

From the Table 1.5 above, north east zone has the extreme values of highest rate of 47.4% for the lowest wealth quintile and the lowest rate of 3.2% for the highest wealth quintile, which is a clear manifestation of how economically ravage is the region. In addition, the zone is the most volatile to political violence. Evidence showed that the zone is the most widely hit by electoral related and politically motivated violence with second largest number of casualty where not fewer than 149 people were killed between the period of February to June 2011 politicking (National Association for Peaceful Elections in Nigeria [NAPEN], 2011). The scenarios are clear manifestation of evidence to exacerbate decrease in political participation.

Moreover, according to 2010 Nigerian poverty profile using relative poverty measure, 69% of the Nigerian population are living in poverty (National Bureau of Statistics [NBS], 2010), which is an indication that the socioeconomic characteristics of the northeast zone represent large segment of the country's population. In this regards, research inquiry into those from lower socioeconomic strata can provide insight about readiness of the

disadvantaged – vulnerable citizens that represent larger population of the country in order to set a base that reflect mass majority as against the illusion of few haves (Hoffman, Novak & Schlosser, 2000).

However, it is noteworthy that Adamawa, Borno and Yobe States were excluded from this study, because of prevalent insecurity in the States as shown in Figure 1.3.

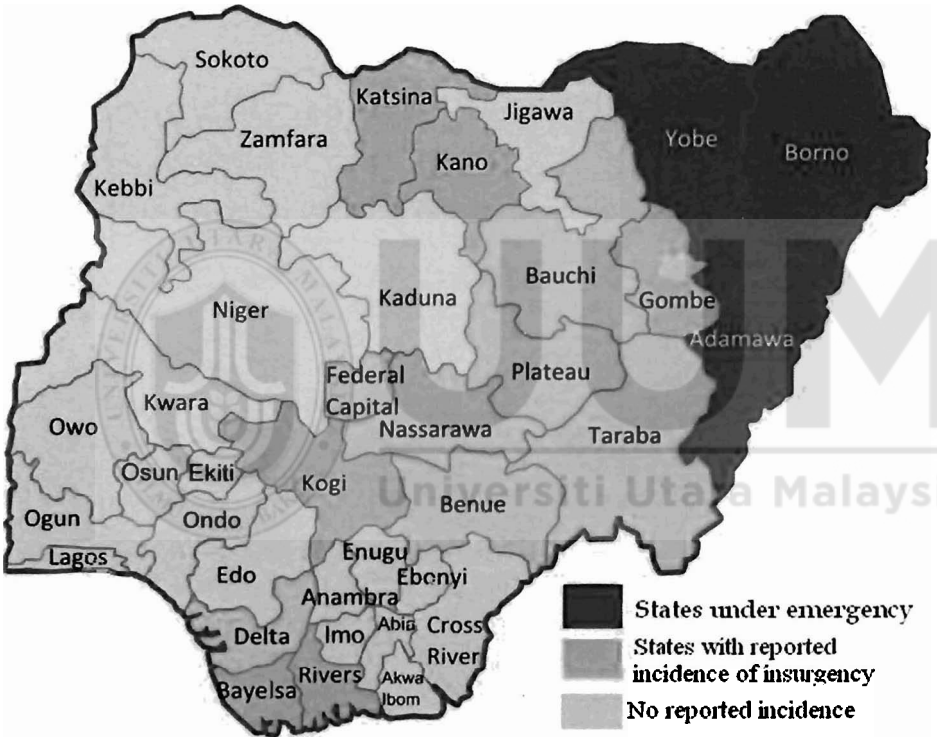

Figure 1.3. Map of Nigeria showing extent of insurgence by State
Sources: Ajayi (2014)

Figure 1.3 above displayed intensity of the activities of insurgence in Nigeria, which led to imposition of emergency rule in three States of the Northeast as at May 14 2013 ("Breaking news: Jonathan declares state of emergency in Borno, Yobe and Adamawa States," 2013).

By means of mixed method of research, the study utilized survey (questionnaire) and interviews instruments of data collection through which primary data were collected from respondents in three States of northeastern part of Nigeria comprising Bauchi, Gombe and Taraba States. The study sampled opinions of two likely opposing groups alone educational qualification and income. The data was collected within period of four months at the springtime of 2014. In addition, secondary data sources have been utilized throughout the study.

1.9 Definition of Key Terms

Voting Behavior

Voting behavior refers to intrinsic and extrinsic drives that influence electorates to vote in a particular pattern in an election. It also entails how the electorates vote and what determines the way they vote (Mahmud, 2015).

Rational Action

Rationality is defined as the maximization of conditional expected utility . . . [that] ultimately views human beings as full-scale objects of scientific analysis. Rational action is a methodological individualism that implies individual voter cognitive decision to vote by calculating costs and benefits of the voting outcome (Grafstein, 2002).

Political Participation

Political participation is a psychological trait connected to political behavior of an individual in a society. It entails citizen's political will to involve voluntarily in the legitimate political activities directly or indirectly such as election of political leaders, referenda debate, participation in civic organization, community activities and other civic engagements in order to influence policy making concerning a common goal of the society (Awopeju, 2012).

Voters' Turnout

Voter turnout is defined as the ratio of the number of votes cast in a given election out of the total number of registered voters. It also refers to actual number of voters who participated in an election from the total number of registered voters (Geys, 2006; Mahmud, 2015).

Institutional Trust

Institutional trust refers to citizens' reliance and confidence repose in tha ability of public institutions in the discharge their collective responsisibilities to the extent that electoral outcome is determined by the institutionalized structures and processes and non-partisan (Agbaje & Adejumobi, 2006).

1.10 Organization of Chapters

This study comprised of seven chapters. Chapter ones dealt with the rationale of the study comprising of introduction, problem statement, research questions, research objectives,

conceptual model, theoretical framework, significance of the study, scope of the study, definition of key terms and organization of chapters. Chapter two consists of background of the study that provided an overview of election; real and potentials challenges of e-voting in Nigerian. Chapter three presented literature review in the light of the underpinning theories and constructs. Also presented in chapter three, hypotheses development.

Chapter four discussed research methodology based on convergent parallel designs. The chapter, which is divided into quantitative and qualitative research designs also discussed about population, sample and sampling technique; instrumentation, questionnaire administration and pilot study on the part of the quantitative research design. On the qualitative aspect, the chapter discussed face-to-face interviews, selection of participants, reliability and validity; potential ethical issues and pilot study. Chapter five presented quantitative data analysis and hypotheses testing whereas chapter six composed of qualitative data analysis. Chapter seven highlighted on the summary of the findings; discussed both quantitative and qualitative findings. Finally, the chapter discussed implications of the research to theory and practice; suggested direction for future study and conclusion.

1.11 Summary

This chapter provides an overview of rationale for the study. The chapter presents background that premised adoption of e-voting system in Nigeria. Concise statements of problems were presented, which ushered in asking specific questions the study intends to

address, and subsequently to specific objectives aimed to achieve. Both practical and theoretical contributions were highlighted. The scope in terms of geography, time and unit of analysis are delineated while important key terms were defined. At the conclusive part is outline of the chapters. This brings to the fore, the need to take account of background information on Nigeria and her electoral antecedents.

CHAPTER TWO

BACKGROUND OF ELECTIONS IN NIGERIA

2.1 Introduction

This chapter focused on providing account of why and how the issue of e-voting occupies a central discourse in Nigerian electoral system. The chapter highlighted an overview of Nigeria, historical antecedents of its Electoral Management Bodies, challenges of manual voting system as well as background information on the e-government initiatives. The chapter also scaled down to the extent of the use of technology in Nigerian elections and the associated problems.

2.2 An Overview of Nigeria

Nigeria is a country geographically located in the West African sub-region, lying between latitudes 4°16' and 13°53' north and longitudes 2°40' and 14°41' east. The country bordered with Niger in the north, Chad in the northeast, Cameroon in the east, and Benin in the west. It also bordered by approximately 850 km of the Atlantic Ocean by the south. In terms of land mass, Nigeria is the fourteenth largest country in Africa with a total land area of 923,768 sq. km.

Figure 2.1. Map of Nigeria within Africa

Figure 2.1 depicted geographical map of Nigeria within Africa. Nigeria has an estimated population size of 174,507,539; making it the seventh most populated country in the world as at July 2013 est. (CIA, 2013). Ethnically and linguistically diverse with over 250 ethnic groups and over four hundred languages and dialects, Hausa/Fulani, Yoruba and Igbo are three major ethnic groups predominant in the north, south west and south eastern part of the country respectively. The major ethnic groups have profound influence in shaping the country's socio-economic and political antecedents. The country has multi religious practice with Islam constituting 50%, Christianity 40%, and to a lesser extent, African Traditional Religion 10% as the main religious groups (Country Profile: Nigeria, 2008; Nigeria Demographic and Health Survey [NDHS], 2008; CIA, 2013).

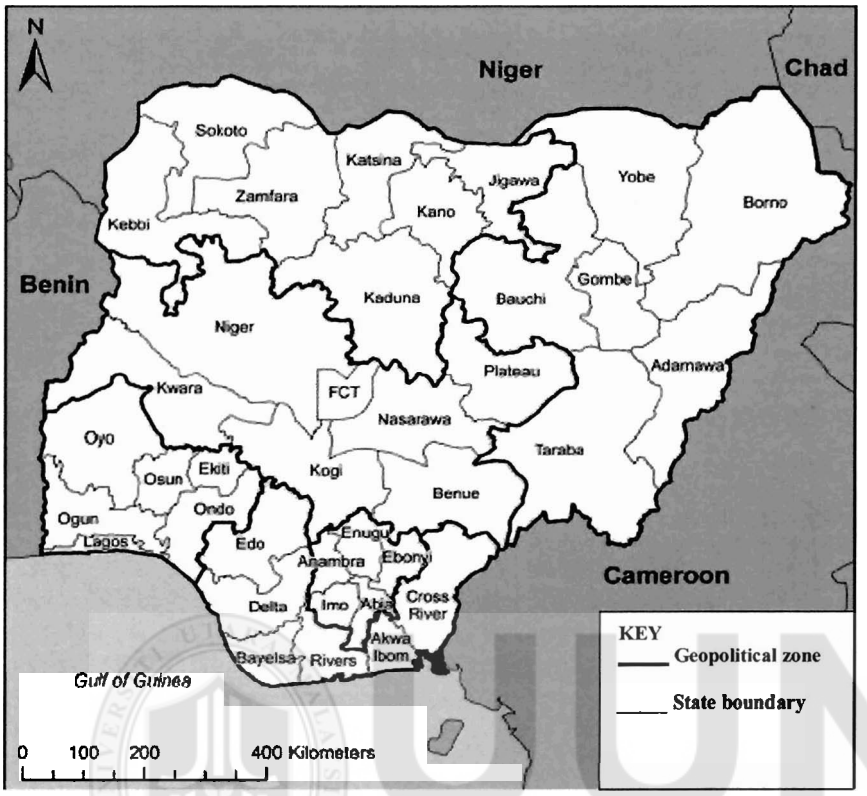

Figure 2.2. Map of Nigeria showing geo-political zones and State boundary

Sources: Nigeria Demographic and Health Survey (2008)

Figure 2.2 above displayed six geopolitical zones and thirty-six States of Nigeria. Administratively, the country is a federation of 36 States and a Federal Capital Territory (FCT). The States are broadly classified into six geopolitical zones namely: North Central, North East, North West, South East, South-South and South West zones. There are 774 constitutionally recognized Local Government areas in all the 36 States, and six area councils in the FCT.

2.2.1 Economy

Nigeria has an abundance of arable land constituting 33% of the total land mass, 3% permanent crops, and 64% others going by 2005 land use. Before the discovery of oil, Nigeria depended almost entirely on agricultural production for food and agro-industrial raw materials for foreign exchange earnings. Other natural resources found in different locations in the country consist of tin, iron ore, coal, limestone, niobium, lead, and zinc. With the discovery of oil in the early 1970s and few years later, the dominant role of agriculture as the country's economic strength gave way to petroleum exports (Country Profile: Nigeria, 2008).

The boom in the oil sector followed proven reserves of 36.2 billion barrels, the tenth largest reserves in the world; while proven natural gas reserves are estimated at 182 trillion cubic feet, the seventh largest reserves in the world and the largest in Africa according to estimates for oil and natural gas reserves of January, 2007 (Country Profile: Nigeria, 2008). The oil and gas reserve has since clenched top on economic ladder of Nigeria making up to 99% of export revenues, 78% of government revenues, and 38.8% of the GDP as at 2006. Since 1980, oil production has accounted for more than two-thirds of the GDP and more than 80 percent of the total government revenues (Federal Republic of Nigeria [FRN], 2008).

2.2.2 Political Landscape

The country known as Nigeria came into existence as a nation-state in 1914 when the hitherto distinct Northern and Southern protectorates were amalgamated by colonial

administration. In 1960, the country attained political independence, and subsequently became a republic on October 1 1963 with entirely different administrative structures. On October 1 2015, Nigeria marked fifty-five years of her political independence out of which the country had about thirty years of military rule.

Nigeria is strategic in African and international affairs giving her population and resources. Years of despotic and debilitating military rule and unprecedented corrupt practices by the civilian administrations, notwithstanding the resources endowment, rendered the country vulnerable to arbitrary and often poor governance. Consequently, lack of transparency and accountability, lawlessness, economic instability and human rights violations assume routine in public and private sectors in the country.

The current democratic dispensation began with the swearing in of Chief Olusegun Obasanjo as the elected President in May 1999 and was re-elected in 2003 elections. Alhaji Umaru Musa Yar'Adua succeeded Obasanjo as elected president at the April 2007. Vice-President, Goodluck Jonathan took over after Yar'Adua passed away in 2010. Jonathan was elected in April 2011. Though local and international observers have adjudged the election as free and fair nonetheless, post-election violence of the high magnitude ensued, which resulted into loss of lives and destructions of property (INEC Strategic Plan, 2012). After 16 years of the ruling party, Muhammadu Buhari of the hiterthor opposition party was elected president at the recently concluded April 2015 elections.

2.3 Historical Overview of Electoral Commissions in Nigeria

From pre-independence election in 1959 to date, there have been not fewer than six Electoral Management Bodies constituted to discharge electoral administration in Nigeria. These bodies conducted 11 non-successive general elections with some of them only at Local Governments, States and National Assembly. The recess periods were ruled by military regimes. Frequent change of the Commissions signifies mere expression of names because the structures, powers, hierarchy and philosophy remain same. Traditional paper ballot methods of voting using Secret Ballot and Open Ballot Systems of elections were used in all the twelve elections conducted in Nigeria.

The first Electoral Body set up was the Electoral Commission of Nigeria (ECN) that conducted 1959 general elections. Another Federal Electoral Commission was set up in 1964 to conduct the December 1964 federal elections and the 1965 Western regional elections. There was no Electoral Body in the country from 1966 to 1979 due to suspension of all political activities including the Constitution, following a military coup of 15 January 1966.

On return to civil rule in 1979, the Federal Electoral Commission (FEDECO) was established, which organized the 1979 and 1983 general elections. National Electoral Commission (NEC) was established in 1987. The Commission organized elections in 1992 through to June 12, 1993 elections In December 1995, National Electoral Commission of Nigeria (NECON) was established while the Independent National Electoral Commission (INEC) was established by the 1999 Constitution (INEC Strategic Plan, 2012).

Table 2.1

Election Management Bodies in Nigeria

S/No	Name of Election Management Body (EMB)	Period of Existence
1.	Electoral Commission of Nigeria (ECN)	1959-1964
2.	Federal Electoral Commission (FEC)	1964-1966
3.	Federal Electoral Commission (FEDECO)	1979-1983
4.	National Electoral Commission (NEC)	1987-1993
5.	National Electoral Commission of Nigeria (NECON)	1995-1998
6.	Independent National Electoral Commission (INEC)	1998-date

Source: INEC Strategic Plan (2012)

2.4 An Overview of Independent National Electoral Commission

Section 153 (1) (f) as elaborated by Part 1 of the Third Schedule, Section F of the 1999 Constitution established the INEC as an Election Management Body (EMB) to among other things organize free fair and credible elections into the various political offices in Nigeria. INEC has a broad mandate. Section 15, Part 1 of the Third Schedule of the 1999 Constitution (As Amended), and Section 2 of the Electoral Act 2010 (As Amended) have categorically spelt out specific functions of INEC. The functions include among others organizing and supervising all elections to the offices of the President and Vice-president; the Governors and Deputy-governors of States; and to the membership of the Senate, the House of Representatives and the House of Assembly of each State of the Federation. In addition, the Commission registers political parties; monitor the organization and operation of the political parties, including their finances; arrange for the annual examination and auditing of the funds and accounts of political parties, and publish a report on such

examination and audit for public information. The Commission conducted the 1999, 2003, 2007, 2011 and 2015 elections.

2.4.1 Structure and Authority

Section 14 (1), Part I of the Third Schedule of the 1999 Constitution (As Amended), and Sections 6, 7 and 8 of the 2010 Electoral Act (As Amended) provide the framework for the structure of INEC. A Chief Electoral Commissioner, also known as Chairman and twelve other members, known as National Electoral Commissioners, heads the Commission. The chairperson together with the 12 National Electoral Commissioners constitutes the policy-making organ of the Commission.

The Constitution also provides for Resident Electoral Commissioners (RECs) for each State of the Federation and the FCT who are answerable to the Commission. Section 8(1) of the Electoral Act provides for the Secretary to the Commission who is the Head of the Commission's Secretariat and is responsible for its administration as well as for the control of all other employees of the Commission with the approval of the Commission.

At the National Headquarters, the Commission functions through Directorates and Departments (Omeiza, 2012). For example, an important institution within INE called The Electoral Institute (TEI) was established in June 2005 to among other functions, facilitate capacity building and professionalism among the electoral officials, engage in vigorous voter education activities, and conduct electoral research and documentation (Igbani 2006, p 56). Generally, the values set out to guide the conduct of INEC include autonomy, transparency integrity, credibility impartiality dedication, equity, excellence and teamwork.

2.4.2 Methods of Voting in Nigeria

Election Day is usually phased into three main activities each allotted with specified time. Thus, accreditation, voting, and counting/announcing results. Voter accreditation entails verification and authentication of potential voters according to their eligibility and registered voting centers. The poll officials verified the potential voter by confirming his/her name, gender, age, photograph etc. afterward, issued with accreditation clearance form. Only accredited voters would be issued with ballot paper and have his/her fingernail marked with indelible ink signifying cleared to vote.

Enshrined in the Electoral Act 2010 as amended, Section 52(1) (a) stated, "Voting at an election under this Act shall be by open secret ballot". Open Secret Ballot System (OSBS) method of voting is used in seven out of eight past elections that was, in 1979, 1983, 1999, 2003, 2007, 2011 and 2015. The method required voting exercise in a secret voting compartment to ensure secrecy and confidentiality without compromising transparence-voting process. Accordingly, under the supervision of the poll officials, security and party agents, the accredited voter move into the secret apartment and makes confidential thumb impression in favor of a party or candidate of interest on the official ballot paper and drop same into the ballot box positioned in an open place.

In 1993 elections, Modified Open Ballot System was adopted, in which voters filed behind the party symbol or photograph of the candidate of interest. Voters were physically counted at the close of polls and the results declared to officials, security and party agents. Votes counting, collation and announcing results is done first at every area collation center/booth center in the presence of the voters, poll officials, and party and security agents. Depending

on the kind of the election, the results are compiled and collated from different collation points at the level of local government, state and up to presidential centers. The results would then be sent to the headquarters for approval and publishing (Maiye & McGrath, 2008).

2.4.3 Challenges of Elections in Nigeria

Owing to apparent flawed electoral process, some of the major inherent characteristics of developing democracy include instability, acrimony, rancor and successive crisis. Other equally fundamental problems underlying successful conduct of election in Nigeria include ethno religious intolerance, lack of independence of the electoral Commission, parochial foundations of political parties, monetization of politics amidst mass poverty, widespread illiteracy among the voting population, unemployment and violence (Alabi, 2009). Heterogeneous nature of Nigerian societies is often exploited as centrifugal forces for reinforcing ethno-religious cleavages through primordial politics than a force for cohesion and harmony.

Scaling down to challenges of elections, it has been a consensus among researchers on Nigerian democracy that election in Nigeria lacked the minimum standards of free, fair and credible democratic elections with the biggest challenges of lack of transparency at every stage of the electoral process (Alabi, 2009). Given the vulnerability of the voting system, Abdulhamid et al. (2013) postulated that weakness associated with manual method of voting has been the basis of electoral flaws and fraud in Nigerian voting antecedents that often leads to disagreement on election results and eventual post-election violence. The

flawed election system that is vulnerable to the use of coercive forces and violence to legitimize pseudo citizen's participation has implications of preventing citizens from taking part in decisions pertain to distribution of economic resources (Majekodunmi, 2013).

In this regards, available literature indicated that specific challenges of Nigerian election are categorized into pre-election day challenges, Election Day challenges and post-election challenges. Some of the leading challenges of pre-election day include compilation of fictitious names on voter registers, illegal compilation of separate voter lists, and abuse of the voter registration exercise, illegal printing of voter cards, forms used for collation and declaration of election results; and illegal possession of ballots boxes (Alabi, 2009).

Challenges associated with election day are numerous. Some of the challenges comprise of deliberate refusal to supply electoral materials to opposition strongholds; delay in opening polling units located in opposition strongholds, inducement of voters with food and money, and threatening them with coercion and violence. Harassment of candidates, agents and voters; ballot box snatching; stuffing of ballot boxes with ballots papers, illegal thumb printing of ballot papers, change of lists of electoral officials, falsification of election results are part of the challenges. Moreover, other challenges include multiple voting, under-aged voting, announcement of results in places where elections did not held, unauthorized announcement of election results, and inflation, rigging by corrupt partisan agents and officials (Alabi, 2009; Orji & Uzodi, 2012).

Post-election challenges includes refusal to count ballots from opposition strongholds, changing of elections results while conveying it from voting centers to collation centers,

declaration of false results, annulment of results based on flimsy excusses, and manipulation of the election petition process (Alabi, 2009).

In the light of the above, ICT adoption into the electoral processes such as e-voting has been advocated to serve as panacea to the problems of multiple voting, and other forms of rigging; as well as improve openness and transparency of the voting process (Isong & Ndwamato, 2013; Majekodunmi, 2013). However, ICT adoption researchers in Nigeria have been consistently highlighting the major challenges of e-government initiative to include low technological proficiency among the general populace, poverty, inadequate legal framework, inadequate pre-requisite infrastructure, dwindling electricity supply and corruption (Ahmad et al., 2015a; Apulu, Latham, & Moreton, 2011; Majekodunmi, 2013; Omeire & Omeire, 2014; Posu, 2006).

Given the effect of the inherent problems, it is anticipated that e-voting adoption might lead to the risk of exclusion of the vast majority of the citizens. If not properly contained, e-voting is likely to consolidate and strengthen the role of the elites in the political processes, while further marginalizing the poor and the illiterates (Majekodunmi, 2013).

2.5 Overview of e-Government Implementation in Nigeria

e-Government implementation in Nigeria reflected in evolution of ICT can be examined in the light of various policies and strategies the government has been initiating and adopting to enhance ICT development in various sector of the economy towards boosting national development. Considering the population size and resources endowment, the rate of ICT development in Nigeria prior to 1999 is far below expectations. Here, telephone and

internet usage would make a good reference, as there were less than 400,000 fixed telephone line and less than 200,000 regular internet users.

The looming problem led to aggressive revolution in various ICT related policies, Commissions, services and Acts in Nigeria. For example, National Telecommunication Policy (NTP) was adopted in 2000 to promote development of ICT industry and subsequently Nigerian Communication Act (NCA) was enacted in 2003 to provide legal back up to the NTP. Similarly, National Information Technology Policy was approved in 2000, which was meant to guide IT industry in the country.

The policy was accompanied by the enactment of National Information Technology Development Agency Act 2007 that laid the legal platform for the establishment of National Information Technology Development Agency (NITDA) (National ICT Policy, 2012). NITDA was established to among others implement ICT related policies, and subsequently planted some formidable internal structures to facilitate its implementation capacities. Projects such as Human Capacity Building, Public Service Network (PSNet), and Mobile Internet Unit were mounted (Goshit, 2004).

Consequent to the policies and regulatory development along other government and private initiatives, the rate at which ICT sector is developing have tremendously improved. For example, a striding transformation of fixed telephone lines from approximately 400,000 in pre 1999 to over 90.5 million mobile telephone lines by the first quarter of 2011 is so significant that made the country's telecommunication market the fastest growing in Africa. In addition, National ICT Policy (2012) reported significant transformation in various ICT development in Nigeria using some interesting indicators.

Table 2.2

ICT Development Indicators in Nigeria

Measurement	**Indicators**
Mobile penetration (per 100 ppl)	55.76*
Fixed penetration (per 100 ppl)	0.48*
Internet penetration (per 100 ppl)	23.48**
Internet users (000)	43 270**
Broadband penetration	**6.1%****
PC penetration No of PC per 100)	**4.7****
Computer assembly in Nigeria	**<500**,000*
Number of registered ICT companies	**350***
Broadcasting stations nationwide	308*

Sources: National ICT Policy (2012)
Note: ** indicates 2010; * indicates 2011

To buttress the viewpoint that ICT in Nigeria has been transforming drastically (National ICT Policy (2012) can be examined by contrasting changes in the benchmarking indicators of UN (2003, 2004, 2008, & 2012) as in the Table 2.3.

Table 2.3

Nigeria ICT Benchmarking Indicators

YEA	Mobile/cellular subscription (per 1000 pers)	Technological i frastructure index	PCs (per 1000 pers)	Internet (p r 1000 se s)	I ternet Index	Persons online index/ Online service index value	Fixed internet subscription (p r 100 inhabs)	Tel line (per 1000 pers)	I li e i dex	Fixed broadband subs (per 100 inhabs)	e-participation index
2003	13.6	.013	6.8	1.67	.003	.001	-	5.8	.006	-	
2004	13.4	-	7.1	3.5	.0		-	5.8	.0		
2008	24.05	.049	.91 (per 100 inhabs)	5.95 (per 100 users)	.067	-	-	1.26 (per 100 users)	.013	-	.068
2012	55.10 (per 100 inhabs)	.127	28.43 (per 100 inhabs)	N/A	N/A	.22	0.12	1.26 (per 100 users)	N/A	0.06	.184

Sources: UN (2003, 2004, 2008, & 2012)

Note: Only indicators of interest to the researcher are considered.

Table 2.3 is a summative of UN e-government survey of 2003, 2004, 2008 and 2012 that showed at a glance, the striding rate at which e-government triumphed in Nigeria. For example, mobile subscriptions have risen from 1.36 (per 100 persons) in 2003 to as much as 55.10 (per 100 persons) in 2012. In similar analogy, the rate at which individual afford personal computer such as laptop have tremendous increased from 6.8 per 1000 (i.e. 0.68 per 100 persons) in 2003 to 28.43 per 100 persons in 2012. In addition, a column of internet users has significant increase from 1.666 per 1000 (i.e. 0.0166 per 100 person) in 2003 to 5.95 per 100 users in 2008.

e-Transformation has laid a basis of modest ICT deployment in various functions of public agencies and private sector organizations such as financial, oil and gas sectors. The three tiers of government comprising executive, legislature and judiciary including their various departments such as INEC have also identified with deployment of ICT initiative into their various functions thereby promoting e-government practices. ICT does not confine within the provision of infrastructure, and other IT gadget, but include and not limited to initiatives that facilitate learning and exchange of knowledge and ideas in different local milieus.

2.5.1 ICT in the Electoral Administration

Internal administration of INEC involved lines of communication at horizontal, vertical and diagonal dimensions. The need for quality communication in various hierarchies of authority and between the Headquarters, State and Local Government Areas as well as between various departments is stressed. ICT is indispensable catalyst capable of turning around the administrative performance of INEC to reflect the principles of good governance. Effective use of electronic media such as, internet, fax, e-mail, social media, blog, fixed telephone etc. can enhance transparency, accountability, participation, rule of law and inclusiveness in the administration of INEC.

Further, the entire segment of election processes comprising of voters' registration, verification, vote casting, and collation and transmission of results require the use of robust technology that can ensure speedy, accurate, secured, reliable and transparent voting. ICT is therefore an effective medium that will facilitate strategic communication in the INEC offices and for the entire electoral process (INEC Strategic Plan, 2012).

ICT is a catalyst that can be crystalized into strategies for building socio-economic fortress to ensure even and sustainable national development. ICT is conceptualized as any electronic technology used to facilitate communication, supports electronic display, information gathering and promotes easy capturing, processing and transmitting information. (Apulu & Latham, 2009; Beckinsale & Ram, 2006). Realization of ICT strength can be translated into development of synergies, pool resources and strengthen capacities.

2.5.2 Voters' Registration in Nigeria

The integrity of the elections to some significant extent depends on the quality of the voter's register. In Nigeria, the fundamental challenges of electoral process lie in voters' registration and credible voting system. Voters' registration has a tale of inconsistencies, irregularities and oddities of different magnitude. Until 2007 voters' registration, all the previous voters' registration exercises conducted used Manual Data Entry method. The attendant effect was multiple of problems that characterized the exercise thereby jeopardizing the authenticity and credibility of the register. These problems include, multiple voter registrations, registration by proxy, under age registration, inadequate supply of registration materials, tradeoff of registration materials, and violence in the registration centers (Mohammed & Bashir, 2010).

The resultant effect of the above problems was the production of voters register that could not enjoy as much credibility as expected. The need to have complete, accurate and up-to-

date voters' registration as well as credible and transparent voting system laid the foundation for the search of more robust technology to improve the conduct of elections.

Use of Optical Mark Reader (OMR) forms in 2003 was the first attempt to introduce electronic voters' registration in Nigeria to replace paper-based system. The objective of the new technology was to reduce electoral fraud, produce comprehensive database of eligible voters and eliminate the need for re-registration at subsequent elections. Registration using OMR entails that citizen thumbprint on the provided forms and shades one's personal details based on the corresponding alphabets. Forms collated within each ward would then be scanned onto the system and the OMR software transcribed the shaded portions into text for storage in the database. Biometric verification would then be run within each ward to identify and disqualify multiple registrants (Maiye & McGrath, 2008). At the end of the 2003 e-voters' registration exercise, there were increased of 4.74% against the previous exercise of 1999 that employed the use of paper-based (Ayo et al., 2008).

2.5.3 e-Voter Registration during 2007 Elections

Information and Communication Technology is a new dawn in the conduct of free, fair and credible elections worldwide. The use of ICT in INEC internal administration and for electoral process has opens a new page in the history of Nigerian elections, particularly from 2007 elections. Consequent to the shortcomings encountered during 2003 voters' registration and based on the recommendations by the International Foundation for Election Systems (IFES), INEC has introduced computerized Direct Data Capture Machine (DDCM) for 2007 voters registration exercise. The sole objective of DDCM is to produce

comprehensive permanent voters' registration card/database, prevent multiple voting and prepare ground for full-fledged electronic voting (INEC, 2007).

The DDCM operates in a way that details, including thumbprints and photos were entered directly to a digital form, providing an opportunity to confirm accuracy of the data before the voters' cards were printed out for on the spot collection. Comprehensive list of registered voters would be displayed at each voting word at the end of the registration period, making automated verification of voters on election days feasible. This effort was applauded by the report of Registration and Election Review Committee (RERC, 2012), which highlighted that the use of e-voter registration and e-transmission of results during 2007 general elections has recorded some level ground of success, as about 61.5 million voters were successfully registered electronically (Kwaja, 2008). The number of registered voter in 2007 had a marginal increase of 1.22% over that of 2003 (Ayo et al., 2008).

2.5.4 Problems of e-Voter Registration during 2007 Elections

The problems of elections in Nigeria lie at the heart of the electoral management bodies (Iyayi, 2007). Due to lack of technical capacity and administrative constraints including material and logistics ill preparations, the outcome of the 2007 e-voter registration, and subsequently the elections failed to meet national and international standards (Adetula, 2008). The failure is attributed to various factors, one of which was malfunction of the electronic machines at the stages of the voters' registration and voters' verification that eventually affect the process (RERC, 2012).

Inadequate supplies of the DDCM to cover the voting units across the country hamper the effective conduct of the 2007 e-voters' registration exercise. It was estimated that only about 1,500 DDCM were available at the commencement of the exercise as against the estimated 33,000 required to cover the 120,000 registration centers. Consequent to inadequate DDCM to cover the registration centers, millions of Nigerians were disenfranchised, which is an overturn of political apathy. At the heart of this short supply, some electoral officials were accused of mortgaging sizeable number of the DDCM to some politicians to perpetrate partisan motives, including registration of unqualified persons. The above constraining factors crave for more improvement (Kwaja, 2008).

2.5.5 e-Voter Registration during 2011 General Elections

The history of Nigeria election is characterized by irregularities of various degree and magnitude as fallout of inadequacy of the traditional paper ballot systems as well as laxity on the part of the government officials. However, improved in the use of DDCM in the recently concluded 2011 general elections resulted in significant improvement in the conduct of the election to the eventual commendation by the local and international observers who described the election as relatively the most free and fair in the history of the country (LeVan & Ukata, 2012; RERC, 2012; Salam, 2012). The remarkable success in contrast to the previous elections conducted since 1999 is not unconnected to improvement built upon the lapses identified during 2007 elections and change in the leadership of the INEC.

Figuring some of the success recorded for instance, the Commission supplied 232,000 direct data capture machines, including laptops, cameras, and printers to cover 119,000 polling units in the country. The results of the exercise that last for 21 days was registration of 73.5 million voters as against the estimated 67 million voters (Jega & Hillier, 2012). In addition, using Automated Fingerprint Identification System (AFIS) software led to identification of about 870,000 duplications (INEC, 2011). The success recorded candle a light of hope concerning use of voting technologies in Nigerian electoral system in that various quarters begun serious agitation for full-fledged implementation of e-voting in the forthcoming 2015 general election (House Committee on Diaspora Affairs Website, 2012; INEC Website, n.d.a; Mashood, 2012; Salam, 2012).

Furthermore, in the light of the impressive performance of 2011 e-voters' registration coupled with pockets of agitations for implementation of e-voting in the forthcoming 2015 election, RERC (2012) in its catalog of recommendations appealed to policy makers and other relevant authorities to review the policies and regulatory guidelines governing elections in Nigeria to provide effective legal framework for e-voting. As there had been so many flaws and irregularities associated to the voting system in particular and the election in general (Jega, 2012), more room for improvement abounds 2011 e-voters' registration and e-transmission of results given the heap of lapses pervaded the exercise and the previous ones. In this regard, RERC (2012) suggested for the review of the voting mechanism and subjects it to trial basis before adopting it in the subsequent elections. The review according to the report should include provision for print ballot paper as back up to support electronic machine in the event of malfunction and during election litigation. Specifically the report suggest for incremental implementation of electronic voting system

using mock, pilot, bylaws and re-run elections in order to ascertain effectiveness of the system and overcome short comings ahead of the general elections.

2.6 Institutional Challenges to e-Voting Adoption in Nigeria

Irregularities trailing Nigeria's political system can be linked to weak institutional capacity of the INEC as problems such as inadequate technical and logistic preparation, lack of initiative and operational capacity are inherent weaknesses of the Commission. More so, limited technical competency and corrupt tendencies are obvious manifestation among various calibers of its staff (REC, 2012). Generally, flawed nature of Nigerian political process is a breeding ground for political corruption to permeate into the process and routine of public institutions with severe non-performance effect.

The consequences of this phenomenon are fatal to the sacred norms of democracy to an extent that some writers contemplate whether Nigerian government exists mainly for corruption to thrive (Alabi, 2009) while others referred it to as an "institutionalization of corruption" (Adetula, 2008). The implication these problems impose on political life of individual citizens resulted into serious political apathy, a scenario that creates citizens' cynicism against new government policy, e-voting system adoption inclusive.

Moreover, lack of supportive legal framework is one of the formidable problems for e-voting adoption in Nigeria. Despite the applaud ICT receives; policy issues continue to impede voting system adoption. For example, Nigeria Vision 2020 (2012) policy document stressed the viability of ICT as the central nerve with much promise to lift the country to a greater height. According to the document, "ICT presents Nigeria with great opportunities

to promote her growth and development . . . The Government of Nigeria under current Administration has already demonstrated its readiness to use ICT as a strategic transformation lever for Nigeria's development . . ." (National ICT Technical Working Group, 2009, p 8).

Paradoxically and in contrast to the position stated above, Section 52(1) (b) of the Nigerian electoral Act 2010 as amended, has categorically prohibits the use of electronic voting machine to conduct election. The Section reads, "The use of electronic voting machine for the time being is prohibited". Therefore, Jega, the INEC boss stressed that the Act is a legal hiccups deterring the Commission from conducting free, fair and credible election using e-voting system. Jega appealed for legislative intervention to amend the Act stating,

> *. . . the National Assembly should remove that provision in the Electoral Act which prohibits electronic voting because it is a major hindrance right now. . . . because of that prohibition, we can't even attempt do it, and the whole world is moving in the direction of increasing the use of technology in order to have credible elections. So what INEC has recommended is that when the legal framework is now being reviewed, that provision about prohibition of electronic voting should be removed* ("INEC Website", 2012).

The foregoing impending contradiction brought to limelight, a fundamental challenge of legal framework in the quest to exploit robust voting technology as viable option to improve election in Nigeria.

2.7 Summary

This section highlighted that notwithstanding abundant human and natural resources, history of political and administrative corruptions, weak institutional capacities and failed policies have exposed elections in Nigeria to various dastardly rigging techniques. Various attempts to adopt technology related measures such as e-voters' register to address problems of elections is not without fundamental challenges that has not been fixed. With impoverished larger segment of population, and questionable sincerity as well as capacity of the government to implement sophisticated project such as e-voting system of election, e-voting adoption in elections may either be a panacea to decreasing voter turnout or further entrench digital divides and triumph of elites domination of the political process. With this background information on the historical, socioeconomic and political milieus of Nigeria, the ground is set for literature review.

CHAPTER THREE

LITERATURE REVIEW

3.1 Introduction

In view of the relevance of e-voting to the broader fields of e-government, this chapter presented an overview of e-government, e-administration, e-democracy and e-governance. The chapter also contained reviewed literature on the underpinning theories premising the research study. Also reviewed, main constructs of the study. Thus, intention to participate, perceived trialability, perceived observability, trust in the technology, trust in the electoral government officials, trust in the politically elected government officials, computer self-efficacy, perceived ability to use and perceived relative advantage. Also reviewed and synthesized were literatures for the development of hypothesis. Summary of the chapter was presented at the conclusive part.

3.2 Strategic Position of e-Voting within e-Government

e-Government is far beyond establishing government presence on net or changing administrative work from paper-based to paperless office. Instead, it is a total transformational process where citizens and business can be supported through mutual interaction and stimulation of principles of good governance that involve shift in priority to end user centric.

e-Government is defined as use of ICT to improve government process and activities. For example, Basu (2004) conceptualizes e-government as transformational drive; a

government agency is design to achieve in its relationship with citizens, business corporations and other government agencies using information and communication technologies. e-Government is also defined as the use of information and communication technologies by government agencies to provide needed support, and effective services delivery to external and internal clients with the sole aim to transform relationship between citizens, businesses and other government agencies (UN - DPEPA, 2001). Deduce from the definitions, application of technology in the government business known as e-government has creates a new set of rules, new pattern of relationship among e-government clients, new styles of leadership, new strategies, new ways of listening to citizens and communities, as wel as new ways of organizing and delivering information. e-Government is therefore a synthesis of mutually inclusive systems comprising of e-democracy, e-administration and e-participation in a drive to good governance. Figure 3.1 below is a diagrammatical representation of relationship of e-government, e-administration, e-participation and e-democracy within which e-voting stems.

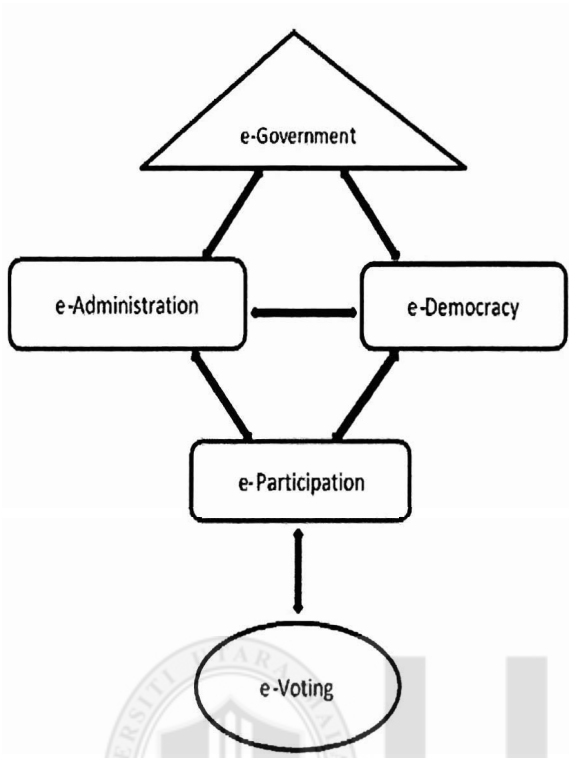

Figure 3.1. Model of e-voting within e-government initiative

Figure 3.1 above depicts diagonal representation of strategic position of e-voting within the context of e-government. e-Government has internal and external objectives that are so distinct. While the internal objectives is to facilitate a speedy, transparent, accountable, efficient and effective process for performing government administrative activities through back office, external objectives concern with facilitating speedy, transparent, accountable, efficient and effective interaction with the public, citizens, business and other agencies through front-line office thereby satisfying public needs and expectations by simplifying the interaction with various online services. As stimuli for good governance, e-government is strategically designed to offer support to tripartite domains of government, business, and individual citizens. e-Governance is a means to achieving an end, which is good governance (Basu, 2004).

It is worthy to note that in planning for e-government, and implementation of new technology, the robust nature of the technology is not as important as the risk of accepting it (Navarra, 2011). The task ahead is to measure the risk, better understand it and appropriately manage it. The need to understand factors associated with the state's standards and policies in order for an integrated ICT to triumph is therefore advocated. Developing ICT infrastructure and diffusion is dependent upon dynamic relationships between actors that enjoy stake in coordination, development and future growth of the technology. Specific objectives of e-government, e-administration and e-governance are presented in a Table 3.1.

Table 3.1

Relationships between e-Government, e-Administration and e-Governance

e-Government	e-Administration	e-Governance
Policy coordination and implementation; delivery of services online	Internal and public sector management component	Facilitation of interactions between citizens, government organizations and elected offices including governing and policy-making process
Developing citizen-centric programs	Strategic planning in transitioning to electronic delivery of services	How technology (particularly the web) is transforming governing process
Promoting and enhancing citizen participation	Quantifying cost effectiveness of electronic service delivery	e-Federalism: the changing relationship among the levels of government; and e-democracy: enhancing citizen participation online voting, issue of ethic, security and privacy
Perfecting online service delivery through analysis and evaluation; measuring efficiency and benchmarking against other forms of service delivery	Benchmarking and performance measurement	Legislative and policy-making environment framework; policy initiatives governments are taking: the regulatory framework, implications of initiatives like recognizing the legality of e-signatures, greater citizen participation in policy making environment (e-democracy)
Country indexing (performance measurement benchmarking) portal analysis, website analysis	Human resource management issues like training and recruitment, deployment of staff and maximizing existing resources	International implications: lowering of borders through information exchanges impacts and consequences; international standards and best practices; information management and e-government

Source: UN - DPEPA, ASPA (2001)

Kolachalam (2002) identified four beneficiaries of public agencies IT, thus:

i. Citizens — G2C applications (license renewals, benefits status, taxes)

ii. Businesses — G2B applications (permits, payments and filings)

iii. Employees — G2E applications (personnel systems and intranets)

iv. Other agencies — G2G applications for reporting and funds transfer

3.2.1 e-Administration

Offering government services and information to the public using electronic means provides new concept of public administration known as e-administration. e-Administration is a paradigm shift over the traditional approaches of public administration that seemingly employ use of electronic devices to relate information and render public services to the clients towards a more inclusive, open and participatory service delivery. As precondition for the successful implementation of e-democracy, e-administration premise within active participation of citizens and transparent decision-making processes, which is an essential ingredient for good governance.

In an administrative setting where ICT is applied, the traditional administrative complexities including uncertainty, inefficiency, red tape, and bureaucratic bottleneck resulting from paper work demise to pave way for emergence of modernity characterized by observance of rule of law that stimulate better relations between citizens and government machinery. It is hypothesized that ill management of election that seems to pose serious threat to citizen-public institution relationship, causing political apathy and turning the polity into a horrible atmosphere (Yakubu, 2012) can be overcome by transforming manual office to electronic paperless office. The overall goal is to improve productivity and performance using ICT tool.

Given that e-administration is aim to achieve better e-governance through introduction of effective mechanism of transparency and accountability, the focus is citizen-centric rather than organization-centric. The new theoretical approach improves time saving, simplification of procedures; better office and record management; reduction in corruption; and improved attitude, behavior and job handling capacity of the personnel involved.

The evolution of internet in 1990s marked the emergence of e-administration studies as a dominant field of administration. Technology adoption is increasingly becoming strategic to exploring organizational performance, hence, acceptability of technology become a cornerstone to researchers and practitioners to explore performance to the fullest. A key to improvement of public sector efficiency lies on successful automation of administrative procedures that is promising in ensuring effectiveness, transparency, accountability, competitiveness and above all, participation (Basu, 2004).

In this regard, advent of e-administration draws the art of public administration nearer to citizens which is a demonstration of true democratic practices that avail better opportunities for efficient utilization of government resources, mutual interaction and positive participation in policymaking. e-Administration is a component of e-government responsible for simplifying administrative complexities (Batalli, 2011; Matei & Iancu, 2009).

3.2.2 e-Democracy

It is worthy to note that election is a vital requisite for representative democracy to triumph. As a sine qua non for democracy to thrive and flourish, election must be sufficient to ensure coherent democratic practices where citizens' civic rights to vote is guaranteed and

citizens' participations are encouraged with sufficient transparency (Fernandez et al., 2013). The need for robust technology is stressed to strengthen citizens-public institution relations towards ensuring good governance practices.

The triumph of technologies for democracy such as e-voting set in motion the argument for the possibility of practicing direct form of democracy involving large population and even making the representative democracy more responsive (Coleman & Gotze, 2001; Van de Donk, De Snellen, & Tops, 1995). The paradign shift can be achieved through various forms of technology supported public participation (Coleman & Gotze, 2002) such as opinion polls, referenda, political deliberations etc. Thus, mechanisms through which clients are provided with important knowledge, service and legitimate coordination form the central thrust of public institution, which democracy sets to achieve.

Impact of technology on democracy is only beginning to research and understood, hence the "need for a better knowledge of the micro dynamics of political participation and communication, and how ICT's intervene in these processes" (Oostveen & Van den Besselaar, 2004, p 14). The situation brings to relevance, the technology determinism recognizing that successful outcomes (performance) of public agencies are contingent upon availability of viable and advanced technology. It further views technology as a catalyst for organizational change, and hence, technologies such as e-voting, a components of e-government have the potentials to increase participation in democratic process (Carter & Belanger, 2012; Grant, Hall, Wailes, & Wright, 2006; MacKenzie & Wajcman, 1999; Williams & Edge, 1996).

The question is now about assessing the impact of technology-mediated participation such as e-voting and its potentials to increase participation as an integral part of governance. Whether perception of citizens about technology-mediated voting process can influence elections participation is therefore not very clear.

3.2.3 Participation, as a Basic Component of Governance

Public agencies exist to serve the interest of the public through efficient and effective service delivery and that greater input from public participation into public decision enables resources allocation to reflect the interest of the public thereby enhance performance of the public agencies (Neshkova & Guo, 2011). The rationale behind public participation is to ensure those affected by policy outcome have profound and meaningful influence over the policy process. Direct public participation in administrative decision is a step toward ensuring good governance that has been advocated and canvassed by scholars of various wings (Dahl, 1989; Neshkova & Guo, 2011; Urbinati & Warren, 2008).

The quality and acceptability of administrative decisions are essentially determined by degree of public inclusion (Thomas, 1995). Two-way benefits of public participation in administrative decision can be distinguished. From the citizens' end, it empowers the ability of the citizens to engage in constructive participation and is considered desirable by the communities while from the administrative viewpoint, it provides important input that enable improving the performance of public programs (Neshkova & Guo, 2011).

Traditional perspective to citizens participation hold a negative view of citizens' participation into policy process due to costs of participation (Irvin & Stansbury, 2004;

Irvin & Stansbury, 2004; Robbins, Simonsen, & Feldman, 2008; Thomas, 1995), fear of losing control of the process, (Kweit & Kweit, 1984; Moynihan, 2003), and misrepresentation of public interest (Heikkila & Isett, 2007; Robbins, et al., 2008). Although the traditional perspective is not very explicit on the effect of participation on service delivery, it cannot be grounded completely as constructive participation requires being adequately informed and educated on public issues and interest with clear understanding of the trade-offs associated with participation, which most communities of developing countries are grossly lacking. In which case, participation can be burdensome and propel confusion.

Positivist contending perspective advocates public participation as facilitating engine to better policy formulation and implementation decisions capable of engendering efficient and effective service delivery of the public agency (Beierle & Cayford, 2002; Fagotto & Fung, 2009; Fung, 2009; Sirianni, 2009; Stivers, 1990). The perspective hold by this school of though is instrumental in analyzing the normative and instrumental benefits that could be derived when evaluating effectiveness of citizen participation. For instance, Irvin and Stansbury (2004) identified such benefits from process oriented (public knowledge and greater cooperation) and outcome oriented (better policy formulation and implementation) standpoints. Nabatchi (2010) distinguished four great values of participation comprising of (i) intrinsic benefits/value in and of itself regardless of outcomes; (ii) educative and empowerment of citizens' skills and dispositions through increased knowledge of the policy process (iii) capacity building of the entire community; and (iv) instrumental benefits for policy and governance.

The view stressing the fact that bureaucrats make decisions based on their narrow specialized knowledge (Beierle & Cayford, 2002; Dahl, 1989) brings the importance of resourcefulness of citizens as problem solving partners in progress that can help in understanding circumstances that otherwise might not be foreseen by the bureaucrats. Through participation, citizens can provide context specific information with considerable accuracy that can translate into achieving broad public goals that otherwise might not be possible; instead, decisions may suffer avoidable errors (Fung, 2004). Complexities associated with absence of modalities pose challenges to bureaucrats-public participation relationship.

Holistic problems solving strategies based on context specific with clearly defined task and procedure is imperative in strengthening public participation cum public decision nexus (Fung, 2004; Sirianni, 2009), most especially through qualitative participatory mode of inquiry. In the same vein, similar appeal is made in the context of governance that citizens' involvement in administrative decisions can harmoniously geared towards harnessing overall objective of the agency based on community needs (Stivers, 1990, 1994). Citizens' participation according to Moynihan (2003) induces innovative solutions to public problems, and ensures allocative and managerial efficiency of the public agency.

3.2.4 e-Voting System and Increased Participation

Contending views from political science literature argued that the claim concerning potential of e-voting to enhance civic participation is a mere hope, and even if it does, is out of curiosity of the technology that is often temporal and demise with time; instead, e-

voting entrenches digital divides (Oostveen & Van den Besselaar, 2004; Van den Besselaar, Oostveen, De Cindio, & Ferrazzi, 2003). Despite the criticism, advocates of e-voting maintain that technology such as "internet can create an opportunity to convert increased voter registration into increased voter participation" (Done, 2002, p 15).

A number of studies have identified the importance of e-voting toward increasing participation (Alvarez & Hall, 2004; Browder, 2005; Carter & Belanger, 2012; Eggers, 2005; Yao & Murphy, 2007), by approximately 42% (Done, 2002). The advocates count on maximization of voters' convenience, accessibility, costs of voting, and costs effectiveness as obvious reasons for potential increase in voter participation (Alam & Tamura, 2012; Belanger & Carter, 2010b; Carter & Belanger, 2012; Dictson & Ray, 2000; Fernandez, et al., 2013; Kozakova, 2011; Norris, 2004). Other studies emphasized on security, secrecy, privacy and accuracy of the system (Svensson & Leenes, 2003; Yang, Tu, & Yen, 2009; Yao & Murphy, 2007).

Accordingly, effective implementation of technologies is significantly related to the extent to which various categories of users are involved at the early stage of the design and implementation of technologies (Cherkasky, et al., 2000; Greenbaum & Kyng, 1991; Schuler & Namioka, 1993). Yet few studies on the impact of voting system to increasing political participation are available, suggesting for additional research studies (Carter & Bélanger, 2012). If properly explored, conveniences associated with voting system would be a remedy for low participation among citizens (Bélanger & Carter, 2010; Browder, 2005; Done, 2002).

However, the question of whether technology-based voting system (e-voting) can increase participation in election among communities with less educational and socioeconomic background, and less technology savvy such as northeastern part of Nigeria is not very clear. The circumstances vigorously crave the need for research inquiry. This study is aimed at examining e-voting system adoption as it influences voter turnout with particular reference to Nigerian context.

3.3 Behavioral Intention

As an extension of the theory of reason action, Ajzen (1988) propounded the theory of planned behavior, which improved upon the limitations of the former in explaining behavior in a situation when people have no volitional control. Individual intention to perform a given behavior is pivot to both Theory of Reason Action and the Theory of Planned Behavior. According to Ajzen (1991), intention entails motivational factors that affect a behavior. It means the extents to which individual is willing to try including amount of efforts they are planning to exert in order to perform a behavior.

Human behavior is largely predicted by behavioral dispositions such as personality traits and social attitudes (Ajze, 1988, 1991; Campbell, 1963). Presumably, intention influences performance so long an individual has a control, while performance increases with persons' behavioral control as motivation to an extent of making try. Ajzen (1991, p 181) stressed, "As a general rule, the stronger the intention to engage in a behavior, the more likely should be its performance".

Ouellette & Wood (1998) explained that intention can consciously predicts behavior by a mechanism of control reasoning processes and that "intentions are formed from silent beliefs about the outcomes of an act" (p 54). Therefore, intention is a reflection of attitude towards the behavior of performing an act whose consequences is perceived as favorable. In this case, attitudes are linked to behavior through their effect on behavioral intentions. It was urged that individual behavioral intention influences his/her behavior only if the behavior in question is under volitional control.

> *Intentions to perform behaviors of different kinds can be predicted with high accuracy from attitudes toward the behavior, subjective norms, and perceived behavioral control; and these intentions, together with perceptions of behavioral control, account for considerable variance in actual behavior . . . . behavioral intention can find expression in behavior only if the behavior in question is under volitional control i.e. if the person can decide at will to perform or not perform the behavior* (Ajzen, 1991, p1).

Nonetheless volitional control, performance of some behavior to some degree is contingent upon non motivational factor such as availability of requisite opportunity, resources including time, money skills etc. In this regard, Ouellette and Wood (1998) explained that motivational factors, peoples' ability and opportunity determine conscious intentions to perform a task. In other word, people consciously engage in sorts of reasoning depending on the level of motivation, ability and opportunity. Establishing intention requires multitude to processes depending on the kind of the behavioral and how easy or difficult to anticipate changes in the environment. For the intention to be retrieve from memory or from heuristic cue, minimal effort and superficial though is required (Ouellette and Wood). However, forming intention may involves extensive, thoughtful and systematic analysis (Eagly & Chaiken, 1993).

In accordance with TPB (Ajzen & Fishbein, 1980), behavior is determine by intention to perform the behavior, which inturn is influenced by person's attitude and belief toward the behavior. 'Behavioral intention to use' is a powerful determinant of actual use as well as predictor for future use (Feng, 2012; Mathieson, 1991). Individual decision of whether to adopt a system or reject is contingent upon behavioral intention and hence, an importance decision tool to policy makers, system developers, technology enterprise, merchandisers and consumers (Jackson, Chow, & Leitch, 1997).

Conclusively, Ajzen, 1991 argued that effects of interactions between intention (motivation) and behavioral control (ability) are major determinants of behavioral achievement upon which several theoretical propositions concerning learning, cognitive task performance, perceptions are based. However, despite evident of plausible interactions of intention and behavioral control as determinant of behavioral achievement, limited attention has been accorded (Locke, Mento, & Katcher, 1978).

3.3.1 Intention to Participate in Election Using e-Voting System (ITP)

Albeit as important, various psychological-based and information system theories and models such as the TRA by (Ajzen & Fishbein, 1980), the TPB by (Ajzen, 1991), Self-Efficacy Theory (SET) by (Bandura & Adams, 1977), Diffusion Innovation Theory (DoI) by (Rogers, 1983), the TAM by (Davis, 1986) and the Unified Theory of Acceptance and Use of Technology (UTAUT) by (Venkatesh, Morris, Davis, & Davis, 2003) have been developed and deployed or adapt to evaluate psychological concept intention to adopt

across variety of innovations and technologies. Consequently, various fields of study across life science, engineering, agriculture, marketing, information system, management, administration etc. have adopt the use of 'intention to use' to study specific characteristics of innovations or individuals.

In view, combinations of nomenclatures have been used to refer to the same psychological concept 'intention' depending on the needs or the system under study. Use of open 'intention to use' (Pousttchi & Wiedemann, 2007; Qutaishat, 2012), intention to adopt (Carter & Bélanger, 2005; Lee, Yan, & Joshi, 2011), intention to purchase (Lin, 2007; Ling, Chai, & Piew, 2010; Su & Huang, 2010; Wang & Pho, 2009; Zarrad & Debabi, 2012) and intention to participate (Khorshidi, 2012; Lin, 2006; Yao & Murphy, 2007) are abundantly evident. Intention to use refers to the individual's motivation regarding the performance of a given behavior (Gagnon, 2006). Srite (2006, p 7) defined behavioral intention to use as "the strength of an individual's intention to perform a specified behavior". Participation intention is defined as "the extent of the voter's intention to participate in a particular public election using 'remote electronic voting system' REVS" (Yao & Murphy, 2007, p 110).

Critical look at the pattern of using phrases such as intention to use, intention to adopt and intention to participate in adoption research symbolizes mere expression of semantic differences nevertheless, aim to examine important aspect of micro level of analysis "behavioral intention". Thus, to understand individual preferences/decision in relation to innovation of interest to the researcher. From the foregoing apparent similarities between, for example, intention to adopt, intention to use and intention to participate led to using them interchangeably (Khorshidi, 2012; Carter & Belanger, 2005; Yao & Murphy, 2007).

Sæbø, Rose and Flak (2008) defined participation as sense of taking part in some communal activities or decisions. Intention to participate using e-voting system adopted in this study is aim to examine individual decision to either take part in election using e-voting system or not to take part. Being a technology-mediated political participation research, intention to participate in the context of this study placed priority in the goal of using the technology, (participation) while recognizing the technology, (e-voting) as a medium. Information system literature found that intention-to-use is a strong predictor of actual system usage (Colesca, 2009).

Intention to use or not to use a voting system can translate into a decision either to vote or not to vote (Yao & Murphy, 2007). Investigating whether voters' perception to intrinsic characteristics and operational variables of e-voting system can influence participation intention in the election is a worthwhile. e-Voting adoption has multidimensional traits including technological, social, behavioral, economic, organizational, and political with an alternative outlet reflecting different behavioral outcomes for developing beliefs, attitude and intention to adopt. For this reason, technological attributes, trust, computer self-efficacy are important aspects to evaluate intentions. In the context of this study, we adopt 'Intention to Participate' to mean intention to participate in election using e-voting system written in short form as ITP.

3.4 Existing e-Voting Adoption Models/Framework

A number of e-voting adoption models and frameworks have been developed in various context across the globe. Subsequent to review of e-government adoption literature by

Carter and Belanger (2005), Schaupp and Carter pioneered empirical model of e-voting adoption in 2005. Schaupp and Carter (2005) model integrated constructs from e-government model, DoI, Technology Acceptance Model and Web Trust. Consequently, several empirical study on e-voting adoption started to emerge. For instance, Carter (2006) examined the effect of propensity to vote, internet factors, political factors and demographic factors on I-voting adoption. Furthermore, Carter and Belanger (2012) analyzed the effect of accessibility, convenience, relative advantage, political interest, political efficacy, party mobilization and trust on I-voting use.

In a related development, Belanger and Carter (2010) investigated the impact of the digital divides variables on I-voting adoption. Similarly, Powell et al. (2012) analyzed the effect of digital variables in the relationship between performance expectancy, effort expectancy, trusting variables computer anxiety on online voting system. Variability in voting condition including city, gender, age, educational level, computer competence were used to assess participants' voting experiences between voting machine with paper audit trail and voting machine without paper audit trail (de Jong et al., 2008).

A model that assessed the effect of availability, ease of use, mobility, privacy and accuracy on intention to participate remote electronic voting system were developed (Yao & Murphy, 2007) whereas Carter and Campbell (2011) assessed the effect of relative advantage, compatibility, trust of the internet, use of e-government information and use of e-government information on intention to use internet voting. Furthermore, impact of accessibility, convenience, disposition to trust and internet trust on perceived usefulness of internet voting as predictors of remote internet voting was conceptualized (Carter & Campbell, 2012).

Although empirical study on e-voting experience of other countires especially of advanced democracy is scarcely availables, larger portion of such literature concentrate on American experience as almost all the aforementioned models and frameworks were developed and tested in the country. Very limited e-voting literatures are available on developing countries of Africa (Albert, 2009; Jegede, Aimufua, & Akosu, 2009), especially Nigeria (Ahmad, Abdullah, & Arshad, 2015a, 2015b; Asogwa, 2013; Ayo & Azeta, 2009; Dewa, 2009). Even the limited available literature nonetheless conceptual, rarely focuses on socio-psychological perspective of citizens.

Recently, Salimonu et al. (2013) conceptualized framework on acceptance of e-voting system in Nigeria. The model integrated DoI theory, Technology Organization Environment (TOE) framework and Iacovou, Bebasat and Dexter (1995) framework. However, being a case study of INEC, the model conceptualized e-voting adoption from macro, organizational viewpoint, emphasizing on how innovation diffuse in formal organizational setting. The model focused on examining the perception of operational staff of INEC to understand e-voting adoption at organizational level as an alternative method of conducting acceptable elections in Nigeria.

Although, Salimonu's et al. (2013) model and our study may relatively share some similarities, differences between the two studies are as wider than one can imagine. To the best knowledge of the researcher of this study, voters perspective of e-voting system as an important requisite for diffusion and how the adoption affect voters' turnout is rarely researched. This existing lacuna underscores the significance of this research.

Moreover, in contrast to the existing models, our study empirically examines e-voting system adoption from voters' socio-psychological viewpoint, emphasizing how citizens'

adoption of e-voting affects voter turnout. It integrates technological attributes of e-voting system from DoI theory; institutional trust, computer self-efficacy constructs and rational choice theory. In addition to integrating relevant theoretical constructs to examine voters' participation in election using e-voting system, our study explored challenges of e-voting adoption outside the box using in-depth interview from the participants.

3.5 Underpinning Theory

Theory is meant to provide plausible explanations of a segment of a phenomenon. Social theories therefore are not in themselves all-encompassing as they provide distinct often complementary views or multiple views about a social phenomenon. As there is no a single social theory that captured the entire social phenomenon, combination of relevant theories to explain social phenomenon within a specified context would provide new insight to understanding the phenomenon and a glimpse for theorizing.

Combinations of various theories and models have been used to study factors that affect voters' intention to adopt e-voting. Therefore, testing a model that combined constructs drawn from relevant theories and models is not a new phenomenon in the field of social science research. Considering the proposed e-voting system in Nigerian context, literature on factors influencing voter cognitive decision to participate in elections using e-voting and the need for parsimonious model, this study combined Rational Choice Theory, Diffusion of Innovation Theory, Self-efficacy Theory and Trust Model to explain the relationships between the variables of interest.

3.5.1 Rational Choice Theory of Voting Participation

A modern theory of voter participation also known as voter turnout could be traced to a Riker and Ordeshook (1968) model developed after gaining insight from previous works such as Downs (1957) and Tullock (1967). Riker and Ordeshook propounded a model of voting participation using calculus on why a voter participate or abstain from voting. The model is known for its costs and utility exchange/tradeoff, which uphold the assumption that for a voter to participate in voting, the utility/benefits of voting must be so overwhelming.

Small change in the voting costs can cause a significant effect on turnout rate (Riker & Ordeshook, 1968). In addition to costs of election, they further modified the voting calculus of incentive influencing voter to participate, adding a notion of consumption benefits. Accordingly, a voter participate in voting if the consumption benefits derive from voting such as fulfilling one's civic obligation is greater than the costs of voting. It is argued that closeness of the election is a major incentive for a rational voter cognitive decision to participate has significant correlation with the rate of turnout (Blais, 2000).

Rational actor model has a great deal of the paradox of participation and hence, analysis of the voter turnout has been the main preoccupation of researches into rational choice models of participation (Ferejohn & Fiorina, 1974; Silberman & Durden, 1975; Uhlaner, 1989). As such individual preference formation and filtering regarding the usage of voting system is within the purview of the theory.

Given a wide range of research into rational choice theories, various nomenclature has been employed referring to rational choice model. Selective incentive as another term in

reference to rational choice is commonly used to explain the paradox of participation in voting context and indeed the most successful. The approach provides plausible explanations for participation in voting solely based on calculation of costs and benefits individual is anticipated from the outcome. Selective incentive approach is self-interest centered rather than collective utility. Its strength is based on incentives that motivate individuals to participate in voting.

Several selective incentives have been identified to have influence individual to participate in voting. For example, economic motivation as a basis for voting participation has been extensively discussed in literature (Conover & Feldman, 1986). However, Riker and Ordeshook (1973) viewed it from the satisfaction a voter drive from the outcome of the voting, which may not be available for those who do not participate in the voting activities. Thus, satisfaction drives from the complying with the ethic of voting; with the affirming allegiance to the political system; with affirming a partisan preference (Riker & Ordeshook, 1973). Other voting benefits/preference include closeness of the election (Blaise, 2000), duty payoff (Riker & Ordershook, 1968), social welfare (Harsanyi, 1977), social duty (Matsusaka, 1995), and altruism (Monroe, 1994).

Fedderson and Sandroni (2006) argued that voting costs and benefits could be either exogenous or endogenous (intrinsic). They explained exogenous and endogenous motivators to mean that some voters receive their payoff for voting participation, while other group of voters receives their payoff for not voting. The explanation however, did not cover a broad view of intrinsic and extrinsic incentive to a voter as significant determinant of voting participation.

Although rational choice models have since recognized impact of socio-psychological factors such as developing appropriate mental inclination (if the voter have a sense of citizen duty) (Matsusaka, 1995). Rarely previous attempt establish a link between voter inner conviction about credible and integral attributes of e-voting system and the trust in the political institutions as important determinants of voting participation despite obvious interconnectedness. This brings to relevance our proposition, suggesting that individual voter cognitive decision to participate in voting would be influenced by voter anticipated satisfaction with the credibility and integrity with the voting system as well as trust in the political institution.

Despite strength of selective incentive approach to explaining costs and benefits determinants of voting participation, the approach is faced with difficult implications concerning high cost types of participation. The assumption that whether it is rational to calculate costs and benefits of collective action such as voting even when such costs and benefits are trivially very little is questionable (Niemi, 1976; Aldrich, 1993). In addition, the approach is confronted with the dilemma of explaining very high-cost type of participation such as involvement in party activism or campaign (Whiteley, 1995). Rapoport, Abramovitz & McGlennon, 1983 and Seyd and Whiteley, (1992) explained that policy goals is a focal interest of political activists. It has been postulated that individual participation may be motivated by policy and that policy goals are collective utility rather than individual goods.

Furthermore, Simon, 1978, 1982; Harsanyi 1986 pointed out that rational choice models place excessive demand on the cognitive capacity of individuals even in the circumstances of uncertainty that is beyond their ability. Keynes (1936) argued that in circumstances of

radical uncertainty, it is ridiculous to calculate probabilities in order to determine expected values of costs and benefits of decision-making. Attempt to fix the seeming theoretical gap led to emergence of several approaches to dealing with the paradox of participation in connection with rational individuals' participation in politics keeping in view circumstances when voters have influence over the outcome or not.

a. Rational Choice as Game theory

A group of scholars sees rational decision theory embedded in game theory and subsequently aligned the two (Ledyard, 1981, 1984; Palfrey & Rosenthal, 1985; Rasmussen, 1989). Voting game approach negate the notion of consumption benefits to voting while emphasizing on the assumption that a voter cares about influencing the outcome of election and that costs to vote are strictly positive. The approach rallies around the assumption that collective action problem emanate from game theory that employ the use of folk theorems of prisoners dilemma game to explain collective action (Rasmussen). Although, Folk theorem is often use to analyze the problems of cooperation in circumstances where central authority is not well established (Axelrod, 1984), it can equally adopt into a paradox of nonparticipation.

This particular argument center on whether and how active members of a group punish or motive non-active members to participate by imposing a type of sanctions especially when nonparticipation of the latter exert no significant effect on the outcomes. The strength of this model lies in placing candidate as strategic actors presumably that when candidate A and B take distinct positions would lead to positive turnout in equilibrium. It also claims

pivotal of voting and that everyone has incentives for voting. The model however, did not explicitly provides plausible explanation on the magnitude of turnout in a situation where candidate have distinct positions.

Palfrey and Rosenthal (1985) however provided explanation on the magnitude of turnout in a voting game where a voter is faced with a choice of casting a costly vote for his/her decided candidate or not voting in which case, costs of voting are identical for each voter. According to Palfrey and Rosenthal model, equilibria is divided into low turnout and high turnout, each is determined largely by generating low and high probability of being pivotal respectively. Meaning, by having nearly large identical numbers of voters supporting opposing candidate, could lead to achieving a high pivot probabilities whereas low pivot probabilities could be achieved by having supporters of each candidate randomize between turning out to support their prefer candidate with low probability and abstaining.

b. Rational Choice and Altruism Concern

A perspective to rational choice approach introduces altruistic concern into the participation equation that seeks to balance between self-interest and altruistic concern. This approach suggests that every other thing being equal, a rational voter takes into consideration utility of other voters when deciding whether to vote or not to vote. Decision of a rational voter whether to participate (vote) or not to vote is influenced by the utility of other voters. In addition to self-interest, this approach suggests that welfare of other voters serves as additional incentive for a rational voter to vote (Margolis, 1982).

Social choice theory is instrumental in evaluating decision-making system capable of providing hint/insight in constructing actual decision procedures that can aid in designing political institutions (Hylland, 1989). It concerns mainly with the extent to which an individual derive/maximize social outcome from a range of preferences, taking into cognizance, constraint of Pareto optimality. Social theory seeks to integrate a number of features implicated into a reality of complex economic, social and political processes into a framework. Here the most important elements of the theory consist of the set of individuals, their preferences, the options available to them and the right assigned to the options (Hylland).

c. Collective Rationality

The advocate of rational choice theories are confronted with a question of whether rational actor would participate in collective action in order to achieve a collective goal? (Whiteley, 1995). This cogent reason led to extension the notion of rationality beyond the calculation of the costs and benefits as the basis of individual's rational choice to participate to a wider 'collective rationality' that incorporates problems of group factors into the equation of participation. Under this model, rational individuals calculate costs and benefits of various courses of actions at the level of the group. However, group participation can be effective only if individual member participation is effective. Notion of collective rationality is distinguished from rational choice model. While rational action implies methodological individualism, collective rationality is an entity independent from individual member in it and that social (societal) preferences is not contingent upon the preference of individual member in the society (Sen, 1970).

Collective rationality entails decisions taking by individuals in a group focusing at the group level rather than own self-level. Collective rationality is therefore not only inconsistent with the rational choice theory but also lies outside the framework of it analysis. In accordance with collective rationality, behavior is inconsistent with rational choice framework because behavior is not a product of rational calculation of costs and benefits of individual action rather, a conditional response to the actions of other people.

d. Group Mobilization Model

The idea that adding consumption benefit for voting within the rational choice model brings the relevance of group-based voting model of mobilization to explaining voter turnout. The approach has a view of voter being belonging to group of like-minds who share similar preference over the candidate. The assumption of the approach is that a voter participate in election if they receive/perceive having consumption benefit. While emphasizing changes in consumption benefits as the central incentive, it renders irrelevance, the probability that an individual vote is pivotal.

The basic assumption of group mobilization approach/model is that leaders who earn policy preference of a group of voters who share similar ideology often determine level of voter participation. This is often achieved/done by the leader allocating resources to the voters or simply buys their votes. Therefore, mobilization model by Uhlaner (1989) distinguished two kinds of voting benefits, thus consumption benefit often determined by group leader and investment benefit that centered on the probability of a voter being decisive multiplied by the utility benefit of a candidate over the others.

Another line of theoretical proposition in relation to paradox of participation in voting context suggests that local mobilization/campaign have significant effect on voters turnout (Leighley, 1995; Kramer, 1970; Herrnson, 1986). However, it is always difficult to distinguish between electoral mobilization and rational choice model of participation as it is always not very clear as to why rational individuals who have acquired the much-needed information that would enable them make decision, should change their minds in response to the mobilization efforts of party agent. This is even more compelling when a rational individuals is convinced that the information supply by the stranger/agent is reliably impartial.

Mobilization can said to be a product of social norms that implies application of social pressure on individuals to conform to the wishes of others. In mobilization, other people are important agent for enforcing norms, expressing approval or disapproval of the behavior of the individuals. Social norms as incentive for participation cannot be easily analyzed within the standard rational actor framework because, they are neither rational nor based on the outcome of some utility calculus; instead, norms are dependent upon previously constructed pattern of behavior (Koffort, Miller, 1991, p 23).

Another dimension of mobilization model focuses on social pressure that hinge/anchor on followers to reward and punish each other at the instance of the leader. The social pressure assumption/view that voters leave in a social network that allow monitoring of voting behavior of one another is narrow to a small communities. It did not provides sufficient explanation on how group of voter A can punish group of voter B for defaulting in the event the former is not aware of the voting behavior of the latter especially in seemingly large voting communities.

It can deduced that rather than social sanctions, the key driver of election participation rely on moral persuasion, which makes leader ability to present compelling argument as the basic determinant of participation. This position exposed mobilization models incapable/ of providing sufficient account of individual decision to vote at micro-level.

However, despites explicit explanation on how leaders determine preference and voting participation of groups, macro level mobilization model is short of explaining how leaders influence voter decision preference at micro level. Group mobilization model is confronted with the difficulties/challenges to explain how group leaders pay/buy votes from members of a group most especially in developed democracy such as America given the illegality of vote buying and secret ballot system operated. Although the model fits most developing democracy such as Nigeria in which politics is often played alone lines of ethno-religious prejudices, group mobilization model is outside the scope of our study.

3.5.2 Diffusion of Innovation Theory

Change has a great deal in societal transformation. For development to occur, society is bound to change. Social change is achieved through injection of new ideas, innovations, practices, systems or technologies whereas people by their nature, resist changing. Nevertheless, the role of technology in bringing about social change is enormous. Therefore, to overcome the barrier for strong resistance to social change, a theoretical approach relate to the technology adoption known as Innovation Diffusion Theory (IDT) or the Diffusion of Innovations (DoI) provides comprehensive theoretical foundation on

how, why and at what rate these new ideas, innovations or technologies diffuse into a social system.

The concept of diffusion originated in the work of Tarde (1903) in his work the Laws of Imitation. However, Rogers was the first to give credence to contemporary diffusion theory following the synthesis of more than 3800 preceding classical diffusion literature of early 19th century. Although a sociologist, Rogers, originated DoI, the theory was primarily developed to study acceptance of new agricultural practice. Moreover, the theory has subsequently being diffused into other disciplines such as marketing, education, engineering, information system, and recently governance and public administration. The theory is therefore a multi-disciplinary and multi-dimensional in both outlook and approach. DoI is specifically relevance to public administration considering dynamic of technological evolution that has been overtaken various disciplines, public administration inclusive. Application of e-office, m-office, e-referendum, e-voting, e-government, e-participation have bring into stalk marriage of the two disciplines of public administration and information system with a number of research studies conducted to this effect.

Diffusion is defined as "the process by which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 2003, p 27). As a process, it is concerns with how innovation is distributed over time within and across society, and therefore it is both information gathering and uncertainty-reduction process (Argawal & Prasad, 1998b). An innovation is "an idea, practice, or object perceived as new by an individual or other unit of adoption" (Rogers, 1995, p 11). Diffusion of Innovations (DoI) provides comprehensive theoretical foundation on how, why and at what rate these

new ideas, innovations or technologies diffuse into a social system (Rogers, Singhal, & Quinlan, 2005).

Diffusion decision process mainly involves awareness creation, attitude change, decision making, implementation of the innovation and confirmation in this case of voting participation using e-voting system. Succinctly put, DoI theory is a generic process that cut across various systems, people, place and culture; involving various field of specializations such as agriculture, sociology, marketing, education, governance, information system, and therefore a multi-disciplinary and multi-dimensional in both outlook and approach (Agarwal, Sambamurthy, & Stair, 2000; Karahanna, Agarwal, & Angst, 2006; Rogers, 1995). Evaluating technological attributes of e-voting using DoI variables are therefore relevance for voting participation decision.

Rogers (2005) draws a distinctive line between adoption process and diffusion process. Diffusion process takes place within society as a group process or at macro level while the adoption process concerns with an individual or micro level. Diffusion process can best be determined by rate of adoption, which refers to the time taken for an innovation to be accepted by members of a social system. In rate of adoption, innovations are diffused over time in S-shape-like curve. In addition, individual undergo through five stages of adoption comprising of awareness, interest, evaluation, trial, and adoption based on speed rate of slow, gradual, relatively dramatic to rapid growth.

Similarly, Fichman (1992) categorized innovation diffusion studies into adopter studies and macro studies. Adopter studies focused on understanding the differences in adopter innovativeness while macro studies concerned with rate and pattern of adoption across

community. The categories led to a more splinter classifications of individual versus organization adoption based on locust of adoption; and Type 1 and Type 2 typology based on classes of technology.

Rogers' DoI is one the most prominently used theories in the study of technology acceptance. DoI is generic theory for adoption of innovation that has been used to study various technology and recently e-voting system (Schaupp & Carter, 2005). According to DoI theory, five characteristics of innovation (constructs) are principal antecedent to citizen adoption decision, thus: relative advantage, complexity, compatibility, trialability and observability (Carter & Belanger, 2012). The constructs explained from 49 to 87 percent of the variance in rate of adoption (Rogers, 1995).

Nonetheless, other equally important components of innovation that determining rate of adoption include the innovation itself (innovation-decision), the nature of communication channels, the social system in which the innovation is diffusing, and the influence of change agents (Rogers, 1995). Individual motivation status for adoption or innovativeness is another significance factor-affecting rate of adoption. By innovativeness, potential adopters are sequentially classified into innovators, early adopters, early majority, late majority and late adopter also called laggard (Rogers, 1983).

Innovation Diffusion scholars have continued to explore other components of innovation that influence system adoption and consequently extended the theory. The discrepancies reported in the diffusion literature prompted Moore and Benbasat (1991) study to examine possible reasons for the discrepancies and developed standard measurement for technology

adoption at individual and organizational levels as remedy that yielded to an extended model of DoI.

The assumptions rallied around the Moore and Benbasat new model hinged on where to place priority between the original primary attributes of innovation that are intrinsic to an innovation and independent from the perception of potential adopters. On the other hand, perceived characteristics of technology or secondary characteristics of the technology attempt to examine adopters' perception of the attributes of the technology. According to the study, original observability was composing of result demonstrability and visibility and hence, the split while image was curved from the original relative advantage attribute (Moore & Benbasat, 1991). Voluntariness as a variable that influences decision of the potential adopter to either accept or reject technology was added.

Summarily, the study redefined and extended DoI theory by adding four more relevant constructs namely demonstrability, visibility, image and voluntariness. The extended model is referred to as the Perceived Characteristics of Innovating (PCI). Later on, Speier and Venkatesh (2002) added switching cost construct. Other areas the theory received more attention include way in which innovation influences pattern, process and consequences of system adoption.

The study of Moore and Benbasat (1991) refuted trialability and observability as two separate entities neither relative advantage emerged as a factor. The similarities between relative advantage with perceived usefulness and complexity with perceived ease of use constructs of DoI and TAM respectively were postulated. Giving the immense contributions of Moore and Benbasat to the extension of DoI, the study implicated silence

of the original DoI constructs and simultaneous rise in popularity of the new variables in the subsequent diffusion studies.

More on the theory extension and modification, Surry and Farquhar (1997) classified diffusion studies into systematic change theories and product utilization. Systematic change theories focus on macro level of analysis aim to develop theories for organizational change, reforms and restructuring, while product utilization theories concern with micro level that intended to develop theories of system adoption and utilization of specific product.

Furthermore, diffusion related theories could be categorized into developer-based theories and adopter-based theories. The study is a solid golden pavement for diffusing DoI theory into both private and public sector organizations. To this effect, research studies offered some degree of delve into exclusively respective categories of the theories with rare effort to investigate the combine effect of the two blocks of theories in a single study.

Another interesting aspect of the theory extension, Agarwal and Prasad (1998a) incorporate personal innovativeness as a moderating construct between the antecedent of attitude and individual perception about new technology urging that personal innovativeness can explain individual difference with respect to how perceptions are formed and the subsequent formation of usage intentions. The effects of personal innovativeness as a moderator in the relationship between user perceptions of information technology and adoption decisions are being tested and confirmed (Agarwal & Prasad, 1998b).

Moderating role of other related innovativeness and ability to use constructs have been scarcely studied and reported in recent research studies. For example computer self-

efficacy (Chen, Yen, & Chen, 2009), perceived ability to use (Igbaria & Iivari, 1995; Shareef et al., 2011), computer anxiety (Scott & Walczak, 2009; Torkzadeh, Chang, & Demirhan, 2006). The constructs are rarely studied on e-voting system (Powell et al., 2012).

Considering combined pattern and process of diffusion research, postulations by Argawal and Prasad (1998b), Moore and Benbasat (1991) and Van Slyke et al. (2004) highlighted that adoption decision is predicated upon five key perceptions, thus: (1) characteristics of the technology, (2) characteristics of the user, (3) organizational characteristics, (4) task characteristics, and (5) environmental factors. These propositions laid the foundation for exploring the relevance of combined constructs from various characteristics in a research study depending on the needs and context (e.g. Chen et al., 2009). Based on this proposition, this study is designed to empirically test relationships of constructs drawn from the technological characteristics.

Understanding how social change occurs at individual, organizational and community units of adoption is the key to understanding the process, pattern and consequences of technological innovations. Therefore, Rogers conclude that diffusion of innovations research would continue to garner momentum from strength to strength as long as innovations continue to be generated and studied (Rogers et al., 2004).

a. Perceived Trialability (TRB)

Rogers (2003) identified trialability along other four constructs as the most influential variables that explain variance in rate of adoption. Trialability is defined as the perception

of the extent to which innovation is subjected to experimentation before actual adoption by the potential adopters (Rogers, 1995; Van Slyke et al., 2004; Taherdoost & Masrom, 2009). Trialability is also defined as the degree to which an innovation may be experimented on a limited basis before making an adoption or rejection decision (Tobbin & Kuwornu, 2011). The more opportunity is given to the potential adopters to experiment with an innovation, the more they feel comfortable and are more likely to adopt it (Tan & Teo, 2000). In this regards, the higher the trialability of the potential adopter the more likely adoption decision occur.

Trialability is an important construct that can be explored to provide hints on likely problems of technology before the adoption because, exposing technology to trial has the potential of reducing the risk, uncertainty and negative outcome it might likely impose (Rezaei-Moghaddam & Salehi, 2010, Moga, 2010). Trialability is an important determinant of voters' decision to participate in election considering the fix and irreversible nature of real voting exercise within the context of time and space (Yao & Murphy, 2007). From adoption viewpoint, trialability provides basis of comfort and motivation with the innovation to particularly early (potential) adopters thereby increased their chance of adoption (Tan & Teo, 2000; Uzoka & Ndzinge, 2009).

In the same vein, in a study by Moga (2010) trialability was found to have positive influence on intentions to adopt Internet banking services, thus, the greater the trialability of internet banking technology, the more likely the intention to adopt by the customers. Furthermore, Tsai, Chen, Hsu, Ko and Huang (2009) developed a model that explored the influential factors and their interrelationship with customer's adoption intention towards the integration of traditional Chinese and western medicine. The results of the study found

positive causal effect of trialability and customer perception and motivation towards the integration of traditional Chinese and western medicine in that the higher the tendencies to give the integration a trial the greater the likelihood of the customer's adoption intention.

Similarly, previous studies indicated that perceived trialability may be consider more important to earlier adopters than do late adopters (Moga, 2010; Tobbin & Kuwornu, 2011; Uzoka & Ndzinge, 2009) because, absence of any precedent arise the inquisitiveness of innovative individuals to try it before adoption whereas later adopters may have earlier adopters as precedence. By trying out the innovation, early adopters can be able to give meaning to it and therefore, trialability construct is well fit in circumstances where innovation is to be introduced the first time, such as case of e-voting in Nigeria. However, once the technology is implemented in full-fledged capacity, the needs for trialability eventually seize to exist (Rezaei-Moghaddam & Salehi, 2010).

Relatedly, the argument that trialability can be a basis for difference between various groups of adopters is contested in a study on consumer adoption of Multimedia Message Service (MMS) among Iranian subscribers by Shantiai and Kazemzadeh (2009) who found no significance differences of trialability judgment between innovators, early adopters, early majority, late majority, and laggards. Such results may be influence by the characteristics of the respondents and the technology under study.

Despite the importance of trialability construct as determinant of intention to adopt innovation most particularly at initial stage of diffusion, a number of studies dispute the construct as being a determinant of intention to adopt (Agarwal & Prasad, 1998a; Tornatzky & Klein, 1982) leading to facial neglect of the constructs in the subsequent

studies (Bhatt & Aggarwal, 2011; Sang et al., 2010). Even the few studies that used trialability as determinant factor influencing adopt decision reported non-significance effect of trialability on intention to use (e.g. Sheng, Wang, & Yu, 2011).

b. Perceived Observability (OBS)

Observability refers to the degree to which the results of the innovation can be observed. The higher the observability, the more likely adoption will occur (Tan & Sutherland, 2004). perceived observability is the perception of the citizen concerning the extent to which the innovation can be evaluated after trial (Hall, 2004). Rogers (2003, p 16) defined observability as "the degree to which the results of an innovation are visible to others". Perceived observability is bi-dimensional construct. In recognition to complexity of perceived observability construct, Moore and Benbasat (1991) split the construct into visibility and results demonstrability. Result demonstrability refers to the extent to which outcome of the use of innovation is perceived as tangible and apparent. Visibility refers to the extent to which outcome of the use of innovation is perceived as conspicuous. Second proof on the bi-dimensionality of perceived observability construct is embedded in perception of the potential adopter to directly observe, evaluate or demonstrate the results of the innovation in question or shared the results of the same or related innovation's observation and evaluation by proxy (third party).

Unlike perceived trialability, direct relationship of the innovation in question and the potential adopter is not necessary for the perceived observability as third party can do the job. Therefore, elastic nature of the innovation allows perceived observability to be a

pervasive construct. In addition, perceived trialability is terminal variable that expires with experimenting the innovation. Once the innovation is experienced, the relevance of perceived trialability vanished. Perceived trialability is an instant variable in which the potential adopter aspires to experiment. On the other end, perceived observerbility construct tries to assess aftermath either of experimenting the technology on limited basis or full-scale implementation. For this reason, perceived observability could be a good potential antecedent of perceived trialability.

Some diffusion research studies deliberately excluded perceived trialability and perceived observability constructs from their models for fear of possible non-significance contribution to variance of adoption (Carter & Bélanger, 2005; Chang & Tung, 2008; Sang & Lee, 2009; Sang et al., 2009). Nevertheless, influence of previous studies cannot be ruled out (e.g. Agarwal & Prasad, 1998; Tornatzky & Klein,1982). Interestingly on the contrary, Martins, Steil and Todesco's (2004) study conducted in Brasil on the use of internet as an instructional tool revealed perceived trialability and perceived observability as two most significant predictors.

Three explanations can be offered to the reasons why perceived trialability and perceived observability constructs of DoI are low-keyed in the extant research compare with the remaining three constructs – relative advantage, compatibility and complexities. First, consistent non-significant results of the duo (Perceived Trialability and perceived observability, secondly, thrive of other technology adoption theories such as TAM, UTAUT and TRA that emphasized more on the relevance of the three surrogate constructs of DoI (relative advantage, complexity and compatibility). Thirdly, later researchers have established plausibly similarities of relative advantage with perceived usefulness while

compatibility and complexity are both linked to perceived ease of use in TAM (Agarwal & Prasad, 1997; Carter & Weerakkody, 2008; Moore & Benbasat, 1991; Rouibah, 2009; Taylor & Todd, 1995; Venkatesh, et al., 2003; Yang, Lay, & Tsai, 2006).

c Perceived Ability to Use (PATU)

Search for appropriate terminology to refer to various perceived attributes of innovation has been an ongoing discussion among adoption scholars as "Some authors have previously observed some of the similarities across models" (Venkatesh, et al., 2003, p 426). Prominent example is the discussion surrounding complexity, perceived complexity and Perceived Ease of Use as important terminologies with composite function in the study of technology adoption.

Rogers (1983) defined complexity as "the degree to which an innovation is perceived as difficult to understand and use". Complexity entails that the more an innovation is perceived to be difficult to understand and use, the less likelihood of adoption. On the other hand Davis (1989, p 320) defined perceived ease of use as "the degree to which a person believes that using a particular system would be free of effort". From the definition, the higher citizens' perception of technology of being require less effort increase the likelihood of adoption. From the above, while complexity is a negative impression of the innovation, perceived ease of use has positive expression/impression.

Following paucity of scales to measure Rogers' (1983) complexity, Davis (1986) reconstructed the variable and renamed it 'perceived ease of use'. Moore and Benbasat (1991) further elucidated the idea of similarity between Rogers' complexity and Davis

Perceived Ease of Use providing supportive evidence. In another trajectory, Venkatesh et al. (2003) reviewed eight models, which eventually resulted in the development of a unified theory of acceptance and use of technology (UTAUT). Stressing the similarities of Perceived Ease of Use of TAM, complexity of Model of PC Utilization (MPCU) and ease of use of DoI, the model evolved 'effort expectancy' construct that incorporates the effect of the trio (Srite, 2006).

In a similar analogy of demonstrating similarity between complexity of DoI with Perceived Ease of Use of TAM though with inverse functions, Shareef et al. (2011) integrated the variables and renamed them perceived ability to use. Shareef et al. (p 31) defined perceived ability to use as "the degree to which a user of EG perceives his/her competence in and comfortable ability for using an EG system technologically, organizationally, and psychologically that match with individual's values, social needs, and overall attitudes". Perception of apparently new technology is an important aspect of the perceived ability to use the system and that perceived ability to use is an essential variable capable of predicting technology adoption among citizens. The construct is capable of assessing the perception of the potential adopter regarding technical or output quality of the technology (Shareef, et al.).

Perceived Ability to Use is an essential personal attribute for evaluation of e-voting adoption decision. Shareef et al. (2011) argued that perceived ability to use is a generic construct with vast implications that embedded attributes of technology adoption across various theories and model. Perceived ability to use is a perception (belief) of individual proficiency (positive attitude) toward handling the proposed technology, which in turn affect intention to use. Perceived ability to use as a generic construct integrated elements

of Perceived Ease of Use in TAM; complexity and compatibility of DOI, and perceived functional benefit (PFB) and has overlapping essence of perceived usefulness in TAM and relative advantage in DoI, and shared some essence of computer self-efficacy (Shareef, et al.). The construct perceived ability to use has technological and potential adopters' perspectives, therefore a pervasive with wide range adoption implications.

Resounding the particular interest to this research study is the influence of voter perceived ability to use on the intention to participate. Perceived ability to use is a determining factor capable of influencing voter intention to use e-voting system. The cause is mainly that an individual's unfamiliarity with the technology makes him worried that he might appear clumsy in front of others or worried that his ignorance may cause damage to the technology (Chuo, Tsai, Lan, & Tsai, 2011; Doronina, 1995; Igbaria & Iivari, 1995; Powell et al., 2012; Van Raaij & Schepers, 2008).

d. Perceived Relative Advantage (RA)

In the words of Lee, Hsieh and Hsu (2011, p 126), perceived relative advantage is defined as "the degree to which an innovation is considered as being better than the idea it replaced". Perceived relative advantage of e-voting system can therefore be defined as a degree to which benefits of e-voting is perceived to out-weight the existing traditional paper ballot system of voting. Rogers (1983) argued that the relative advantage has positive correlation with adoption rate making it one of the influential predictors of adoption decision.

Three dimensions appear important when citizens contrast advantages between the new technology and the precursor practices, thus economic benefits, image enhancement, convenience and satisfaction (Lin, 2007). In addition, social benefits, time saving and hazard avoidance are determining factors (Moore & Benbasat, 1991) when deciding to accept or reject a new system.

Stream of literature on information system have offered plausible explanations on the similarities of Roger's DoI construct, relative advantage with perceived usefulness of Davis' TAM; while complexity is also used (in reversed direction) interchangeable with Perceived Ease of Use (Carter & Belanger, 2012; Moore, & Benbasat, 1991; Plouffe, Hulland, & Vandenbosch, 2001; Sang et al., 2009; Schaupp & Carter, 2005; Taylor & Todd, 1995; Venkatesh, et al., 2003). Another similarity pointed out between the constructs is measuring perception about the characteristics of the technology (perceived) instead of the actual characteristics that is implicitly embedded in Rogers' DoI (Agarwal & Prasad, 1998a; Moore & Benbasat, 1991) and explicitly pronounced in TAM (Davis et al., 1986). The argument led to surrogate use of relative advantage, compatibility and complexity constructs with perceived usefulness and perceived ease of use in many research studies (e.g. Mallat, Rossi, Tuunainen, & Öörni, 2006; Rouibah, 2009).

The proposition on the seeming similarities of DoI and TAM constructs informed the decision of some researchers to examine the combined impact of selected constructs from DoI and TAM on intention to use technology (Carter & Belanger, 2005; Chang & Tung, 2008; Devi, 2009; Legrisa, Inghamb, & Collerettec, 2003; Mathieson, 1991; Moga, 2010; Salehi, Hayati, Karbalaee, & Chin, 2012; Wan Ismail, Hong Kit, Buhari, & Muzaini, 2012; Wu & Wang, 2005; Wu & Wu, 2005). In the course of adventuring this hybrid theory

permutation, a body of literature made Perceived Usefulness and Perceived Ease of Use a focal determining factor mediating the relationship between result demonstrability and intention to use (Kelly, Lawlor, & Mulrey, 2010); compatibility and attitude towards using (Calisir, Gumussoy, & Bayram, 2009; Chen & Tan, 2004; Karahanna et al., 2006); and compatibility, self-efficacy and attitude toward using (Chen et al., 2009).

Relative advantage entails citizens' perception of the gains receives from adoption innovative practice over the traditional practices. Having encompassing concept of Perceived Usefulness of the TAM, relative advantage has both relative and absolute benefits ranging from effectiveness, efficiency, availability, accessibility from anywhere, comfort in use, timesaving, cost savings, and convenience (Shareef et al., 2011). Going by this proposition, relative advantage is pervasive with vast implication among various adoption variables.

Howbeit, despite plausible similarities of perceived usefulness and relative advantage, mediating role of perceived relative advantage in the relationships between the DoI construct has rarely been investigated as glimpse of the literature reported accessibility and convenience as antecedent of relative advantage, which in turn influence intention to use I-voting (Carter & Belanger, 2012). Thus, accessibility and convenience are determinants of relative advantage as an antecedent of intention to use. The looming inconsistent findings trailing the effect of technological attributes, trusting constructs and operational research variables on adoption intention, nevertheless, potential mediating effect of perceived relative advantage of e-voting in the relationship between technological attributes, trust in the technology, computer self-efficacy, and intention to participate in election has not been explored despite implicit indication of the literature.

3.5.3 Trust Model

In realization of the need for researchers to communicate with the same language concerning the meaning of trust, McKnight and Chervany (2001) developed a trust model with four high-level constructs, also called typology of trust. The constructs, thus: disposition to trust, institution-based trust, trusting beliefs, and trusting intentions, which are further classified into 16 measurable sub-constructs all of which are linked based on the general pattern of the Theory of Reasoned Action.

Studies have recently identified trust as one of the construct influencing technology adoption. Trust refers to degree of reliance and confidence repose upon individual or group's ability to fulfill promises. Trust in Technology is contingent upon citizens' belief that the technology is in-dependable medium capable of providing accurate and secured transaction. Security, privacy, accountability and economic feasibility are the basic component of trust (Carter & Bélanger, 2012). Trust plays a central role in aiding perception of security and risk of technological system thereby determining ones intention to use. Trust perception of the medium of transaction is critical and complementary to characteristics of the technology such as usefulness and ease of use in the process of forming decision to use technology (McKnight et al., 2002).

a. Trust in the Technology (TIT)

Trust is an important factor to be considered when implementing e-voting. Literature stressed the important of trust as a determinant of e-government initiative adoption and a vital predictor of intention to use a wide range of sundry technologies (Belanger & Carter,

2008; Carter & Weerakkody, 2008; Colesca, 2009; Gefen, Karahanna, & Straub, 2003; Karavasilis, Zafiropoulos, & Vrana, 2010; Kotamraju & van der Geest, 2012; Pavlou, 2003). Other fields of study such as marketing find trust to be an important variable for innovation adoption leading to substantial research into the area. For instance, trust is used as determinant of attitude towards online shopping (George, 2002; Jarvenpaa, Tractinsky, & Vitale, 2000; Pavlou, 2003; Zhang & Zhang, 2005).

Lack of trust in online transactions (trust in the internet) can negatively influence e-government adoption decision (Carter & Belanger, 2005; Horst et al., 2007). Trust in e-government services can help citizens overcome perceived risks (Alsaghier, Ford, Nguyen, & Hexel, 2008), and in turn influence use intentions (Fu, Farn, & Chao, 2006). As a basic component of e-democracy, substantial amount of trust is required to facilitate e-voting adoption (Schaupp & Carter, 2005).

Two important components of trust is attributed to e-government adoption, thus trust in the government responsiveness and trust in the technology (Carter & Belanger, 2005; Carter & Weerakkody, 2008; Kozakova, 2011; Pavlou, 2003). Trust in the technology is an important factor influential to voters' intention to participate using e-voting system (Alomari et al., 2012; Carter & Belanger, 2012; Kozakova, 2011; Powell et al., 2012; Schaupp & Carter, 2005; Shareef et al., 2011). This is because, threats to e-voting security such as system hacking and eventual changing of voting results; malfunction of voting system, denial of service or submission of electronically altered results as a result of computer virus and risk of fake voting sites affect voter's perception of reliability of the e-voting to deliver (Belanger & Carter, 2010; Kozakova, 2011).

In his trajectory, Mäntymäki (2008, p 8) defined trust in e-government websites as "individuals' perception of the trustworthiness of the technology used in producing and delivering the governmental services". In another perspective, trust can also be defined as "the acceptance of the voting system after careful risk analysis" (de Jong, et al., 2008, p 400). The definitions can be categories into two broad parallels. The first perspective projects trust as a confirmatory product of thorough analysis of risk involved in using technology while the second considers trust as probable futuristic projection of predetermined positive respond of the technology. The implications may be that results of the studies on trust are bound to continuous to vary as the definitions of the concept varied.

Technology adoption researchers began to include trust construct as a factor influencing the intention to adopt complementary with the technological characteristics (Carter & Belanger, 2005; Carter & Weerakkody, 2008). Studies have recently identified trust in technology as one of the viable construct influencing technology acceptance. Trust in Technology is contingent upon citizen's belief that the technology is in-dependable medium capable of providing accurate and secured transaction (Powell et al., 2012). Security, privacy, accountability and economic feasibility are the basic components of trust in technology (Carter & Belanger, 2012).

Of all the above propositions, de Jong et al. (2008) argued that computer experts have tactically divert discussions about safety and security risks of voting technology to a level of technicalities that eventually cut off the public (voters) from understanding, let alone participate. The argument is backed with results of a comparative study between traditional paper voting ballot, Nedap voting machine with paper audit trial and without paper audit trial in Netherlands, which showed least favorable scores for voters' trust in the voting

machine. In a like view, the argument is further extended in a large election, in which the results indicated considerable fear that state can temper with election results in a seemingly subtle manner (Vladimirov, 2004).

Therefore, Dill, Schneier and Simons (2003) cast a serious doubt in the issue involving trust in the technology maintaining that it is ridiculous to ask people to trust technology manufacturers and designers at face value in a situation where voting machines work as de facto less transparent compare to paper ballots. However, despite problems and criticism of e-voting, the technology continue to gain acceptance in various societies (Fernandez et al, 2013; Wheaton, 2010) such as U.S.A. (Jefferson, Rubin, Simons, & Wagner, 2004; Yao & Murphy, 2007; Zetter, 2004); Brazil (Riebeek, 2002; Smith & Clark, 2005); and Netherlands (Pieters & Kiniry, 2005). The technology, in this case e-voting, is bound to evolve from strength to strength as long as innovations continue to be generated and studied (Roger, 2003).

b. Trust in Government Officials

Citizens-government trust is an important determinant of e-voting adoption. Designing technology to foster trust between citizens and public agency is one of the major responsibility of policy makers. The goal with which to achieve in designing online transactions is "to foster trust between constituents and institutions in the policy-making context" (Gano, 2013, p 255). Mayer, Davis and Schoorman (1995) defined trust as "the willingness of a party to be vulnerable to the actions of another party based on the

expectation that the other will perform a particular action important to the trust or, irrespective of the ability to monitor or control that other party".

The ultimate goal of adoption internet as innovative means of transaction is to attain high level of reputation by speeding up efficient, effective and transparence service delivery as well as get rid of rigidness, all of which trust in the government agency is a catalyst. Nonetheless, paucity of research on specific dimensions of trust and how they interrelate to each other is observed.

McKnight et al. (2002) pointed out that trust plays a central role in aiding perception of security and risk of technological system thereby determining ones intention to use. Furthermore, trust perception of the medium of transaction is critical and complementary to characteristics of the technology such as usefulness and ease of use in the process of forming decision to use technology. Drawing from the emerging model of reputation between online buyers and sellers such as Ebay, complex relationship between government organizations and citizens is mainly facilitated by trust (Gano, 2013). Extant literature has buttressed multidisciplinary and multi-dimensional use of trusting concept however, with limited coherency and articulation.

McKnight et al. (2002) stressed that beside trust in the technology, trust in institutional environment surrounding the technology affects behavioral intention to use the technology. Understanding the nature and antecedent of trust is therefore vital and an essential field of research. In their taxonomy of trust, McKnight et al. distinguished three basic dimensions of trust in institutional environment surrounding the technology. Thus, trust as "willingness to depend on a 'stakeholder' to deliver on commitment" also called trusting believe, trust

as a belief that the stakeholders uses clients data ethically, and trust as a perception that the internet is technologically secured (McKnight et al., p 335).

In connection with the above proposition, Carter and Belanger (2005) developed a model for e-government adoption where in trust in the technology and trust in government were integrated as important determinants of adoption. The model stressed the importance of trust in the technology and trust in the government agency as catalyst for adopting e-government initiatives, urging that trust is a significant factor that affects citizens' intention to use e-government services.

Similarly, Alomari et al. (2012) developed a theoretical model comprising constructs from DoI, web trust, social factors and the TAM to investigate main factors that influence intention to adopt e-government websites in Jordan. According to the study, trust in the internet; trust in government are important variables influencing intention to adopt e-government. Accordingly, provision of up-to-date information to citizens across various transaction of citizens in the process of dealing with government is an important ingredient capable of influencing trust in government. This bring to the fore, the imperativeness of improving e-government services infrastructure by making the e-government services citizen centric (rather than informative); ensuring collaborative legal framework and effective implementation strategies.

Pragmatic understanding of the nature and antecedent of trust through empiricism is vital and an essential in determining the behavior of clients. In essense, studying institutional-based trust is of great value to e-government initiative adoption such as e-voting.

3.5.4 Self-efficacy Theory

As part of the larger social cognitive theory, Bandura developed self-efficacy theory as a response to insufficient delve in the role of cognition in motivation and environment offered by the principles of behaviorism and psychoanalysis (Redmond, 2012). Embedded in Bandura's Triadic Reciprocal Determinism models, motivation and behavior is contingent on reciprocal interaction of cognitive, personal and environmental factors.

Bandura (1994, p 2) defined perceived self-efficacy as "people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives". He further posited that self-efficacy beliefs influences cognitive, motivational, affective, and selection processes in that it shape not only behavior but also determine how one feels, thinks and motivates himself. Two categories of people in relation to self-efficacy attributes are distinguished. People with strong self-efficacy approach difficult task as challenges to be mastered rather than threats to be avoided thereby enhance their life accomplishment. In contrast, people of weak self-efficacy consider difficult task as personal threat, dwell much on personal deficiencies, anticipated obstacles and adverse outcomes hence, they try to avoid them (Bandura, 1994).

This idea is extended by Hsu et al. (2008) who found that individual with high statistical software self-efficacy feels higher level of mastery of statistical software applications than the individual with low. Going by the pragmatic standpoint, Lee et al. (2011) and Chen et al. (2011) had identified two dimensions of self-efficacy namely individual self-efficacy (ISE) and assisted self-efficacy (ASE). Accordingly, individual self-efficacy entails a general inner convictions and enthusiastic impetus of one's ability without reference to any

form of external aid or guide. Assisted self-efficacy (ASE) on the other wing involves self-confidence through human and other forms of resources assisted self-efficacy such as computer, manual, past experience and availability of time.

The implication of these classifications set the boundary of self-efficacy to seem elastic and more dynamic setting ground for exploring other forms of self-efficacy such as linking relationship between political self-efficacy and political participation (Carter & Belanger, 2012; Hilmer, 2010). Supporting the idea, Lee et al. (2011) posited that static posture of efficacy is not as decisive as contained in the disposition of some researchers. Self-efficacy as a dynamic-based construct has long time cognitive effect to influencing ease of use, usefulness and eventually intention to use not necessarily at initial period of adoption rather through post adoption period. Lee et al. (2011) argued that belief structures comprising of ease of use, usefulness and intention to use are likely to increase with the increase of efficacious experience/mastery of the technology.

Furthermore, Bandura and Adams (1977) distinguished four main sources of information through which individuals judge their efficacy thus: a) performance accomplishments b) vicarious experiences of observing successful ones, c) verbal persuasion, and d) physiological feedback (emotional arousal). Accordingly, multi-layered approach is found more proficient to personal efficacy in that the more integrative the sources of information the greater, stronger and higher the self-efficacy changes produced.

As perceived self-efficacy remains an excellent predictor of performance with considerable accuracy, Bandura and Adams (1977) however, conclude that cognitive appraisal ability of individual to process, transform and integrate efficacy information is essential in

distinguishing efficacy outcome. They however, suggested that research should extend self-efficacy theory by exploring precise assessment of gradations in behavior.

With this offshoot of illumes, variance in the results related to self-efficacy may be affected by contextual differences of the potential adopters including technological differentiation which are often forgotten variables. Looking at it from technological deterministic viewpoint, Chen et al. (2009) argued that limit, scope and context of the technology under study have great impact in determining effect of self-efficacy on Perceived Ease of Use and Perceived Usefulness, TAM constructs.

Interrelationship of self-observation, self-evaluation, self-reaction and self-efficacy are the processes involve in goal realization and motivation in social cognitive theory. Self - efficacy is about what an individual believes he/she can achieve using self-endow experience and skills in a particular situation (Redmond, 2012). Motivation and performance is contingent on peoples' believe in their own selves. Appropriate utilization of sources of self-efficacy can improve employee's effort, persistence, goal setting, and performance on specific tasks. Research studies support the theory that an increased in self-efficacy influence individual perception of self-motivation and goal attainment (Redmond, 2012).

Self-efficacy theory has multidimensional value embedded in processes of shaping behavioral intention through cognitive, motivational, and affective domains, and enhances individual selection processes through shaping the behavior and determine ones feelings, thought and motivation drives (Bandura, 1994). Therefore, behavioral intention to

participate using e-voting system has much to be explored from perceived psychological competency of oneself in relation to the technology and the course of action.

a. Computer Self-efficacy (CSE)

Computer Self-efficacy can be refers as personal judgment of one's ability to use a computer technology (Compeau & Higgins, 1995; Scott, & Walczak, 2009; Teo, 2011). Redmond (2012) urges that self-efficacy is a universal phenomenon that provides ample suggestions applicable to any work setting including outside workforce. Self-efficacy has significant contributions to offer in that policy makers can tap from its resourcefulness. Motivation and performance is contingent on peoples' believe in their own selves. Appropriate utilization of sources of self-efficacy can improve employee's effort, persistence, goal setting, and performance on specific tasks. Research studies support the theory that an increased in self-efficacy influence individual perception of self-motivation and goal attainment (Redmond, 2012).

A view uphold by Ong, Lai and Wang (2004) and Park and Wentling (2007) was that e-learning experiences is helpful in decreasing computer anxiety, enhance computer skills, and improve learners' confidence of using computers. In a similar scenario, persons with a level of familiarity and experience in using computers have higher computer self-efficacy (Agarwal et al., 2000; Compeau & Higgins, 1995). Interrelatedness of self-observation, self-evaluation, self-reaction and self-efficacy are the processes involve in goal realization and motivation in social cognitive theory. Self -efficacy is about what an individual

believes he/she can achieve using self-endow experience and skills in a particular situation (Redmond, 2012).

Self-efficacy theory has multidimensional value embedded in processes of shaping behavioral intention through cognitive, motivational, and affective domains, and enhances individual selection processes through shaping the behavior and determine ones feelings, thought and motivation drives (Bandura, 1994). Individual perception on how one proficiently handles technical/technological intricacies of the technology has profound impact at all stages of technology adoption making self-efficacy theory a generic in virtually all technology adoption theories and models (Chen et al., 2011).

Bandura's (1989) self-efficacy theory provides ground for assessment of individual differences in relation to user perceptions about computer related technology and adoption decisions. Perceived self-efficacy determines the ability of the citizens to choose alternative course of action, require relative or absolute assessment of the amount of effort expend, endurance in the face of obstacles and adverse experience. Simply put, the stronger the self-efficacy the more enduring and affording ability and vice versa. Magnitude and strength are two major scales for measuring self-efficacy judgment. Self-efficacy magnitude involves measurement of difficulty levels such as easy, moderate and hard. The power of individual conviction to perform task of various difficulty levels is refers to as self-efficacy strength. Computer self-efficacy is an alternate variable to adoption intention of technology other than computer, therefore a proxy variable.

Compeau and Higgins (1995) explained that citizens with lower perception of computer self-efficacy could easily be irritated when facing difficulties in handling computer

technology. Such experience often stimulates low perception of one's capability to use and consequently convince oneself of anticipating more problems in the future, thus weakening intention to use technology. In contrast, citizens with a strong computer self-efficacy are not easily discouraged by encountering difficulties in using computer technology; instead, they endure and continue making effort hoping for eventual success, thus strengthening their intention to use technology (Compeau & Higgins, 1995).

3.6 Demographic Factors

Diffusion of e-voting system begins with the individual adoption as the most effective parameter to providing variance in the adoption rate. Demography such as age, gender, level of education, race, income, cultural background and belief system etc. is one of the factors that distinguish individuals' adoption rate thereby providing first-hand information to policy makers and industry on differential needs as well as sensitivity of various segment of the community. Past literatures have documented results of the influence of various demographic characteristics on intention to political participation for example, studies by (Lewis-Beck & Rice, 1992; Tolbert & McNeal, 2003; Uzoka & Ndzinge, 2009; Wolfinger & Rosen-stone, 1980) indicated influence of socioeconomic factors, particularly income and education on individual decisions to either or not to vote.

Digital divide is a barrier that distinguishes socio-demographic groups that are mainly distinct from one another on the bases of computer accessibility and use. As far as the digital divide argument is concerned, various characteristics of voters reflected in the availability of material, race, income, education and use proficiency seem to be particularly

important. Svensson and Leenes (2003) argued that unequal distribution of ICT among electorates as well as variation in the user proficiency could aggravate intensity of digital divides in voting across different socio-demographic background. And therefore, forceful adoption of electronic voting may have far reaching implications as it can lead to stigmatization of less technology savvy voters and luddites who often find it difficult to vote using the technology, thereby not only placing them at the disadvantaged position but also depriving their voting right.

Philips and von Spakovsky (2001) conceded the proposition pointing out that Arizona primary election in 2000 exacerbate digital divides as large urban counties with predominantly white voter populations voted via the internet in much greater numbers than their counterparts in rural counties with large populations of minority voters. Similarly, Uzoka and Ndzinge (2009) supported the idea that demographic characteristics of organization and individual is well recognized by DoI model as influential determinant to adoption decision and responsible for variation of rate of adoption. Demographic information such as the respondent's age, gender, education and income, use proficiency; type of organization, age of organization and size of organization can serve as potential moderating variables in DoI model (Uzoka & Ndzinge, 2009).

According to previous studies, there is strong anticipation that people living in urban cities are likely to have better exposure to voting innovation and in turn increase chances of their voting as compare to rural dwellers (Tolbert & McNeal, 2003). The proposition roll to motion, the argument of whether voting technology exacerbates the existing digital divides between rural and urban people.

Study by Yao and Murphy (2007) explored possible variation across socio-demographic characteristics of voters particularly sex and age groups in relation to remote electronic voting systems (REVS) adoption. The result of the study showed that privacy has significant impact on men's participation intention but not women. On the other hand, physical availability and ease of use have strong influence on women's participation intention, but not men. Further, old people are significantly less acceptance of REVS compare to younger. Giving the fascinating result, Yao and Murphy (2007) suggested for further exploration of voters' perception of REVS characteristics across several other demographic attributes such as race, education, income, and computer usage.

Similarly, Belanger and Carter (2010) investigated the impact of the digital divide on internet voting (I-voting) where a model of I-voting and the digital divide was developed. The model was meant to test variance in age, income, education and frequency of internet use on intention to use e-voting. The digital divide model accounts for 8% of the variance in intentions to use I-voting. Specifically, results of the study indicate that age and income are significant determinants of I-voting intentions, meaning that younger citizens are likely to possess the computer skills necessary to use internet voting while individuals with higher income levels are more likely to have access to the technology, hence the two are likely to take advantage of the use of internet voting.

Based on the model of Belanger and Carter, education did not have a significant impact on adoption intention, which might be due to non-significant variance in the education of the study sample. However, it was suggested that future studies should continue to explore the effects of education on the digital divide. In addition, frequency of internet use was not found to have significant impact on intention. The non-significance result of frequency of

internet use may be affected by other exogenous factors such as internet trust and internet self-efficacy; hence it was recommended that future studies should explore the impact of internet trust and internet self-efficacy characteristics of digital divide on I-voting acceptance. The result is an indication that demographic barriers pose serious challenge of digital divide for various government technological initiative/drive, e-voting inclusive.

3.7 Hypothesis Development

Given the highlights on the background of the major constructs of the study set in for hypotheses formulation. With the help of literature, hypotheses for this study have been formulated on the relationship between the independent variables (IVs) and the dependent variable (DV). In addition, potential interactive effect of mediating variables in the relationships between some independent variables and the dependent variable were hypothesized.

This study has seven constructs as the independent variables namely perceived trialability, perceived observability, perceived ability to use, trust in the technology, trust in the electoral government officials, trust in politically elected government officials and computer self-efficacy; a mediating variable, perceived relative advantage whereas intention to participate in elections using e-voting system is the dependent variable. Thirteen hypotheses were formulated for empirical testing and validation.

3.7.1 Perceived Trialability (TRB) and Voters' Intention to Adopt e-Voting System

Trialability is defined as "the degree to which an innovation may be experimented with on a limited basis" (Inman, 2000, p 52). It also defined as the extent to which an innovation can be experimented with on a limited basis (Cao & Mokhtarian, 2005, p 7). The more the technology is permitted to experiment the easier and quicker the rate of its adoption (Park & Chen, 2007). Empirical findings from cross section of previous studies found no significance relation between trialability and attitude (Park & Chen, 2007). Other studies showed weak relation between trialability and intention to adopt (He, Duan, Fu, & Li, 2006). The results suggested that trialability is less relevant in adoption decision compare with observability.

In contrast, Tobbin and Kuwornu (2011) found that trialability is a key predictor of customers' intention to adopt mobile money. Similarly, in a model that integrated TAM, attitude and characteristics of innovation comprising of trialability and observability, Rezaei-Moghaddam and Salehi (2010) found that trialability positively affects intention to adopt agricultural technologies. The results showed that trialability has significant effect on perceived ease of use, attitude and intention to extension. There is overwhelming support of previous studies in which trialability of innovation is found to be positively related to rate of adoption (Cao & Mokhtarian, 2005; Rezaei-Moghaddam & Salehi, 2010; Rogers, 1983). Notwithstanding a sizeable number of research studies that examined the effect of trialability on intention to adopt variety of technological innovation, rarely the constructs is examined in the field of e-voting adoption. In line with research question one, we therefore proposed, thus:

H_1 Perceived Trialability of e-voting system (TRB) positively influences voters' intention to adopt the system.

3.7.2 Perceived Observability (OBS) and Voters' Intention to Adopt e-Voting System

Interestingly, some research studies contemplate that perceived observability is more important in directly predicting intention to participate variance than perceived trialability (Salehi, Hayati, Karbalaee, & Chin, 2012; Adhiutama, 2011). In rare circumstances, perceived trialability was reported as important predictor of attitude to use and not OBS (Chen et al., 2009). More so, strong correlations between perceived trialability and perceived observability were reported (Adhiutama, 2011) suggesting that perceived observability and perceived trialability have complementarity functions. Notwithstanding, simultaneous antecedents of the duo in research studies, they often have different predictive capacity to adoption intention.

Finding of Chen et al. (2009) showed that observability does not have effect on attitude. Conforming to this finding, Sang et al. (2009) argued that trialability and observability have no strong correlation with adoption intention. On the other lane, literature has reported significant indirect positive effect of observability on the intention to adopt. Perceived observability was found having significant positive impact on user's attitude toward using smartphone portraying the more visible the smartphone is, the more likely influence the attitude of the user toward using it (Park & Chen, 2007). Perceived observability was reported to have significant positive correlation with TAM variables, Perceived Usefulness and Perceived Ease of Use (as mediating variables) while perceived trialability has significant positive correlation with Perceived Ease of Use and not Perceived Usefulness

(Rezaei-Moghaddam, & Salehi, 2010). In line with research question one of this study, we therefore conjecture that:

H_2 Perceived Observability of e-voting system (OBS) positively influences voters' intention to adopt the system.

3.7.3 Perceived Ability to Use (PATU) and Voters' Intention to Adopt e-Voting System

Complexity in DoI with Perceived Ease of Use in TAM demonstrated level of similarities with inverse functions. Considering the vital role of the perceived complexity and Perceived Ease of Use to studying perception of potential technology adopter and their generic essence, Shareef et al. (2011) integrated the variables and renamed perceived ability to use.

In a study that investigated predictors of e-government adoption, Shareef et al. (2011) found significant causal relations between perceived ability to use and e-government adoption at static level and at interactive phase. In fact, perceived ability to use is found to have been the most contributing predictor of e-government adoption at the interaction stage. Shareef et al. (2011, p 25) concluded, "Perceived Ability to Use, which captures the integrated view of Perceived Ease of Use of TAM and the complexity and compatibility of DoI, and PFB, which captures the overlapping essences of Perceived Usefulness of TAM and the relative advantage of DoI, are the critical factors for the adoption of e-Gov". The need to study the influence of perceived ability to use on intention to participate using e-voting system is suggested (Carter & Belanger, 2012; Carter & Campbell, 2011; Igbaria &

Iivari, 1995; Powell et al., 2012; Schaupp & Carter, 2005; Shareef et al., 2011). In tandem with research question one, this study proposed that

H_3 Perceived Ability to Use (PATU) positively influences voters' intention to adopt e-voting system.

3.7.4 Trust in the Technology (TIT) and Voters' Intention to Adopt e-Voting System

While e-voting presents potential solutions to some obvious defect of paper ballot system, some risks associated with e-voting include program error, threat of system hacking and eventual changing of voting results, denial of service or submission of electronically altered results as a result of computer virus such as Trojan horse, software attack, and risk of fake voting sites (Kozakova, 2011). Significant number of literature indicated that trust in technology is positively related to use intention, meaning, the greater the trust in the technology the higher the intention to use, and as such, trust is a predictor of intention to use (Carter & Belanger, 2012; Fu et al., 2006; Powell et al., 2012; Shareef et al., 2011; Sheng, Wang, & Yu, 2011). Lack of trust in the internet has been one of the most frequently cited obstacle preventing consumers from engaging in online transaction (Matthew, Lee, & Turban, 2001).

Study by Schaupp and Carter (2005) found that trust in internet has significant impact on intention to use e-voting system. Corroborating with the finding, a study by Belanger and Carter (2010) showed a higher level of correlation between trust in the internet and intention to use an I-voting system. The result is an indication that fears of incorrect voting or misuse of voting machine out of anxiety is correlated with the intention to use e-voting

system. Lack of trust is considered a major barrier to adoption of innovation (Carter & Weerakkody, 2008) therefore; an essential research constructs influencing the intention to continue using technology directly or indirectly (Karavasilis et al., 2010).

Similarly, results of empirical survey conducted on factors affecting intention to adopt e-government at different stages of service maturity in Canada indicated that trust in technology is a significant positive predictor of intention to adopt e-government services at interactive stage (Shareef et al., 2011). Substantiating significant positive relationship between trust in the technology and behavioral intention, Teo, Srivastava, and Jiang's (2008) finding demonstrated trust in technology as predictor of trust in e-government web sites for active users.

However, the result of the impact of trust in technology on the intention to use is inconclusive. While findings of Carter and Belanger (2012), Kozakova (2011), Powell et al. (2012), Schaupp and Carter (2005); and Shareef et al. (2011) indicated positive relationship between trust in technology and intention to use, the findings are however in contrast to the studies by Alomari et al. (2012), Carter and Belanger (2004), and Zafiropoulos et al. (2012) who found non-significant relationship between trust in the technology and intention to use e-government website. The findings portrayed trust as weak predictor of intention to use compared to other cognitive factors, intrinsic characteristics, and operational variables of innovation.

The inconsistent findings suggest that evaluating citizens' trust in technology in relation to intention to use continue to be the focus of many research studies, this one inclusive. In which case, this study intends to examine influence of citizens' trust in technology on the

intention to use e-voting system in Nigerian context and in the quest for consistent results (Baron & Kenny, 1986). This is especially considering the need for theory-oriented empirical studies on the nature and antecedents of trust in the specific context of internet-based transactions (Matthew, Lee, & Turban, 2001). In conformity to research question one of this study, we hypothesized thus,

H_4 Trust in the Technology (TIT) positively influences voters' intention to adopt e-voting system.

3.7.5 Trust in Government Officials and Voters' Intention to Adopt e-Voting System

Closely similar with inconsistent results trailing trust in the technology, inconsistency are the results of the findings about the effect of trust in the government officials on intention to adopt e-government initiatives. For instance, using multiple regression analysis, a study conducted by Alomari et al. (2012) indicated that trust in government was significant predictors of intention to use e-government websites in Jordan, depicting that the higher the levels of trust in government the increase levels of user adoption of e-government websites. Similarly, in their study, Schaupp and Carter (2005) revealed that trust in government has direct effect on intention to use e-voting system. In the same vain, study by Teo et al. (2008) demonstrated that trust in government is positively related to trust in e-government Web sites, which in turn is positively related to information quality, system quality, and service quality. Moreover, Carter and Belanger (2012) found significant positive relationship between trust in government officials and intention to use I-voting.

Contrary to expectation, given the high levels of dissatisfaction, suspicion, and antipathy that seem to fill general discourse in society regarding the ways that government functions, empirical survey conducted by Cater and Belanger (2004) and Powell et al. (2012) found non-significant influence of citizens' trust in the government on online voting intentions. Although it has been plausibly explained that the findings seem to have power effect as causal relationship may exist but failed to be established, inability of research studies to draw distinctive line between trust on politically elected government officials and trust on bureaucratic electoral officials especially in societies that consider the two differently cannot be ruled out. Hence, the indication that the measurement is bound to have compounding error. The study therefore recommended accurate measure of trust between politically elected officials and bureaucratic electoral officials. Perhaps by providing a clearer definition of the type of trust being measured by a survey instrument. In line with research question one, we proposed, thus

H_5 Trust in the Electoral Government Officials (TEO) positively influences voters' intention to adopt e-voting system.

H_6 Trust in in politically elected government officials (TPO) positively influences voters' intention to adopt e-voting system.

3.7.6 Computer Self-efficacy (CSE) and Voters' Intention to Adopt e-Voting System

According to Venkatesh and Davis's findings, computer self-efficacy is the important determinants of perceived ease of use. Empirically, computer self-efficacy was found to have direct influence on the intention to use technology (Teo, 2009a). In training

environment, computer self-efficacy is also an important trainee characteristic for e-learning situations (Chau & Wang, 2000). Lim et al. (2007) also found that self-efficacy has a positive impact on learning achievement of e-learning. Similarly, in their study, Hauser, Paul and Bradley (2012) revealed that general computer self-efficacy was positively correlated with specific computer self-efficacy, and in turn positively correlated with performance.

A study that investigated the influence of computer self-efficacy, anxiety and attitudes towards use of technology in Nigeria, Oye, A.Iahad and Ab.Rahim (2012) found significant positive influence of self-efficacy on the acceptance and use of the technology by the academics staff of the University of Port Harcourt. The above proposition suggests that general efficacy measure is a predictor of intentions to use to a wide range of technologically advanced products (Mathieson, 1991). Torkzadeh, Pflughoeft and Hall (1999) pointed out that computer courses have significantly positive influences on increasing computer self-efficacy.

In contrast, a study that compared adoption constructs for e-government diffusion, computer self-efficacy was not significant predictor of intention to adopt (Carter, 2008). "Perhaps computer self-efficacy has an impact on use intentions, but it is not one of the dominant predictors" (Carter, 2008, p 156). The inconsequential results of computer self-efficacy as predictor of intention to use may be influenced by the strong influence of the other adoption variables in the study (Carter, 2008). In addition, investigating general communication tool or specific usage of the technology warrants for variance in the results of self-efficacy in relation to other constructs.

In a study that combined TAM, DoI and self-efficacy, self-efficacy was found to have marginal effect on behavioral intention and a strong antecedent of Perceived Ease of Use in the TAM model (Chen et al., 2009). As an antecedent and through Perceived Ease of Use, self-efficacy influenced Perceived Usefulness. Moreover, in a model that combined TAM and DoI constructs, self-efficacy strongly affects intention to use than it does in TAM model alone (Chen et al., 2009). Results of the study by Chien, 2012 revealed that computer self-efficacy has positive moderating effects in the correlation between system functionality and employee training effectiveness. Thus, employees with high computer self-efficacy are more effective than for those with low computer self-efficacy.

It can be deduced that direct impact of computer self-efficacy has been tested on intention to use in other context of technology adoption studies (Carter, 2008; Chien, 2012; Chuo et al., 2011; Hauser, Paul, & Bradley, 2012; Oye, A.Iahad, & Ab.Rahim, 2012; Shareef et al., 2011). In addition, self-efficacy were used as an antecedent of perceived usefulness (Scott & Walczak, 2009) and perceived ease of use (Chen et al., 2009; Park & Chen, 2007; Punnoose, 2012). The need to examine the impact of computer self-efficacy as predictor of intention to use e-voting system is equally suggested (Carter & Belanger, 2012; Carter & Campbell, 2011; Powell et al., 2012; Schaupp & Carter, 2005). In line with research question one, this study therefore conjunct that

H_7 Computer Self-efficacy (CSE) positively influences voters' intention to adopt e-voting system.

3.7.7 Empirical Association between the Independent Variables (TRB, OBS, TIT, CSE and PATU), Mediator (RA) and the Dependent Variable (ITP)

Some literature reported that increase in perceived relative advantage of the voter does not influence intentions to use e-voting (Belanger & Carter, 2010; Schaupp & Carter, 2005). However, predominant literature reported positive relationship between relative advantage and intention to adopt. For example, Carter and Belanger (2012) and Carter and Campbell (2011) found significant impact of relative advantage on intention to use I-voting. The results indicated that the more the potential adopter perceived benefits of a technology, e-voting in this case over the existing traditional paper ballot system the more likely the intention to adopt. Similarly, in a study by Carter and Belanger (2012) intention to use I-voting is influenced by relative advantage in that the more citizens perceived comparative benefits of the innovative system of election over the present practices the increased intention to adopt. Relative advantage was found to have direct effect on intention to adopt e-government services (Zafiropoulos, Karavasilis, & Vrana, 2012).

Furthermore, Sang, Lee and Lee (2010) study demonstrated positive significance influence of relative advantage on intention to use government administration information system (GAIS) in a way, higher levels of perceived relative advantage are associated with increased user acceptance of the GAIS (Sang, Lee, & Lee, 2010). Davis' (1989) perceived usefulness, a theoretical substitute for relative advantage concept developed by adoption theory (Chen et al., 2002) was found to have positive influence on attitude towards internet use for online shopping. Perceived usefulness variable is therefore a determinant of attitude towards internet use as an e-commerce tool (Zarrad & Debabi, 2012).

Statistically, perceived relative advantage is consistently one of the three most commonly significant attributes of technology determining intention variance to use a wide range of technological innovations (Benbasat & Barki, 2007; Gefen & Straub, 2000; He, Duan, Fu, & Li, 2006; Schaupp & Carter, 2005; Wu & Wang, 2005; Yi, Jackson, Park, & Probst, 2006; Zafiropoulos, Karavasilis, & Vrana, 2012), and across various participants (Carter & Belanger, 2012; Lee, 2007; Shih, 2007). However, the construct is rarely tested in relation to voter cognitive decision to participate using e-voting system.

Equally important, technology adoption scholars have examined interrelationship among the major constructs of TAM in which perceived usefulness is found to have strong predictive power on intentions to use-whereas perceived ease of use is secondary and acts through perceived usefulness (Davis, 1998; Davis, Bagozzi, Warshaw, 1989; Igbaria, Zinatelli, Cragg, & Cavaye, 1997).

Moreover, Rezaei-Moghaddam and Salehi (2010) and Salehi, Hayati, Karbalaee and Chin (2012) hypothesized that trialability and observability have relationship with intention to adopt precision agricultural technology through both perceived usefulness and perceived ease of use (mediators). In another word, Perceived Usefulness and Perceived Ease of Use mediate the relationship between perceived trialability and intention to participate; and perceived observability and intention to participate. The results of Rezaei-Moghaddam and Salehi study showed significant positive mediation effect of perceived ease of use in the relationship between perceived trialability and intention to participate and perceived observability and intention to participate while perceived usefulness mediate the relationship between perceived observability and intention to participate.

Additionally, a stream of the literature revealed mediating relationship between DoI constructs and TAM constructs. For instance, findings of semi meta-analysis by Legrisa, Inghamb and Collerettec (2003) showed that Perceived Usefulness mediates the relationship between result demonstrability and intention to use. Also hypothesized and validated were mediating effect of attitude in the relationships between trialability, observability and behavioral intention to adopt (Chen et al., 2009; Park & Chen, 2007), supporting the proposition that TRI and perceived observability influence citizen's intention to adopt through indirect effect of attitude.

Given the mediating effect of perceived usefulness and perceived ease of use to a wide range of adoption variables (Chen et al., 2009; Hsia & Yang, 2011; Hsu, Wang & Chiu, 2008; Park & Chen, 2007), as well as the incontrovertible similarity of perceived relative advantage and complexity constructs of DoI with perceived usefulness and perceived ease of use constructs of TAM in the literature (Shareef et al., 2011), the permutation implicitly suggests potential mediation of perceived relative advantage in the relationship between technology attributes and other adoption variables. In contrast to TAM constructs, innovation diffusion scholars rarely explore correlation between and among the major DoI constructs. Not until recently, the literature has begun to explore the mediating role of perceived relative advantage in the relationships between some DoI variables and intention to use. For instance, Wu and Wu (2005) investigated the mediating role of relative advantage between perceived compatibility, perceived complexity and behavioral intention. The results of the study found high correlation between compatibility and relative advantage, which is clear indication of a causal relationship between them.

The framework was then modified and relationship between compatibility and relative advantage was statistically tested and confirmed. In addition, complexity was found to have significant impact on relative advantage, which in turn significantly influences the attitude. Thus, complexity is an indirect predictor of attitude through perceived relative advantage as mediator. Wu and Wu (2005) concluded that adoption of e-CRM is predicted by the perceived usefulness of the user and not perceived ease of use perhaps because of the user friendliness nature of user interface that makes learning for application systems much easier than in the past. Wu and Wu (2005) found that complexity has significant impact on relative advantage, which in turn significantly influences the attitude. Thus, complexity (a surrogate of perceived ability to use) is an indirect predictor of attitude through perceived relative advantage as mediator. The argument provides clue on potential mediating effect of relative advantage in the relationship between perceived ability to use and adoption intention.

Similarly, Carter and Campbell (2011) examined the mediating effect of relative advantage in the relationship between accessibility and intention to use internet voting. The results of the study confirmed mediating role of perceived relative advantage in the relationship between accessibility and intention to use internet voting. Relatedly, in a model of internet voting and political participation, Carter and Belanger (2012) explored the mediating effect of relative advantage in the relationship between convenience and intention to use I-voting. The results of the study revealed that accessibility influences convenience, which serves as an antecedent to perceived relative advantage, and relative advantage influences intention to use I-voting system. In essence, relative advantage mediates the relationship between

convenience (which has accessibility as antecedent) and intention to use internet-voting system.

Findings of Hsu et al. (2008) showed that individual with high statistical software self-efficacy feels higher level of mastery of statistical software applications than the individual with low mastery of statistical software applications. The study found that both statistical software self-efficacy and computer attitude lead to positively significant influence on perceived usefulness (PU), a surrogate of perceived relative advantage of DoI. However, both the two external variables of statistical software self-efficacy and computer attitude did not have significant influence on perceived ease of use. In their studies, Lee et al. (2011) and Chen et al. (2011) found that both individual and assisted self-efficacy are predictors of behavioral intention and Perceived Ease of Use however, only assisted self-efficacy is found strong antecedent for perceived usefulness. Meaning, self-efficacy has significant influence on Perceived Ease of Use, while it only partially affects Perceived Usefulness.

Accordingly, investigating general communication tool or specific usage of the technology warrants for variance in the results of self-efficacy in relation to other constructs. In a model using TAM, Self-efficacy was found to have marginal effect on behavioral intention and a strong antecedent of Perceived Ease of Use. As an antecedent of perceived ease of use, self-efficacy influences perceived usefulness. In a model that combined TAM and DoI constructs, self-efficacy strongly affects intention to use than it does in TAM model alone.

Furthermore, computer self-efficacy was also found to be a significant predictor of perceived usefulness (Teo, 2011). Meaning, potential user with high level of computer self-efficacy tends to appreciate any difficulties faced in the course of using computer

technology and treat them as potential challenges capable of adding productivity and value (perceived usefulness) towards a task (Teo, 2011). Also hypothesized and validated were mediating effect of attitude in the relationships between self-efficacy and behavioral intention to adopt (Chen et al., 2009; Park & Chen, 2007). According to the study by Chen et al. (2009), Self-efficacy influences perceived ease of use and in turn affects behavioral intention to use smart phone. Succinctly put, self-efficacy was a strong antecedent of perceived ease of use.

The idea is an indication that behavioral intention to use innovative practices in this case e-voting system has much to be explored from perceived psychological competency of oneself in relation to the technology and the course of action (Bandura & Adams, 1977). The need to analyze the impact of computer self-efficacy on intention to participate in elections using e-voting system is equally suggested (Carter & Belanger, 2012; Carter & Campbell, 2011; Powell et al., 2012; Schaupp & Carter, 2005). However, given our initiate proposition that a voter cognitive decision to participate would be influenced if he/she perceived appealing technological attributes of e-voting system as capable of reducing the costs of voting, we therefore, find it interesting to conjure mediating role of perceived relative advantage of e-voting in the relationship between computer self-efficacy and intention to participate in election.

Keeping in mind the imperative of combining DoI constructs with application research constructs, more significantly is testing mediating effect of perceived relative advantage of e-voting as predictor of intention to participate in election. This study therefore proposes to examine the mediating role of perceived relative advantage in the relationships between perceived trialability, perceived observability, perceived ability to use, trust in the

technology, computer self-efficacy and intention to participate in election. This is in order to answer research question two.

H_8 Perceived trialability of e-voting system (TRB) has significant impact on voter perception of relative advantage of e-voting system (RA).

H_9 Perceived observability of e-voting system (OBS) has significant impact on voter perception of relative advantage of e-voting system (RA).

H_{10} Perceived ability to use (PATU) has significant impact on voter perception of relative advantage of e-voting system (RA).

H_{11} Trust in technology (TIT) has significant impact on voter perception of relative advantage of e-voting system (RA).

H_{12} Computer self-efficacy (CSE) has significant impact on voter perception of relative advantage of e-voting system (RA).

H_{13} Perceived relative advantage (RA) of e-voting system has significant positive impact on voter's intention to participate in elections using the system (ITP).

H_{14} Perceived Relative Advantage (RA) of e-voting system mediates the relationship between perceived trialability (TRB) and voter's intention to participate in elections using e-voting system (ITP).

H_{15} Perceived relative advantage (RA) of e-voting system mediates the relationship between perceived observability (OBS) and voter's intention to participate in elections using e-voting system (ITP).

H_{16} Perceived relative advantage (RA) of e-voting system mediates the relationship between perceived ability to use (PATU) and voter's intention to participate in elections using e-voting system (ITP).

H_{17} Perceived relative advantage (RA) of e-voting system mediates the relationship between trust in the technology (TIT) and voter's intention to participate in elections using e-voting system (ITP).

H_{18} Perceived relative advantage (RA) of e-voting system mediates the relationship between computer self-efficacy (CSE) and voter's intention to participate in elections using e-voting system (ITP).

3.8 Summary

Presented in this chapter, review of literature concerning overviews of broader field of e-government within which e-voting is placed. Also reviewed, literatures on the underpinning theory including supportive, which scaled down to major constructs of the study. In line with quantitative aspect of the study, seven (7) and thirteen (13) hypotheses were formulated for research question one and two respectively. The literature review section ushered in the methodological design.

CHAPTER FOUR

METHODOLOGY

4.1 Introduction

The chapter focused on the overall research design that accounts for step-by-step procedure of scientific inquiry premising this study. In the first place, the chapter highlighted on the convergent parallel methodological design that combined quantitative and qualitative approach to data collection and analysis. Process of selection and justification for the research method follows. The chapter is broadly divided into two parts namely; quantitative research design and qualitative research design. The first part discussed the population and sample design; data collection technique and data analysis. The second part consists of qualitative research design that highlighted on face-to-face interviews, content analysis technique, potential ethical issues, and results of qualitative pilot study.

4.2 Research Design

This study adopts quantitative reaserch technique, being major and supported by qualitative technique in what seems a mixed method design. In the context of information system, phenomena are socially inclined rather than absolutely deterministic. Therefore, neither a purely quantitative nor a purely qualitative method of research always provide rich insights, or address the issue of generalization (Venkatesh, Brown, & Bala, 2013). Mixed research method is therefore, the most suitable content-analytic approach (Weber, 1990).

Below is a tabular representation of research questions and corrosponding research methods.

Table 4.1

Research Question and Corresponding Research Design

No	Research Question	Research Approach
1	What are the technological attributes, socio-psychological factors and political trust that influence voters' adoption of e-voting system as determinants of voting participation?	Quantitative approach
2	How technological attributes, socio-psychological factors, and institutional trust influence voting participation?	
3	What are the factors with potential implications of imposing decrease in voter turnout in a drive to adopt e-voting system in Nigeria?	Qualitative approach
4	How to solve problems of decreasing voter tunout in a drive to adopt e-voting system in Nigeria?	

Depicted in Table 4.1 above distinctive research approaches adopted to investigate the four research questions initially developed for this study. Both quantitative and qualitative data for the study were collected simultaneously using survey and face-to-face interview techniques respectively.

4.2.1 Convergent Parallel Design

This study adopts the use of convergent parallel design that allows for simultaneous collection of both quantitative and qualitative data, analyze the datasets independently, relate the results from the analysis of both datasets, and interpret as to whether the results

support or refute each other. The design also enables us to use combined results obtained from distinct data sources to understand our research problems and objectives. The analysis of the two sets of the data was carried out independently. However, the two set of the data were discussed togather and in some instances seprate given the nature of information, research questions and objectives.

The rationale behind selection of the design is to optimize the strength of one form of data to offset the weaknesses of the other form. Accordingly, quantitative and qualitative data were collected separately in two parallel phases for the two sources of data. The reason is to enhance, elaborate, and complement each other as depicts in the Figure 3.2 below:

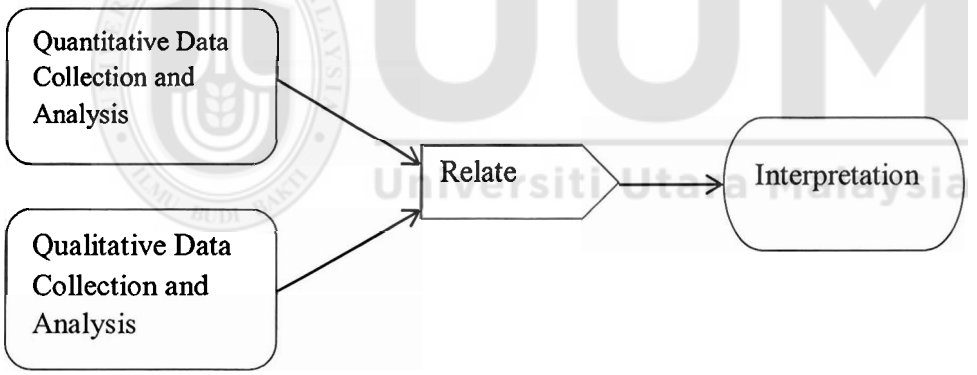

Figure 3.2. Convergent parallel design
Sources: Creswell (2012)

Selection of Convergent Parallel Methodological Design is based on the following reasons:

1. Newness of the e-voting system adoption research in Nigerian context especially in relation to voters' turnout and the need to test relevant theories using sample from Nigeria to address the problems.

ii. The need for the study to provide rich and complex yet comprehensive picture as well as different perspectives of participation in elections using e-voting system.

iii. The study's questions and objectives required integration of broad numerical strength of the quantitative and the details of qualitative data to obtain more in-depth and specific information on how e-voting system adoption influences voters' turnout.

iv. The need to develop and test the quantitative instrument with exploration of participants' views.

v. The need to generalize the findings to a population and to develop a detailed view of the meaning of a phenomenon and concept under study.

vi. The need to hear the voice and views of the major stakeholders, especially the electorates (outside the preconceived or bounded restriction of quantitative variables).

vii. The need to have better understanding of the research problem and research question than either of the methods alone.

4.3 Quantitative Research Design

This section provides highlight on step-by-step process of data collection and analysis of quantitative data. The areas highlighted under this section include population and sample; sample size and sampling technique; instrumentation; and data collection procedure and data analysis.

4.3.1 Population of the Study

Using simple probability sampling technique, northeast zone comprising of Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe States was selected as the population of this study. Therefore, our population of the study consist total number of registered voters in northeast. Inability of the researcher to access accurate identity and addresses of individual adults, constituting population of the study pose serious challenge to delineate sampling frame. Alternatively, the research adopts registered voters from the voters' population census of persons of 18 years and older as sampling frame. Table 4.2 below represents distribution of registered voters according to States.

Table 4.2

Number of Registered Voters as at 2011

Geopolitical Zones	**States**	**Registered voters**
North-East	Adamawa	1,816,094
	Bauchi	2,523,614
	Borno	2,380,957
	Gombe	1,318,377
	Taraba	1,336,221
	Yobe	1,373,796
Total	**6**	**10,749,059**

Sources: INEC (2012)

Table 4.2 above depicts registered voters according to the States of the Northeast Geopolitical Zone that constitutes the population of this study. Out of the total of 73, 528, 040 registered voters in Nigeria as at 2011, Northeast Geopolitical Zone has 10,749, 059 constituting 14.62% (INEC, 2012).

4.3.2 Sample Size and Sampling Technique

The sample of size of this study is determined using Dillman (2007) formulas. The study adopts a confident level of 95% and margin error (confidence interval) of ±5 as follows:

$$Ns\ \frac{(NP)(P)(1-P)}{(NP-1)\left(\frac{B}{C}\right)^2+(P)(1-P)}$$

Where:

Ns = ?

Np = 42, 180, 236

P = 0.5

B = 0.05

C = 1.96

$$\text{Ns}\ \frac{42{,}180{,}238\ X\ 0.5\ X\ (1-0.5)}{(42{,}180{,}238-1)\left(\frac{0.05}{1.96}\right)^2+\ (0.5)(1-0.5)}$$

$$\frac{42{,}180{,}238\ X\ 0.25}{42{,}180{,}237\ X\ 0.00065+0.25}$$

$$\frac{10{,}545{,}059.5}{27{,}417.45}$$

$$\text{Ns} = 384.61$$

The sample size is approximately 385, which is in conformity with the rule of thumb for a sample size of population size from 1,000, 000 up to 1, 000, 000, 000 according to Krejcie and Morgan's (1970) simplified tables. Similarly, Dillman (2007) urged that at a point when the population size get into tens of thousands, differences in the sample size do not

determine level of precision. However, in order to avoid potential non-response problem and sample size error; as well as to increase the level of precision and potential generalizability, the sample is increased to five hundreds (Hair, Wolfinbarger, Ortinau, & Bush, 2009; Hair, Bush, & Ortinau, 2003).

To explore variability in the population, the study adopted stratified sampling technique. At first stage, the five hundred survey were distributed proportionately according to the number of registered voters within State strata as shown in the Table 4.3.

Table 4.3

Proportionate Distribution of Questionnaire

States	**No of registered Voters as at 2011**	**% (n)**	**Proportionate Distribution of Questionnaire ($^{n}/_{100}$x500)**
Bauchi	2,523,614	48.7	243
Gombe	1,318,377	25.5	128
Taraba	1,336,221	25.8	129
Total	**5,178,212**	**100**	**500**

Table 4.3 above has shown registered voters per State, and proportionate distribution according to the sample size of each State. Given the challenge of accessing records of identities and addresses of registered voters' according to household, the researcher liaised and obtained lists of available districts, ward and housing units from the Nigerian Postal Service and Housing Development Authorities of the selected States. Using the lists, the States were stratified into Local Government, district/villages, wards and housing units and random selection were adopted at each level.

4.4 Instrumentation

As an important aspects of quantitative study, measurement of constructs and dimensions for this study is based on operational definition (operationalization), and available measurements within the related literature. It involves systematic description of important property of a phenomenon of interest by assigning valid and reliable numbers (Zikmund, et al., 2009). All scales measurements will then be exposed to reliability and validity test (Sekaran & Bougie, 2009).

4.4.1 Operationalization of Constructs

This section provides operational definitions of major constructs of the study comprising of participation intention, relative advantage, trialability, observability, perceived ability to use, trust in the technology, trust in the government officials and computer self-efficacy as presented in Table 4.4.

Table 4.4

Operationalization of Constructs

Constructs	Operational Definition	Sources
Participation intention	The degree of the voter's intention to participate in a public election using voting technology	Yao and Murphy (2007)
Perceived Relative Advantage	The degree to which a technology is perceived as having more benefits than the existing practice	Carter and Belanger (2012), Gutowska (2007)
Perceived Trialability	The degree to which the technological innovation can be experimented with on a limited basis before adoption	Carter and Bélanger (2005)
Perceived Observability	The degree to which the results of an innovation are visible and observable to others.	Rogers (1983), Moore and Benbasat (1991)
Perceived Ability to Use	The degree to which a user perceives his/her competence and comfortable ability for using of government initiative technologically, organizationally, and psychologically that match with individual's values, social needs, and overall attitudes	Shareef et al. (2011)
Trust in the Technology	Citizens' belief that the internet is a dependable medium capable of providing accurate information and secure transactions	Carter and Belanger (2012).
Trusting beliefs	The confident truster perception that the trustee —in this context, 'government officials' has attributes that are beneficial to the truster.	McKnight et al. (2002, p 337)
Computer Self-efficacy	The extent to which a citizen is confident in his/her ability to operate computer related technology empowers him/her to interact with e-voting system. Computer self-efficacy is also refers to citizens' judgment of their capabilities to use computers in diverse circumstances	Compeau and Higgins (1995).

4.4.2 Measurement of Study Constructs

To measure the major construct of the study, the researcher reviewed existing literature extensively and came up with survey instruments using multiple-items. Accordingly, all the items in the survey were adapted from the existing measures validated by other researchers in I-voting adoption, e-government adoption and other sundry technology adoption to suit the content and context of this study. A Table displaying items adapted to measure major constructs of the study and their sources is annexed at Appendix A. Nonetheless, previous studies indicated high scores for reliability and validity of the measuring items, in this study we have subjected the items to various ladders of reliability and validity test and found to have fulfilled the requirements to measure the intended constructs. Be it as important, indicative in the table, we avoided mixing negatively and positively worded statements in order to avert potential confusion and frustration on the part of respondents. As practice of mixing negatively and positively worded statements can hamper the accuracy, quantity and quality of the data (Churchill, 1979; Likert, 1932).

4.4.3 Five (5) Points Likert Scale

This study adopted five points Likert scale instead of the original seven-point scale. The five points scale Likert response as a format of collecting interval data has a range from strongly agree represented by '5' to strongly disagree represented by '1'. The scale is selected in order to ensure adequate sensitivity in distinguishing individuals based on variables of interest (Sekaran & Bougie, 2009). It has the required sensitivity to properly examine changes in hypothetical constructs under investigation.

Additionally, the selection of five-likert scale was based on numerous advantages of the scale over other scales. The scale is reported to have been the most effectively used in behavioral science and technology adoption researches with more favorable response (Babakus & Mangold, 1992; Peter, 1979). It also increases quality and rate of response as well as minimize the respondent's frustration level (Babakus & Mangold, 1992; Shareef et al., 2011). In addition, the results of our pilot study demonstrated overwhelming empirical value of the scale.

4.5 Pilot Study

For testing the credibility of the instruments, and to provide room for adjustment, pilot study using five Likert-scale prototype questionnaire was conducted around August 2013. During the exercise, seventy surveys were distributed to Nigerian nationals in Malaysia. More specifically, the survey were distributed to faculty members and students in UUM as a technique to validate the instrument. Out of the total survey distributed, fifty-seven questionnaires were filled and returned. Using the data obtained from the pilot study, SmartPLS version 3.0 was used to obtained viability of criterion validity, convergent validity and discriminant validity as shown in Table 4.5.

Table 4.5

Validity and Reliability of the Study Constructs

Var	AVE	Composite Reliability(p_c)	Cronbach's Alpha
CSE	.70	.88	.79
OBS	.57	.87	.83
PATU	.66	.91	.87
ITP	.91	.97	.95
RA	.76	.94	.92
TEO	.83	.95	.94
TIT	.74	.94	.93
TPO	.69	.90	.89
TR	.60	.81	.75

The results of the pilot study showed better fit of the model with high average variance extracted (AVE), composite validity (pc) and cronbach's alpha of the constructs.

4.6 Questionnaire Administration

The study utilized survey instrument through which primary data were collected by reaching people at home being the most appropriate technique of conducting national survey (Scheaffer et al., 1996). Having obtained lists of household of the areas under study from the Nigerian Postal Service and housing development authorities in the selected states, the researcher has undertaken physical inspection of the selected housing units and assigned numbers. The assigned-houses were later selected using simple random technique.

In the Northern Nigeria in general and the three States that constitute sample of this study in particular, Hausa is the most widely spoken language notwithstanding English being the official language in the country. In order to facilitate response rate, the survey questionnaire was translated into Hausa language using black and white translation for the respondents who can neither read nor understand English language. To accomplish the work, services of two professional linguists with Hausa and English languages bias were engaged.

Data collection for this study involved series of strenuous activities such as travelling, distribution, and collecting back filled questionnaire. Therefore, services of four research assistants with at least graduates' degree in social science and humanities were engaged to fast track the process. In the light of the above, the researcher and the research assistants engaged in self-administration of the questionnaire to the selected households.

The respondents were given time within which to fill the questionnaire before collection. For those who cannot read the questionnaire in either of the languages (English or Hausa), the questionnaire was read to their hearing and their chosen opinions from the available options were recorded. Demographic information of the respondents was obtained to distinguish opinions of various social milieus. Dates for the distributions and returns of questionnaires were tracked (Bell, 2005). Sample of the questionnaire is annexed at Appendix B. Moreover, secondary data in form of documented literature such as government diaries, reports and other gazette were also used where necessary.

4.7 Qualitative Research Design

In this section, steps-by-step procedure for qualitative data collection and interpretations is highlighted. The procedures include research design, face-to-face interview, participants' selection, content analysis, validity and reliability, data analysis procedure and potential ethical issue guiding our conduct for qualitative inquiry.

By qualitative means, this section focused on interviews and that, it does not attempt to quantify results through formal measurement of statistical analysis. Instead, the philosophy of this qualitative research designs emphasizes on the phenomenological basis that seeks to explore, elaborate and describe 'meaning' of a phenomenon under study.

4.7.1 Face-to-Face Interviews

The study utilized face-to-face interview being the most commonly used method of data collection technique with the highest response rates. Also, because of the comparative advantage of the technique that allows the interviewer to explore surrounding environment, use non-verbal communication, and possibility of having a long interview session. The session avails the researcher of the opportunity to ask as many as possible complex and probing questions extensively where needed.

4.7.2 Selection of Participants

The selection of participants for this study is directly link to the objectives of the study, which aimed at exploring the factors with potential implications of imposing decrease in

voter tunout in a drive to adopt e-voting system in Nigeria. Voters nonetheless have their opinions sampled using survey, are the main interview respondents. This is because; the study intends to integrate broad numerical strength of the quantitative and the details of qualitative data to obtain more in-depth, rich and complex yet comprehensive picture of the e-voting adoption as a mechanism for improved voter turnout. To achieve the objective, specific information as well as different perspectives of the voters is required.

Moreover, opinions of other voting stakeholders comprising of party officials and electoral officials were minimally sampled to augment understanding of the factors imposing decrease in voter turnout in a drive to e-voting adoption. Those categories of participants are selected considering their stake in e-voting system either as e-voting policy formulators and implementers, user or beneficiary and mobilizers. Using purposeful technique, the researcher intentionally selects the interviewees with the sole purpose to maximize information-rich sources that enable detailed understanding of the phenomenon.

Regarding the number of the interviewees, various sample size are available for qualitative inquiries. Depending on the requirements of the study, it is often argued that the larger the number of cases the more unwieldy the study become and resulted in shallow understanding of the phenomenon. In another word, the fewer the cases studied the more in-depth understanding of the phenomenon (Creswell, 2012). Futhermore, after rewiewed of five hundred and sixty qualitative studies from theses.com, Mason (2010) substentiates Glaser and Strauss's (1967) idea that saturation is central in the equation bodering on how many interviews are enough. This is considering the fact that qualitative research concerns with meaning of a social phenomenon and not generalization of hypotheses (Crounch & McKenzie, 2006).

Saturation entails a point when collection of additional data does not seems adding further understanding of the issue under investigation. Practically, at a point, increase in number of interviews does not lead to increase in information. Mason (2010) elicudated that rather than pre-determined sample, point of dimishing return is an essential criterion for determining qualiataive sample. Several criteria has been indentified for determining qualiatative sample most of which range from five to sixty depending on whether the research is ethnography/ethnoscience, grounded theory, phenomenology type of qualitative investigation. However, a stream of scholar pegs fifteen as the minimum acceptable sample for qualitative study (Bertaux, 1981; Guest et al., 2006; Mason, 2010). While taken into consideration information saturation, this study adopts intermediate cases of twenty-five participants as shown in the Table 4.6.

Table 4.6

Statistics of Qualitative Participants

Interviewee	Frequency	Percentage
Voters	15	60%
Electoral Officials	6	24&
Party Officials	4	16%

4.8 Content Analysis

This study embarked on using directed content analysis in which initial coding starts with relevant research findings based on the underpinning theories. Then, in the course of the analysis, themes were allowed to emerge from the data that led to emergence various factors affecting voter turnout. By this approach, our conceptual framework is validated and theories extended. Through out the qualitative analysis, we engaged a technique that involved systematic and transparent procedures for processing and analyzing data for valid

and reliable inferences. The technique also enables revealation of domain-based factors that affect election participation beyond ordinary technological attributes of DoI. Using systematic and objective interpretation of qualitative data, this study adopted classification and coding procedure for identification of themes in the overall process of data analysis.

4.8.1 Reliability and Validity

Given qualitative background of this segment, it is difficult to achieve absolute reliability and validity as obtained in quantitative techniques because the researcher developed interaction with the unit(s) being studied involving dynamic processes. However, while designing this study nonetheless qualitative, validity and reliability of the data and procedures were optimally considered by careful and strict compliance with the established norms and ethics of qualiatative paradigm throughout the processes of collecting data, analyzing and reporting.

Since the cardinal objective of our study is aimed to generate understanding of the factors affecting voter cognitive decision to participate in elections, the researcher carefully and meticulously report a step-by-step rigor involved in the entire processes and procedures with considerable degree of details truthfully and honestly. The report of the analysis conveyed authentic and undiluted views and feelings of respondents without prejudice to original ideas, thoughts, or expressions.

Furthermore, the data collected during the pilot were analyzed based on the stated objectives of the study. Reflected in the outcome of the pilot analysis, the respondents demonstrated proper understanding of the research objective including the queries as reflected in their views. Areas that required clarifications were identified and addressed

appropriately. Use of a variety of persuasive techniques and distinct measures nonetheless, qualitative data collected during pilot study; consequent steps taken to analyze the data itemized into raw data, data reduction and process notes and the themes emerged thereof are in tandem with the data collected during the actual study. The indepth interviews complement the quantitative findings and the richness of the former extended understanding of the factors influencing voter to participate in election beyond the confined of quantitative variables. Based on the foregoing, we can therefore be assertive that the qualitative data demonstrated credibility, confirmability, dependability and consistency of our data and procedures as essential criteria for quality. It can also be deduced that our qualitative instrument is defendable capable of collecting credible information. Aanother evidence of worthiness of our qualiatative data and procedure is combination of numerical strength of quantitative inquiries and confirmability of the indepth interviews – triangulation methodological technique of answering our research objectives that yielded to in-depth understanding of socio-psychological phenomenon on how voting system preference influences voter cognitive decision to participate in election.

4.9 Potential Ethical Issues

The researcher strictly adhered to the ethical guidelines being essential part of qualitative research. Specifically, the researcher carefully observed sensitivity, privacy, anonymity and confidentiality of the respondents throughout the study. This is considering the fact that ethical issues are delicate areas of interaction between the interviewer and interviewee with potential risk capable of jeopardizing the credibility of the exercise. In summary,

while conducting the interviews, the researcher observed the standardized potential ethical issues as outlined by Saunders, Lewis and Thornhill (2009, p. 185), thus:

i. Observing the rights of privacy of individuals.
ii. Participation is voluntary and participant has the rights to withdraw at will.
iii. Obtaining consent and possible reception of participants.
iv. Maintaining the confidentiality of data provided by participants and their anonymity.
v. Interacting with the participants in a way to seek to collect pertinent data.
vi. Effect on participants of the way in which data is analyzed and reported.
vii. Behavior and objectivity of the researcher.

4.10 Results of Qualitative Pilot Study

Using the interview protocol, the researcher conducted pilot interview using five participants, i.e. three voters, one INEC staff and one party official as a prelude to emerging themes. Using queries in Nvivo qualitative analysis software, some of the themes emerged from the pilot study for research question three include lack of trust and confidence in the government officials; partisanship of electoral officials; bribery and corruption; money politics; do-or-die politics. Other themes emerged include autonomy and financial independence of INEC, inadequate professional and experienced staff, inadequate computer and internet availability, high rate of illiteracy, electricity supply, unavailability of information and lack of trialing the technology.

As for the research question four – solutions to the problems imposing decrease in voter turnout in a drive to use e-voting system, some of the themes emerged include effective participatory policy process, severe anti-corruption laws, absolute independence and autonomy of INEC, community policing, effective information dissemination strategy, technological attributes, incremental implementation of the technology, provision of requisite facilities and electricity supply.

4.11 Summary

This chapter provided accounts for the overall research design that is based on convergent parallel methodological triangulation. From the quantitative angle, the chapter focused on the step-by-step procedure for sample size and sampling technique; instrumentation and data collection technique. On the qualitative account, research design comprising of interview, participants' selection, reliability and validity of the method were also discussed. The chapter concluded by explaining potential ethical issues and finally procedure for mixed methods of data analysis.

CHAPTER FIVE

QUANTITATIVE DATA ANALYSIS

5.1 Introduction

This chapter concerns with presentation and analysis of quantitative data collected through survey instrument. The section discussed about data preparations and response rate from the field. Also discussed, preliminary data screening and cleaning aimed to ascertain normality of the data. Thus, data characteristics, missing data and factor analysis of the main variables were discussed. Furthermore, the validity and reliability of the measurements were reported. Using PLS approach, the measurement (outer model) and structural (inner model) as well as path relationship were also discussed.

5.2 Response Rate, Unengaged Response, Data Editing and Validation

For this study, a response rate of 87.6% was achieved from five hundred survey questionnaires proportionately distributed across the three States of Bauchi Gombe and Taraba. The response rate is considered high in line with the opinion of Creswell (2012) who held a view that a response rate from 50% upward is considered adequate. Distributions and response rate is depicted in Table 5.1.

Table 5.1

Questionnaire Distributions and Responses

Items	Bauchi	Gombe	Taraba	Total (%)
Questionnaire Distributed	243	128	129	500
Number of Returned Questionnaire	211	110	117	438
Number of Valid Questionnaire	198	100	113	411
Response Rate	86.8%	85.9%	90.7%	87.6%
Valid Response Rate	81.5%	78.1%	78.6%	82.2%

As shown in Table 5.1 above, from four hundred and thirty-eight survey questionnaires completed and returned, twenty-seven were discarded due to non-completion, excessive missing values, and or multiple choices on single item(s). The remaining four hundred and eleven survey were valid for further screening.

5.2.1 Description of the Sample of Study

Presented in this section, description of demographic information of the sample who participated in this study. The characteristics examined are considered important to the study as they are capable of providing plausible explanations on the seeming digital divides among various groups of respondents, thus, gender, age, level of education, level of income, level of computer skills, residential location and number of participation in election.

Table 5.2

Summary of Demographic Variables of the Respondents

Variable/Categories	Frequency	Percentage
Gender		
Female	161	39.2
Male	250	60.8
Age		
Young Age	143	34.8
Middle Age	218	53
Older Age	50	12.1
Educational Qualification		
Zero Qualification	23	5.6
Lower Qualification	276	67.2
Higher Qualification	112	27.2
Residence		
Rural	270	65.7
Urban	141	34.3
Income		
Extremely Low Income	174	42.3
Low Income	198	48.2
High Income	22	5.4
Very High Income	17	4.1
Computer Literacy		
No Computer Skills	151	36.8
Basic Computer Skills	140	34
Advanced Computer Skills	120	29.2
Number of Participation in Previous Elections		
Never	7	1.7
One Time	49	11.9
Two Times	99	24.1
Three Times	110	26.8
Four Times	108	26.3
More than Four Times	38	9.2

Gender distributions of the respondents are lopsided with male population being dominant. Gender discrimination of women is deeply rooted in the cultures and belief systems of Northern Nigerian communities that often implicate women isolation from political activities. The skewness of the respondents to rural residence (65.7%) as against 34.3%

urban residence was due to inability of the study to distinguish semi-urban residence. This contributed in classifying a large number of respondents as rural populace.

As an important variable of digital divides, income distributions of the respondents revealed that majority of the respondents have fallen within the first two categories of extremely low and low-income earners. The income distributions almost reflect the overall income distributions of Nigerian population (National Bureau of Statistics: Nigeria Poverty Profile, 2010; Harmonized Nigeria Living Standard Survey, 2010).

Similarly, Table 5.2 revealed that majority of the respondents has advanced computer skills. However, in the course of follow-up, the researcher was made to understand that some respondents considered ability to manipulate hand-held cell phone as having computer skills. In addition, other respondents are fun of creating false image regarding their computer skills. The fallacies influenced overblown response of advanced computer skills. Summarily, the descriptive statistics showed that respondents from diverse demographic backgrounds provided the data used in this study.

5.3 Data Normality Assessment

Preliminary data screening using IBM SPSS version 20.0 was conducted. Using missing value analysis (MVA) test, this study adopts mean substitution approach in view of the negligible percentage of the missing values. Twenty-one (21) cases with extreme values were detected following Mahalanobis D^2 technique using significant Chi-square of 67.985, degree of freedom (df) of 41 and probability value of $p < .01$. Having established the accuracy of the data entry, and by examination, neither a single variable is responsible for

the outliers nor does elimination of a single variable can reduce their effect. Also, eliminating the cases with outliers would not in effect, be critical to the analysis, the twenty-one (21) cases confirmed outliers were deleted.

The result of the multicolinearity assumption conformed to acceptable standard of a tolerance value of .10 and above and inversely, a variance inflation factor (VIF) value of below 10. It is therefore evident that multicollinearity is not a problem for this study. In addition, this study adopted skew-ness and kurtosis techniques for assessing normality distribution of the variables. Using the traditional critical values of ±2.58 (.01 significance level) and ±1.96, (.05 error level) as a threshold (Hair, Black, Babin, & Anderson, 2014), the results of skew-ness and kurtosis test for this study indicated that the data are non-normally distributed. This is in conformity with the contemplation that "real data rarely conform to normality" (Schafer & Graham, 2002, p 167). Nevertheless, PLS approach is generally preferred to treat situations where the requirements of interval scaled data and multivariate normality cannot be fulfilled (Sarstedt & Wilczynski, 2009).

5.4 Justification for Using PLS Path Modeling

Partial Least Square Structural Equation Modeling (PLS-SEM) has increasingly gaining acceptability as the most populous multivariate method of analysis in various disciplines (Wold, 1982; Lohmoller, 1989). Recently for example, PLS-SEM has been deployed to analyze data in the field of accounting (Lee, Petter, Fayard, & Robinson, 2011), international marketing (Henseler, Ringle, & Sinkovics, 2009) and management information systems (Ringle, Sarstedt, & Straub, 2012). Having recognized PLS-SEM's

flexibility in handling various modeling problems across disciplines, using the method in disseminating public administration research is not as widespread as in other fields. This rare dissemination suggests that PLS-SEM use in public administration presents numerous application opportunities.

In view of the relevance of PLS-SEM to the major constructs of the study being investigated, we opted for the use PLS-SEM approach to undertake confirmatory factor analysis of the outer measurement model, and analysis of the structural modeling of the hypothesized relationships. Conforming to appropriate software citation criteria (Hair, Ringle, & Sarstedt, 2013; Temme, Kreis, & Hildebrandt, 2010), this study used SmartPLS beta 3.0 for PLS-SEM outer measurement model and inner structural modeling.

5.5 Confirmatory Factor Analysis (CFA)

Haven adapted all the items for measurements of the variables from previous studies, the need for exploratory data analysis for this study is out of context (Hair et al., 2010). Therefore, principal component analysis was used to determine the structure of the research model. Confirmatory factor analysis (CFA) for this study was conducted using the PLS algorithm in build in SmartPLS 3.0 (beta). The results of the principal component analysis for all the initial 42 items for the 9 variables remain intact as none of the items was dropped due to loading or cross loading issue as indicated in Table 5.3.

Table 5.3

Cross Loadings of the Study Variables

Var	CSE	ITP	OBS	PATU	RA	TEO	TIT	TPO	TRB
CSE1	**.820**	.264	.272	.336	.319	.004	.300	.007	.190
CSE2	**.882**	.297	.316	.398	.353	.033	.359	-.081	.246
CSE3	**.920**	.368	.382	.450	.431	.022	.409	-.072	.291
CSE4	**.906**	.356	.370	.450	.413	.023	.409	-.094	.244
CSE5	**.833**	.359	.407	.482	.416	.058	.417	-.071	.273
ITP1	.331	**.923**	.527	.437	.626	.124	.521	-.003	.378
ITP2	.330	**.933**	.533	.394	.607	.162	.509	-.061	.373
ITP3	.389	**.904**	.548	.460	.675	.141	.549	-.049	.372
OBS1	.385	.509	**.821**	.430	.551	.086	.553	-.016	.399
OBS2	.366	.544	**.865**	.458	.544	.121	.580	-.062	.382
OBS3	.317	.471	**.831**	.375	.487	.162	.539	-.101	.310
OBS4	.281	.391	**.772**	.436	.486	.174	.498	-.179	.278
OBS5	.293	.440	**.784**	.395	.507	.201	.554	-.182	.303
PATU1	.438	.413	.417	**.855**	.437	.103	.434	-.106	.279
PATU2	.382	.405	.408	**.842**	.413	.133	.473	-.156	.274
PATU3	.365	.341	.397	**.846**	.454	.141	.438	-.140	.238
PATU4	.431	.387	.472	**.867**	.511	.203	.523	-.192	.208
PATU5	.451	.426	.473	**.825**	.549	.164	.496	-.170	.239
RA1	.389	.583	.500	.424	**.833**	.080	.480	.007	.399
RA2	.390	.630	.568	.482	**.895**	.100	.592	-.033	.377
RA3	.417	.631	.550	.547	**.881**	.114	.550	-.052	.380
RA4	.372	.611	.583	.490	**.872**	.102	.583	-.056	.427
RA5	.357	.511	.518	.459	**.819**	.138	.574	-.081	.297
TEO1	.022	.171	.179	.181	.127	**.911**	.220	-.457	.027
TEO2	.016	.161	.163	.144	.106	**.936**	.229	-.511	-.007
TEO3	.052	.087	.135	.134	.086	**.871**	.198	-.477	-.036
TEO4	.064	.052	.125	.168	.110	**.804**	.211	-.477	-.111
TIT1	.405	.519	.537	.451	.543	.175	**.835**	-.117	.260
TIT2	.403	.499	.606	.517	.532	.218	**.861**	-.189	.278

Var	CSE	ITP	OBS	PATU	RA	TEO	TIT	TPO	TRB
TIT3	.409	.478	.589	.472	.574	.164	**.861**	-.147	.174
TIT4	.399	.515	.585	.476	.586	.201	**.866**	-.173	.239
TIT5	.296	.446	.539	.472	.540	.232	**.820**	-.226	.205
TIT6	.285	.420	.513	.433	.473	.242	**.799**	-.227	.233
TPO1	-.055	-.042	-.100	-.160	-.040	-.479	-.198	**.913**	.031
TPO2	-.077	-.045	-.127	-.167	-.047	-.510	-.198	**.925**	.026
TPO3	-.121	-.011	-.142	-.187	-.097	-.460	-.171	**.803**	.034
TPO4	-.045	-.024	-.091	-.145	-.021	-.434	-.163	**.860**	.010
TRB1	.220	.350	.292	.227	.334	-.062	.210	.106	**.832**
TRB2	.245	.358	.368	.259	.421	-.057	.247	.037	**.879**
TRB3	.216	.326	.328	.193	.332	.002	.177	.014	**.836**
TRB4	.244	.319	.367	.269	.381	-.003	.239	-.001	**.840**
TRB5	.285	.353	.389	.282	.374	.067	.284	-.040	**.815**

The bold scores are cross loadings of items exclusively for each variables. The results of the scores for each of the items of a variable revealed high correlation within themselves while denouncing inter-correlation between the variables. Meaning, high scores of items' loading among themselves compare with other items measuring another variable indicated the relevance and fittingness of the items in measuring the variables they are meant to measure. Having the variables met the basic requirements of the measurement; all the items are therefore retained for further analysis. Confirmatory factor analysis also provided correlation matrix between the factors and the total scores as requisite to obtain the construct validity of the measuring scales.

5.5.1 Construct Validity

Considering all the items have been adapted from previous research studies, the content validity were examined and certified by two experts in the field of public administration from the Ghazali Shafie Graduate School of Government (GSGSG) and two others from the School of Technology Management, Othman Yeop Abdullah Graduate School of Business (OYAGSB), including some research colleagues. In complementary, results of pilot study further validated the instrument.

To measure construct validity, multivariate procedures such as confirmatory factor analysis and correlation matrix are used while component of construct validity including convergent validity, criterion validity and discriminant validity (Zikmund et al., 2009). Internal consistency was high for all the items.

When the outer loadings of items indicators of a construct are high, it is an indication of association in measuring the construct. Using AVE statistical method for establishing convergent validity of constructs (Hair, Hult, Ringle, & Sarstedt, 2014), the basic requirement for convergent validity is fulfilled as all items indicators are statistically significant with at least standardized outer loading of > .708. This is an indication that the latent variables explain at least 50% of the indicator variance. Having estimated the measurement loadings, their accompanying validity and reliability values were depicted in Table 5.4.

Table 5.4

Validity and Reliability of the Study Constructs

Var	AVE	Composite Reliability	R Square	Cronbach's α	Communality	Redundancy
CSE	.76	.94		.92	.75	
ITP	.85	.94	.53	.91	.84	0.030
OBS	.67	.91		.87	.65	
PATU	.72	.93		.90	.72	
RA	.74	.93		.90		
TEO	.77	.93		.91	.77	
TIT	.71	.94		.92	.70	
TPO	.77	.93		.91	.77	
TRB	.71	.92		.90	.70	

Based on the Table 5.4, AVE scores for the study's variables were obtained. It is therefore explicit that all the scores of the AVE have exceeded the value of > .70 as recommended by Fornell and Larcker (1981) except for the perceived observability variable with a score of .67. However, Kline (1998) explained that dealing with psychological constructs may likely results into having value of > .60 due to multiplicity of the constructs being measured. Therefore, we resolved to the opinion of Anderson and Gerbing (1988), Shook, Ketchen, Hult and Kacmar (2004) who recommended value of ≥ .50 as acceptable score for AVE.

5.5.2 Discriminant Validity

Establishing discriminant validity in a model concerns with uniqueness of a construct to represent and explain a phenomenon that is not capture by other construct within the model (Hair, Hult, Ringle, & Sarstedt, 2014). Zikmund et al. (2009) suggested as a rule of thumb, correlation of not more than .75 for discriminant validity. Using Fornell–Larcker criterion, square root of the value of AVE with the latent variable correlations were taken to establish discriminant validity. In view, it is indicative that all the constructs have met the requirement, as the square roots of each of the constructs' AVE were greater than highest correlation with any other construct. Therefore, we conclusively assert that latent variables for the study have shared more variance with their respective assigned indicators than with any other latent variable as indicated in Table 5.5.

Table 5.5

Discriminant Validity

	CSE	ITP	OBS	PATU	RA	TEO	TIT	TPO	TRB
CSE	**.87**								
ITP	.38	**.92**							
OBS	.41	.58	**.82**						
PATU	.49	.47	.51	**.85**					
RA	.45	.69	.63	.56	**.86**				
TEO	.03	.15	.18	.18	.12	**.88**			
TIT	.44	.57	.67	.56	.65	.24	**.84**		
TPO	-.08	-.04	-.12	-.18	-.05	-.54	-.21	**.88**	
TRB	.29	.41	.42	.29	.44	-.01	.28	.03	**.84**

Table 5.5 offered the latent variable scores and an evidence of discriminant validity. Accordingly, strong discriminant validity was established for all the items as the loadings are found within the acceptable limit of ≥ .70 and fit indices of ≥ .90 in accordance with Shook, et al (2004).

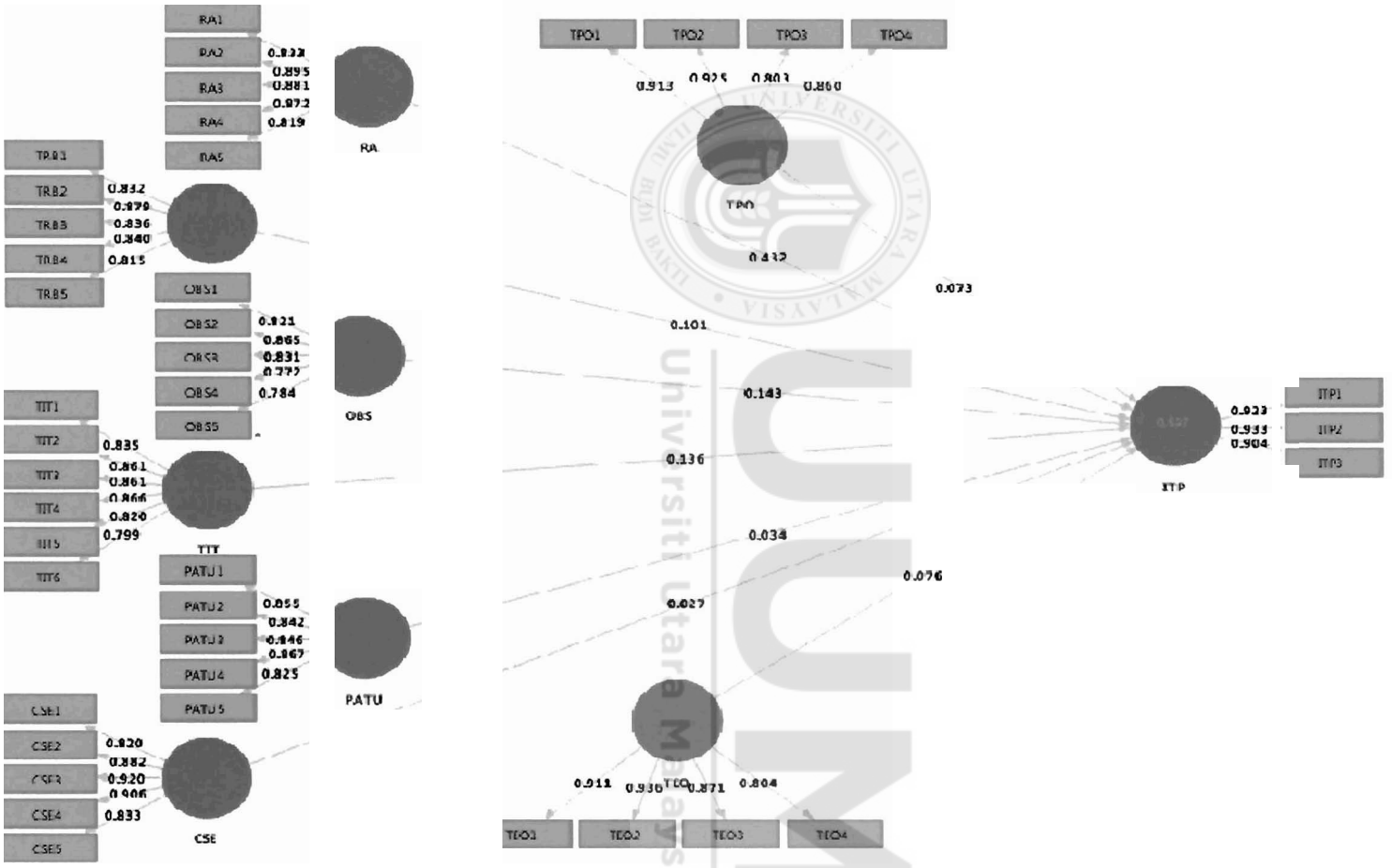

Figure 5.1. PLS structural model

Concerning the second criterion, cross loadings is a liberal form of assessing discriminant validity. It concerns with the loading of each indicator. Discriminant validity of a construct is at stake when any cross loadings exceeds indicator outer loadings. Observing the bold scores in the Table 5.5, the latent variable scores of associated indicators were greater than all of the cross-loadings (Chin, 1998; Go¨ tz et al., 2009; Hair, Hult, Ringle, & Sarstedt, 2014) suggesting strong discriminant validity for all the items. While the Fornell–Larcker criterion evaluates discriminant validity on the construct level, the cross-loadings allow this kind of evaluation on the indicator level.

5.5.3 Internal Consistency Reliability

This section reported internal consistency reliability evidence on the data produced from each of the study's instrument. The construct validity were obtained by factor analyses with varimax rotations computation of the data. Selection of orthogonal computation of the varimax rotation was meant to maximize the variance explained and for ease of interpretation. Having computed the varimax rotations, the construct validity for the study were obtained.

Reliability simply means consistency of the measurement. It concerns with the ability and strength of the measurement to produce consistent results at different point in times and under different conditions, including possibly different samples. Three common approaches to assess reliability include test re-test, internal consistency and alternative form (Mitchell, 1996).

Test re-test reliability as one of the technique of reliability is obtained by correlating two data collected using the same questionnaire items collected under as near similar as possible conditions. This requires twice administration of the questionnaire to respondents. As a form of test retest reliability, a pilot study was undertaken on small sample size using the same measuring items and at close range with the main data collection. The statistical analysis of reliability of all the items is high at the pilot test.

Cronbach's Alpha (α) is commonly used statistical techniques for calculating internal consistency. However, in PLS-SEM algorithm, composite reliability is more appropriate criterion to establish internal consistency reliability as compared to Cronbach's α (Hair, Sarstedt, Pieper, & Ringle, 2012; Chin, 2003). Nonetheless, practice of reporting both Cronbach's (coefficient α) and composite reliability in PLS-SEM approach has been acknowledged in the literature.

Assessing the reliability of the latent variables estimated by PLS, both the composite reliability and Cronbach α were calculated as depicted in Table 5.4. The results of composite reliability ranges from .91 (Perceived Observability) to .94 (Computer Self-efficacy, intention to participate and trust in the technology), which indicated that all the constructs exceeded the recommended minimum of ≥ .70 and within the bound of ≤ .95. Similarly, scores for the latent variable correlation indicated high reliability of all the constructs in that all the scores for the Cronbach's α were close to 1 i.e. from .87 (Perceived Observability) to .92 (Computer Self-efficacy). This result is consistent with the literature (Hair, Hult, Ringle, & Sarstedt, 2014; Nunally & Bernstein, 1994; Vanderstoep & Johnston, 2009; Fornell & Larcker, 1981).

5.6 Inner (Structural Model)

Direct relationship is one of the criterion for measuring values and significance of structural model. Nonetheless, inner model can also be examined by total effect (the sum of direct and indirect effects) most especially when a research explores the differential impact of mediating variables on different driver constructs on a criterion construct (Albers, 2010).

Having conducted PLS path multiple regressions, the results of the hypotheses testing were obtained. In this section, results of the study's structural model particularly hypotheses testing were presented. Explanations of the hypotheses tested were provided for both direct effect between exogenous and endogenous variables; and total effect including mediating effect. Furthermore, using the PLS bootstrapping output, the mediating effect was also calculated.

5.6.1 Resample Size

Provision of information concerning the use of the PLS-SEM algorithm on the weighting scheme used and the abort criterion is one of the neglected areas and hence, the need to report detailed resampling procedures in PLS-SEM studies is emphasized. This is especially owing to the fact that misspecification of bootstrapping in relation to original sample size can lead to bias results. Specifically, reporting maximum number of iterations is particularly useful to determine "whether or not the PLS-SEM algorithm converged before reaching the pre-specified stop criterion" (Hair, Sarstedt, Pieper, & Ringle, 2012, p 333). To assess direct and mediating interaction between exogenous, mediating and endogenous constructs, this study adopt use of bootstrap resampling procedure (Efron &

Tibshirani, 1993) using 5000 resamples (Hair, Hult, Ringle, & Sarstedt, 2014; Hayes, 2009).

5.6.2 Main Effect

It is important to note that all the main variables of the study are uni-dimensional and there had neither change nor deletion of any of their item indicators after the CFA was conducted. Therefore, all the variables of the study have been retained as initially hypothesized.

Although, estimating direct effect of X on Y for the purpose of interpretation mediation is not always a necessary condition (Zhao, Lynch, & Chen, 2010), Hair, Ringle and Sarstedt (2013) pointed out that direct effect of X on Y makes understanding and interpretation of mediation analysis easier. In addition, direct effect relationship is one of the hypothesized relationships developed for this study, hence; results for the direct effect analysis is also presented thereof.

a. Restatement of Main Effect Hypotheses

This section focused on testing and validating the main effect hypotheses in accordance with a model developed. Accordingly, seven main effects involving eight variables have been hypothesized in line with research question one. Specifically, seven exogenous variables were hypothesized to have direct effect on endogenous variable. The exogenous variables are perceived trialability, perceived observability, and perceived ability to use, trust in the technology, trust in the electoral government officials, trust in the politically elected government officials and computer self-efficacy while intention to participate is the

endogenous variable. In line with research question one, restated below, hypotheses involving direct effect as a reflection and in preparation for testing the effects.

H_1 Perceived Trialability of e-voting system (TRB) positively influences voters' intention to adopt the system.

H_2 Perceived Observability of e-voting system (OBS) positively influences voter's intention to adopt the system.

H_3 Perceived Ability to Use (PATU) positively influences voters' intention to adopt e-voting system.

H_4 Trust in technology (TIT) positively influence voter's intention to adopt e-voting system.

H_5 Trust in Electoral Government Officials (TEO) positively influences voters' intention to adopt e-voting system.

H_6 Trust in Politically Elected Government Officials (TPO) positively influences voter's intention to adopt e-voting system.

H_7 Computer Self-efficacy (CSE) positively influences voters' intention to adopt e-voting system.

b. Results of Main Effect Hypotheses

In accordance with research question one and the hypothesized relationships developed thereof, presented in this section, the results of the direct effects of seven independent constructs on dependent construct, intention to adopt e-voting system. To assess the interaction effect among the constructs, a bootstrap resampling procedure (Efron & Tibshirani, 1993) was performed using 5000 resamples (Hair, Hult, Ringle, & Sarstedt, 2014; Hayes, 2009).

Discussions of the direct effects between the variables particularly the individual contributions of each exogenous variables are represented by the standardized beta values within the PLS structural model (Chin, 1998b). In testing the structural model relationships, the choice of significance level was set at $p < .05$ and $p < .01$ (Hair et al., 2010).

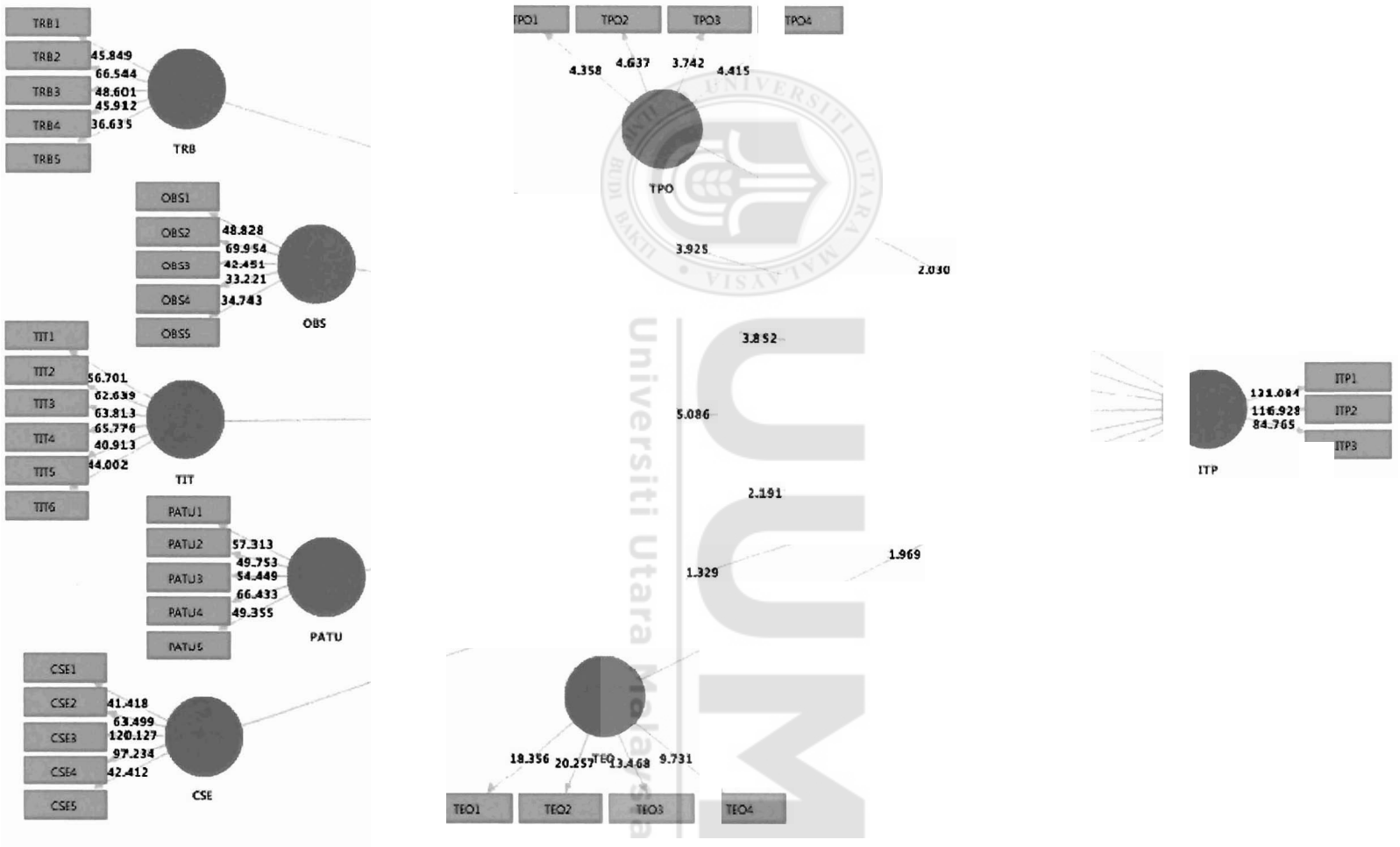

Figure 5.2. Main effect bootstrap

Figures 5.2 above is a graphical representation of the bootstrap illustrating standardized path coefficient (β) and t-values for the hypothesized relationships. As depicted in the Figures 5.2, the results of the bootstrap indicated that six of the seven direct relationships demonstrated significant positive relationships while one path, nonetheless positive, not significant at $p < .05$.

Table 5.6

Results of Main Effect between Exogenous and Endogenous Variables

H_0	Relations	Beta (β)	SM	St. Error	t – value	Decision
H_1	**TRB -> ITP**	.178**	.181	.045	3.93	Supported
H_2	**OBS -> ITP**	.240**	.240	.062	3.85	Supported
H_3	**PATU -> ITP**	.114*	.116	.052	2.19	Supported
H_4	**TIT -> ITP**	.275**	.269	.054	5.09	Supported
H_5	**TEO -> ITP**	.086*	.078	.044	1.97	Supported
H_6	**TPO -> ITP**	.113*	.098	.056	2.03	Supported
H_7	**CSE -> ITP**	$.061^{ns}$	.063	.046	1.33	Not supported

** indicates significance level at $p < .01$
* indicates significance level at $p < .05$
^{ns} indicates not significant

Similarly, Table 5.6 above has statistically shown the standardized path coefficient (β), standard error, t – value and p – value explaining the hypothesized relationships between the exogenous variables and endogenous variable. In social science, significance levels of ($p < .01$ or .05) are usually required for statistical measurements such as direct effect, total effect and power of statistical tests for consistent results (Chin, 2003). Specifically for this study, six of the seven paths, demonstrated significant positive effects from which three were strongly significance at .01, three others were significance at .05 while one path is positive but nonetheless, not significant.

The results demonstrated that the more a voter perceives trialability (TRB) of the e-voting system, the more increases his/her intention to adopt the system ($\beta = .178$; $t = 3.93$, $p < .01$). This means voter's intention to adopt is positively influenced by his/her perception of being giving opportunity to trial the technology. The results supports hypothesis H_1, which states that perceived trialability of e-voting system (TRB) positively influences voter's intention to adopt.

In addition, the results demonstrated strong significant positive influence of perceived observability (OBS) on voters' intention to adopt e-voting system ($\beta = .240$; $t = 3.85$, $p < .01$). It's therefore explicit that the more a voter perceives outcome of using e-voting system as being conspicuously visible, and capable of demonstrating the results to others, the more influences his/her decision to use the system. This validates hypothesis H_2, which predicted that perceived observability of e-voting system (OBS) positively influences voter's intention to adopt.

Similarly, the results confirmed hypothesized statement (H_3), which predicted positive influence of perceived ability to use on voters' intention to adopt. The results depicted that increase in voter's perceived ability to use e-voting system increases his/her intention to adopt e-voting system ($\beta = .114$; $t = 2.19$, $p < .05$).

Moreover, the results validates hypothesis H_4 which states that trust in the e-voting system (TIT) positively influences voter's intention to adopt ($\beta = .275$; $t = 5.09$, $p < .01$). By implication, the results have shown that voter's trust in the ability of the technology to deliver; and that technology is free from internal and external attacks strongly and positively influences his/her intention to adopt.

More so, explicitly exhibits in the results that trust in the electoral government officials positively influences voter's intention to adopt. In essence, trust in the electoral government officials to handle the technology effectively devoid of partisanship positively influences voter's intention to adopt the technology. The results confirmed hypothesis H_5 which states that trust in electoral government officials (TEO) positively influences voters' intention to adopt ($\beta = .086$; $t = 1.97$, $p < .05$).

In conformity with hypothesis H_6, the results demonstrated that trust in the politically elected government officials (TPO) is positively related to intention to adopt e-voting system ($\beta = .113$; $t = 2.03$, $p < .05$). Meaning, the more a voter trust in the partisan government officials not to influence the conduct of election or temper with any of its provision the more increase in adoption intention.

In contrast to hypothesis H_7 which conjured that computer self-efficacy positively influences voters' intention to adopt e-voting system, the results indicated that computer self-efficacy is nevertheless positively relate with voter's intention to adopt, but is not significance ($\beta = .061$; $t = 1.33$, $p > .05$). This suggests that computer self-efficacy does not have direct effect on intention to adopt e-voting system.

5.6.3 Analysis According to Demographic Variables

Having obtained the results of our model based on the entire sample of the study, we further segregate the data based on demographic information consisting of educational qualification and income. This section examines specifically for which kinds of people the independent variables exert effect on dependent variable and under what conditions. For

both educational qualification and income, we divided the data into low and high to understand variance and sensitivity among the respondents.

Table 5.7

Results of Direct Effect between Exogenous and Endogenous Variables for Sample of Low Educational Qualification

Relations	Beta (β)	SM	St. Error	t - Statistics	Decision
CSE -> ITP	.399*	.394	.043	9.36	Supported
OBS -> ITP	.244*	.238	.041	5.98	Supported
PATU -> ITP	-.043 ns	-.042	.039	1.09	Not supported
TEO -> ITP	-.214*	-.212	.025	8.42	Supported
TIT -> ITP	.070 ns	.065	.062	1.13	Not supported
TPO -> ITP	.356*	.341	.054	6.61	Supported
TRB -> ITP	.487*	.479	.038	12.88	Supported

*Note: * indicates significance level at p < .01*
ns indicates not significant

Table 5.8

Results of Direct Effect between Endogenous and Exogenous Variables for Sample of High Educational Qualification

Relations	Beta (β)	SM	St. Error	t - Statistics	Decision
CSE -> ITP	.028 ns	.035	.097	.288	Not supported
OBS -> ITP	.312*	.310	.118	2.64	Supported
PATU -> ITP	-.109 ns	-.102	.110	.990	Not supported
TEO -> ITP	-.046 ns	-.060	.132	.349	Not supported
TIT -> ITP	.393*	.374	.144	2.74	Supported
TPO -> ITP	.151 ns	.140	.112	1.34	Not supported
TRB -> ITP	.115 ns	.111	.094	1.22	Not supported

*Note: * indicates significance level at p < .01*
ns indicates not significant

Table 5.7 and 5.8 above presented results based on educational status of the respondents, thus low and high respectively. According to the results, perceived trialability, trust in the electoral government officials, trust in politically elected government officials and computer self-efficacy variables were exclusively significant predictors of intention to adopt among the respondents of low educational qualification whereas trust in the technology was exclusively significant among the respondents of high educational qualification. Perceived observability was significant predictor for respondents of both low and high educational status. On the other hand, perceived ability to use was not significant predictor of intention for respondents of both low and high educational qualification while trust in the technology was exclusively not significant predictor of intention for the respondents of low educational qualification.

By implication, the results have shown that perceived trialability, perceived observability, trust in the electoral officials, and trust in the politically elected officials and computer self-efficacy were vital predictors of intention to adopt among voters of low educational qualification compare to those of high educational qualification. The results also demonstrated that intention to adopt among voters of high educational status is influenced by perceived observability and trust in the technology.

Table 5.9

Results of Direct Effect between Endogenous and Exogenous Variables for Sample of Low Income

Relations	Beta (β)	SM	St. Error	t - Statistics	Decision
CSE -> ITP	.074 ns	.070	.052	1.42	Not supported
OBS -> ITP	.242*	.244	.067	3.62	Supported
PATU -> ITP	.076 ns	.082	.058	1.32	Not supported
TEO -> ITP	.078 ns	.029	.087	.894	Not supported
TIT -> ITP	.295*	.290	.060	4.88	Supported
TPO -> ITP	.067 ns	.046	.048	1.42	Not supported
TRB -> ITP	.184*	.186	.048	3.83	Supported

*Note: * indicates significance level at p < .01*
ns indicates not significant

Table 5.10

Results of Direct Effect between Endogenous and Exogenous Variables for Sample of High Income

Relations	Beta (β)	SM	St. Error	t - Statistics	Decision
CSE -> ITP	-.033 ns	-.029	.086	.383	Not supported
OBS -> ITP	.283*	.281	.116	2.44	Supported
PATU -> ITP	.282*	.278	.102	2.77	Supported
TEO -> ITP	-.058 ns	-.043	.089	.654	Not supported
TIT -> ITP	.108 ns	.111	.094	1.15	Not supported
TPO -> ITP	.004 ns	.006	.089	.050	Not supported
TRB -> ITP	.229*	.230	.086	2.66	Supported

*Note: * indicates significance level at p < .01*
ns indicates not significant

Similarly, Table 5.9 and 5.10 above presented relationships between the exogenous variables and endogenous variable of the respondents of low and high income respectively. The results depicted that intention to adopt for respondents of both low and high-income status is influenced by perceived trialability and perceived observability. Trust in the technology variables was exclusively significant predictors of intention to adopt among the respondents of low income whereas perceived ability to use was excuclusively significant among the respondents of high income. However, trust in the electoral officials, trust in the politically elected offficals and computer self-efficacy were not significant predictors for respondents of both low and high-income status.

5.7 Mediation Effect

Beyond establishing association by mere answering whether independent variable affects dependent variable for e-voting adoption intention, understanding when such relationships between dependent and predictor variables exists and when it does not avails researchers with better understanding of the relationships between technological attribures and voting participation. In this section, we therefore have undertaken deeper understanding of a phenomenon by answering 'how' and 'when' technological attributes influence voting participation, and when they do not. Accordingly, the "how" question brings to relevance, psychological and cognitive traits that causally links technological attributes and voter intention to participate, whereas the "when" question concerns with the boundary conditions of the causal association. This proposition brings the relevance of mediation of relative benefits of e-voting system.

5.7.1 Direct Effect and Indirect Effect

Previous section focused on the analysis of the main effect of technological attributes on adoption intention in accordance to the research question one of this study and in conformity with the hypothesized relationships thereof. This section dealt with research question two, which is divided into direct and indirect effect; and mediating effect. The results of direct and indirect effects were first presented, which paved way for the presentation of actual mediation effects of relative benefits of e-voting.

Hayes explained that determination of empirical mediation effect requires estimation and interpretation of the direct and indirect effects along with inferential tests thereof. Concerning this study, five exogenous variables comprising of perceived trialability, perceived observability, perceived ability to use, trust in the technology and computer self-efficacy were hypothesized to have direct effect on mediating variable, perceived relative advantage as 'path a'. Effect of mediating variable, perceived relative advantage on the intention to participate, which is considered 'path b' was also hypothesized. Therefore, results of the direct effect hypotheses were presented in two different segments in accordance with the hypothesized relationships, thus indirect effect of the independent variables on the mediating variable (path a) and indirect effect of mediating variable on the dependent variable (path b).

a. Restatement of Indirect Effect Hypotheses path a

This section focused on restating and validating hypothesized direct relationship between five independent variables and a mediating variable (a presumed DV). The five hypotheses are here restated:

H_8 Perceived Trialability of e-voting system (TRB) has significant impact on voter perception of relative advantage (RA) of the system.

H_9 Perceived Observability of e-voting system (OBS) has significant impact on voter perception of relative advantage (RA) of the system.

H_{10} Perceived Ability to Use e-voting system (PATU) has significant impact on voter perception of relative advantage (RA) of the system.

H_{11} Trust in technology (TIT) has significant impact on voter perception of relative advantage (RA) of e-voting system.

H_{12} Computer Self-efficacy (CSE) has significant impact on voter perception of relative advantage (RA) of e-voting system.

b. Results of Indirect Effect path a

This section presents the results of the direct effects of hypothesized relationship involving five constructs. A bootstrap resampling procedure (Efron & Tibshirani, 1993) using 5000 resamples (Hair, Hult, Ringle, & Sarstedt, 2014) was adopted.

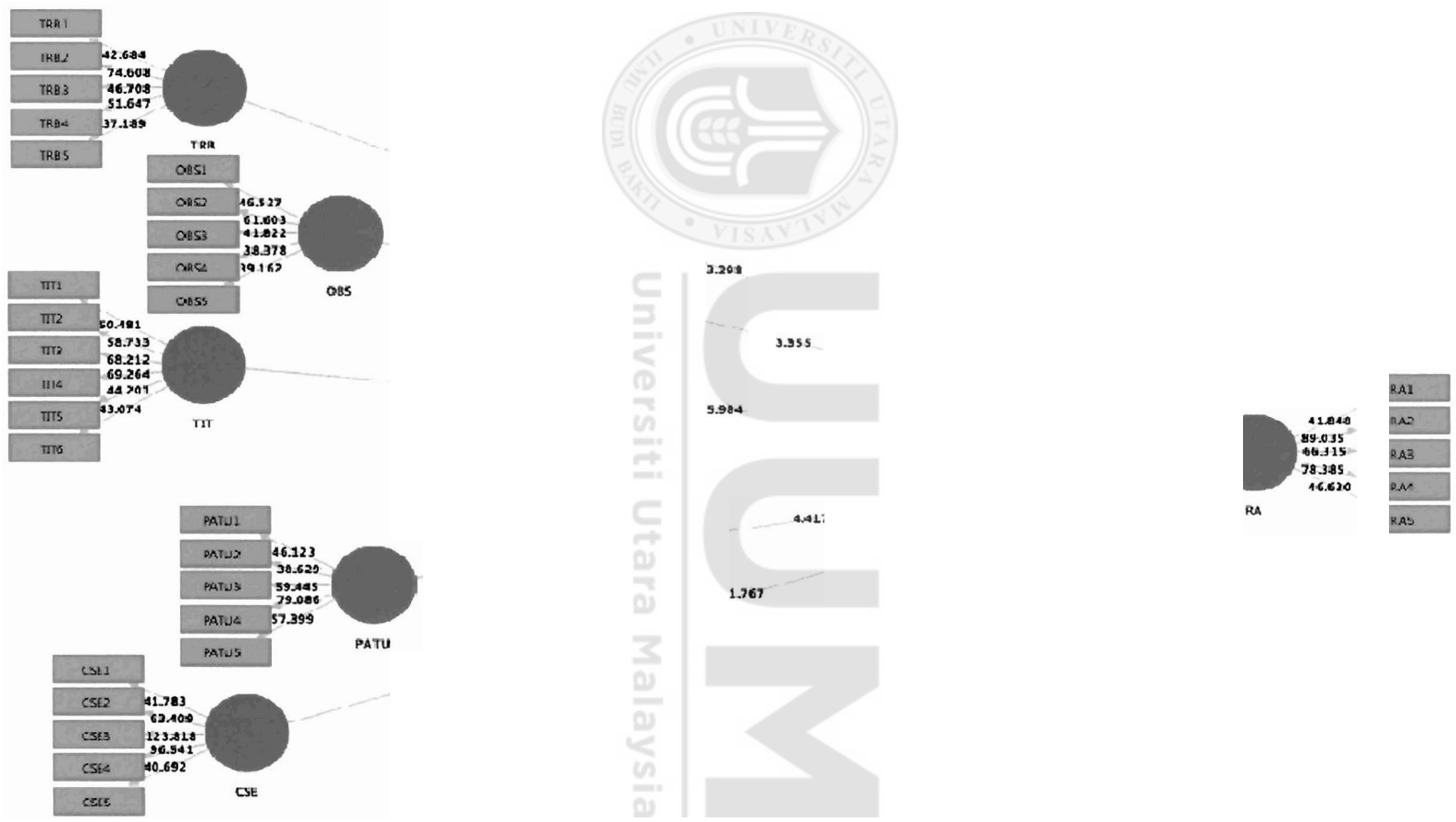

Figure 5.3. Bootstrap between the independent variables and mediator

Graphical representation of the bootstrap illustrating standardized path coefficient (β) and t-values for the hypothesized relationships is shown in Figures 5.3 above. In addition, the results of the bootstrap depicted positive significant relationships of all the paths.

Table 5.11

Results of Indirect Effect Path a

H_0	path a Relations	Beta (β)	S Mean	St Error	t – value	p – value
H_8	TRB -> RA	.185**	.185	.057	3.27	.001
H_9	OBS -> RA	.224**	.222	.065	3.45	.000
H_{10}	PATU -> RA	.180**	.183	.042	4.34	.000
H_{11}	TIT -> RA	.310**	.310	.053	5.89	.000
H_{12}	CSE -> RA	.079*	.079	.043	1.82	.035

** indicates level of significance at $p < .01$
* indicates level of significance at $p < .05$

The standardized path coefficient (β), standard error, t – value and p – value explaining the relationships between the exogenous variables and endogenous variable are statistically represented in Table 5.11 above. Accordingly, all the paths demonstrated positive relationships, suggesting that increase in the citizen's perception of all the independent variables leads to increase in the citizen's perception of relative advantage of e-voting. Four out of the five paths demonstrated strong significant positive effects at $p \leq .01$, whereas one path demonstrated significance at $p \leq .05$.

Specifically as shown in Table 5.11, the results have shown strong and positive significant effect of perceived trialability on perceived relative advantage ($\beta = .185$; $t = 3.265$, $p < .01$). It therefore demonstrates that in the event a voter perceives giving opportunity to trial the proposed e-voting system will strongly influences his/her assessment of perceived

relative advantage of e-voting system. The results therefore validate the hypothesized statement (H_8).

In accordance with Table 5.11, the results of the analysis have shown that perceived observability of e-voting system has strong positive effect on perceived relative advantage of the system ($\beta = .224$; $t = 3.45$, $p < .01$). The results indicated that voter's perception of the outcome of using the e-voting being tangible, visible and capable of sharing with others influences his/her perception of relative advantage of the system thus, supporting hypothesis H9.

Relatedly, perceived ability to use is positively and strongly related to perceived relative advantage of the e-voting system ($\beta = .180$; $t = 4.34$, $p < .01$). This is to say that increase in voter perceived ability to use e-voting system increases his/her perceived relative advantage of the system. The results corroborate with the initial hypothesized statement (H12).

Moreover, trust in the e-voting system to perform, and being free from blameworthiness has strong positive effect on voter's perceived relative advantage ($\beta = .310$; $t = 5.89$, $p < .01$), thus supports hypothesis H10. Furthermore, significant positive influence of computer self-efficacy on perceived relative advantage of the voter was established ($\beta = .079$; $t = 1.82$, $p \leq .05$). Thus, computer self-efficacy of a voter increases his/her perceived relative advantage of e-voting system. The results support hypothesis H11.

5.7.2 Indirect Effect path b

In this section, hypothesized relationships between the mediating variable and the dependent variable would be examined. This segment measures voter perception of e-voting technological attributes and trust in the technology as as essential voting benefits capable of reducing voting costs.

a. Restatement of Indirect Effect Hypothesis path b

In accordance with hypothesis H_{13}, this section presents the effect of perceived relative advantage posing as independent variable and intention to participate in election using e-voting system. The hypothesis states thus:

H_{13} Perceived Relative Advantage (RA) of e-voting system has significant positive impact on voter's intention to participate in election using the system (ITP).

b. Results of Indirect Effect path b

Represented in Figure 5.4, a relationship between perceived relative advantage of e-voting system and voting participation intention. Standardized path coefficient (β) and t-values for the hypothesized relationship is shown in the traditional diagram at Figure 5.4.

Table 5.12

Results of Indirect Effect path b

H_0	path b	β	S. M.	St Error	t value	p value
H_{13}	**RA -> ITP**	.433**	.439	.056	7.69	.000

** indicates level of significance at $p < .01$

As in the Table 5.12, the results of direct relation between perceived relative advantage posing as dependent variable and voting participation intention as independent variable demonstrated strong significant positive relation as evidenced by the standardized path coefficient (β), standard error, t – value, p – value (β = .307; t = 5.76, p < .01). Amazingly, the results suggested that increases in the voter perception of the relative advantage of e-voting, increases his/her intention to participate in voting using the system.

Similarly, bootstrap resampling procedure was conducted using 5000 resamples. The results of the direct effect as depicted in Figure 5.4 have shown significant positive relationship of all the five exogenous variables and the mediating variable. The results therefore validate all the five hypotheses in this section.

5.7.3 Mediating Effects

This section concerns with the presentation and analysis of mediating effect of perceived relative advantage between the independent variables and the dependent variable.

a. Restatement of Mediating Effects' Hypotheses

This study concerned with assessing the mediating effect of perceived relative advantage in the relationship between five exogenous constructs and an endogenous construct, intention to participate in voting using e-voting system. Accordingly, five mediating effects have been hypothesized, thus:

H_{14} Perceived Relative Advantage (RA) of e-voting system mediates the relationship between perceived trialability (TRB) and voter's intention to participate in elections using e-voting system (ITP).

H_{15} Perceived Relative Advantage (RA) of e-voting system mediates the relationship between perceived observability (OBS) and voter's intention to participate in elections using e-voting system (ITP).

H_{16} Perceived Relative Advantage (RA) of e-voting system mediates the relationship between perceived ability to use (PATU) and voter's intention to participate in elections using e-voting system (ITP).

H_{17} Perceived Relative Advantage (RA) of e-voting system mediates the relationship between trust in the technology (TIT) and voter's intention to participate in elections using e-voting system (ITP).

H_{18} Perceived Relative Advantage (RA) of e-voting system mediates the relationship between computer self-efficacy (CSE) and voter's intention to participate in elections using e-voting system (ITP).

b. Results of Mediating Effect

In mediating analysis, Vinzi (2013) stressed the importance of reporting the total effects (i.e., the sum of direct and indirect effects between two constructs) for more complete picture of the mediating constructs including the cause-effect relationships. Furthermore, to determine the sizes of mediated or indirect effect, two robust but often-underutilized methods were identified (Jose, 2013). The methods yield to same results in basic linear regression, thus a*b or c – c′. According to Jose, a*b method entails multiplying 'a' by 'b' to obtain the indirect effect.

This study therefore, adopt Zhao et al. (2010) and Jose (2013) criteria to assess both the mediating effect of perceived relative advantage of e-voting including and strength of the relationships between exogenous variables (TRB, OBS, PATU, TIT and CSE) and endogenous variable (ITP). Nonetheless non-significant direct effect of computer self-efficacy on ITP, we proceed to test mediating effect of perceived relative advantage in the relationship between computer self-efficacy and ITP in accordance with criteria explained by (Hayes, 2009; 2013) who rebutted the fallacy of establishing significant association of X and Y as a condition for testing mediation effect.

As stated in the previous section, this section presents results of the PLS bootstrap regarding the mediating effect of perceived relative advantage of e-voting system in the relationship between perceived trialability, perceived observability, perceived ability to use, trust in the technology, computer self-efficacy and intention to participate in voting.

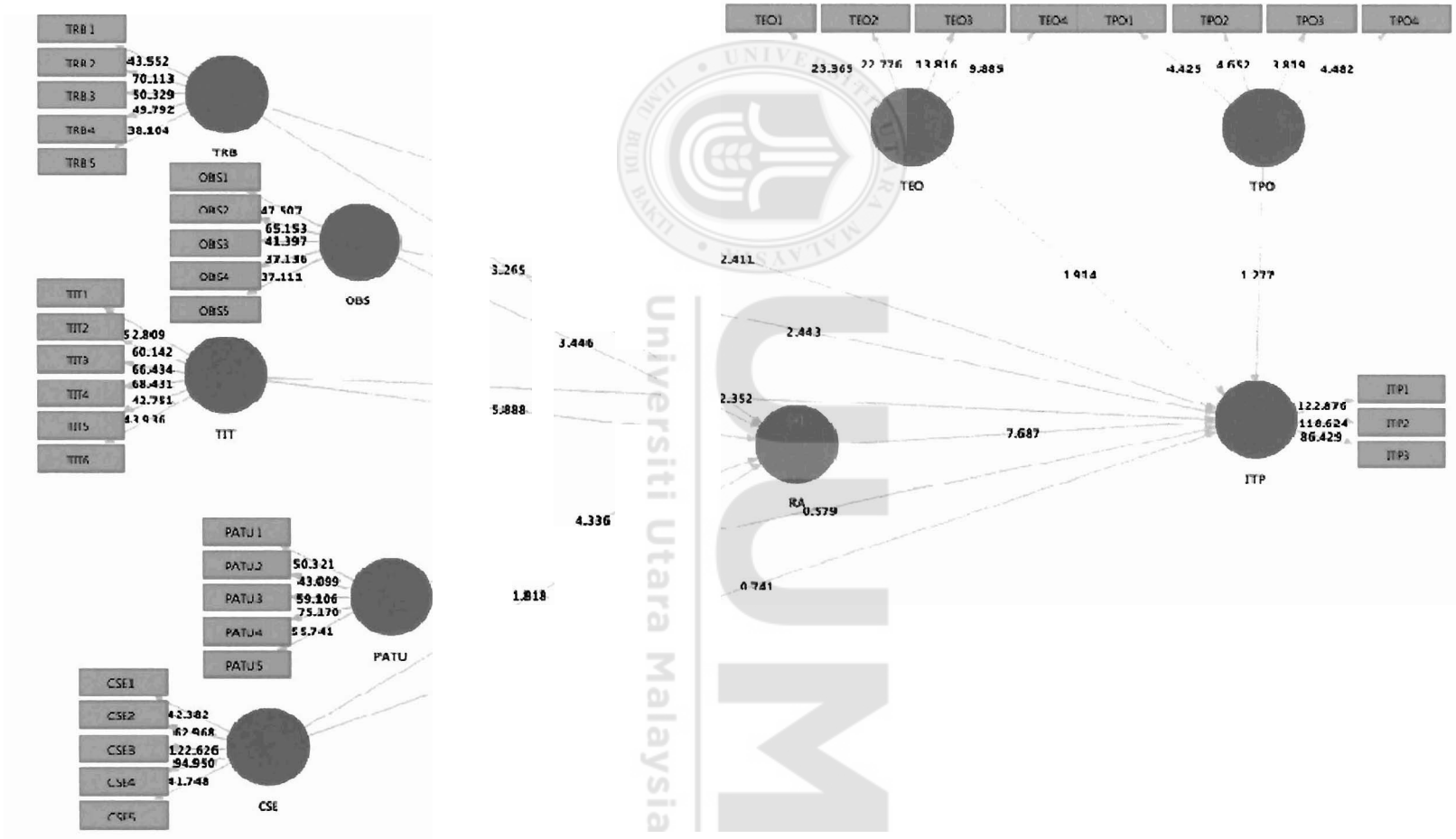

Figure 5.4. Model of e-voting adoption

Table 5.13

Results of Mediating Relationships (Indirect)

H_0	Relations	a*b β	S Mean	St. Error	t value	Decision
H_{14}	TRB -> RA -> ITP	.080**	.081	.024	3.35	Supported
H_{15}	OBS -> RA -> ITP	.097**	.099	.034	2.83	Supported
H_{16}	PATU -> RA -> ITP	.078**	.080	.021	3.69	Supported
H_{17}	TIT -> RA -> ITP	.134**	.136	.029	4.60	Supported
H_{18}	CSE -> RA -> ITP	.034*	.035	.020	1.72	Supported

Note: ** Significance at $p < .01$
* Significance at $p < .05$

Indicated in Figure 5.4 and Table 5.13, pictorial and tabular representations of the results of mediating analysis respectively. The results demonstrated that all the five hypothesized mediating relationships have proven to be statistically significant. Four of the five relationships have demonstrated strong statistical evidence at $p < .01$ while one relationship has indicated significance at $p < .05$, validating mediating effect of perceived relative advantage of e-voting system as determinant of intention to participate in voting using the system. Specifically, the results have demonstrated strong mediating effect of perceived relative advantage variable on the relationship between perceived trialability and intention to participate at $p < .01$ ($\beta = .080$; $t = 3.35$); perceived observability and intention to participate at $p < .01$ ($\beta = .199$; $t = 4.52$); trust in the technology and intention to participate at $p < .01$ ($\beta = .199$; $t = 4.52$) and perceived ability to use and intention to participate at $p < .01$ ($\beta = .199$; $t = 4.52$). Mediating effect of perceived relative advantage variable on the relationship between computer self-efficacy and intention to participate was positively significant at $p < .05$ ($\beta = .199$; $t = 4.52$).

It is equally important here to report changes in the total effect of two variables (Trust in the Electoral Government Officials and trust in politically elected government officials) on intention to participate in voting after mediating effect analysis for more complete picture of the model.

Table 5.14

Results of Total Effect

Relationship	β	S Mean	St Error	t – value	p – value
TEO -> ITP	.077	.074	.040	1.91	.028
TPO -> ITP	.074	.067	.058	1.28	.101

Initially, main effect of trust in the electoral government officials and trust in politically elected government officials variables on intention to participate was statistically significant as reported (Table 5.6; and Figure 5.2). Observing the relationships among the variables as a complete model, indicative in Table 5.13, the path coefficient between trust in the electoral government officials and intention to participate slightly decreased from the baseline model (β = .086 to –.077; and t = 1.97 to 1.91) but maintain significant positive relationship at $p < .05$. Furthermore, previous analysis of the main effect of trust in politically elected government officials on intention to participate was significance at (β = .113; t = 2.03, $p < .05$). In contrast as a model, trust in politically elected government officials has no significant influence on intention to participate however maintained positive coefficient (β = .074; t = 1.28, $p > .05$). The R^2 value for the model also increases from .455 to .460.

c. Direct Effect path c'

Zhao et al. (2010) argued that strength of mediation is measured by the size of the indirect effect, but not by the lack of the direct effect as claimed by some scholars (Baron & Kenny, 1986). Instead, presence of the direct effect suggests alternate mediators (Zhao et al.). We therefore conducted path c' analysis in accordance with Zhao's et al. suggestion.

Table 5.15

Results of Direct Effect path c'

Direct (path c')	β	S Mean	St Error	t – value	p – value
TRB -> ITP	.101*	.103	.042	2.41	0.008
OBS -> ITP	.142*	.142	.058	2.44	0.007
PATU -> ITP	.030^{ns}	.028	.052	0.58	0.281
TIT -> ITP	.136*	.129	.058	2.35	0.009
CSE -> ITP	.030^{ns}	.030	.040	0.74	0.229

Note: * indicates level of significance at $p < .01$
^{ns} indicates non-significance

Having conducted the direct and indirect effects analysis, Figure 5.4 is a pictorial representation of the analysis whereas Table (5.11, 5.12 and 5.15) displayed the results of causal indirect effect path a, indirect effect path b and direct effect c' respectively. Regarding indirect effect for path a, the results demonstrated strong significant positive causal indirect effect of four of the initial five hypothesized relationships at $p < .01$ whereas one path demonstrated significance relationship at $p < .05$. Specifically, strong significant causal indirect effect are shown between perceived trialability and perceived relative advantage ($\beta = .185$; $t = 3.27$, $p < .01$); perceived observability and perceived relative advantage ($\beta = .224$; $t = 3.45$, $p < .01$); trust in the technology and perceived relative advantage ($\beta = .310$; $t = 5.89$, $p < .01$); and perceived ability to use and perceived relative

advantage (β = .195; t = 4.674, p < .01) whereas path between computer self-efficacy and perceived relative advantage (β = .068; t = 1.633, p < .05) demonstrated significance at 5%. Hypotheses H8, H9, H10, H11 and H12 are therefore fully supported.

Table 5.12 displayed the results of the indirect effect for path b. Similarly, the results demonstrated strong positive causal association between the mediating variable perceived relative advantage of e-voting system and the dependent variable, intention to participate in voting using the system (β = .433; t = 7.69, p < .01), validating hypothesis H13.

Concerning path c', three paths nonetheless controlled mediating variable, maintained significant relationship, thus perceived trialability and intention to participate (β = .101; t = 2.41, p < .01), perceived observability and intention to participate (β = .142; t = 2.44, p < .01), and trust in the technology and intention to participate (β = .136; t = 2.35, p < .01). Two paths however demonstrated positive but non-significant effect, thus perceived ability to use and intention to participate (β = .030; t = .58, p > .05) and computer self-efficacy and intention to participate (β = .030; t = .77, p > .05). The results therefore suggest potential additional mediator(s) for the first three paths accordingly.

5.8 Coefficient of Determination (R^2 value)

It was suggested that a good parsimonious model is the one with high R^2 value explained by relatively fewer exogenous latent variables. The model being studied comprise of eight exogenous latent variables with moderate R^2 value of .54 in accordance with the classification by Hair, Ringle and Sarstedt (2011) and Henseler, Ringle and Sinkovics (2009) that R^2 value of .75, .50, or .25 can be labeled as substantial, moderate and weak

respectively. Evaluation the value of R^2 for the endogenous constructs requires observing the changes after omitting a specified exogenous construct.

5.9 Effect Size (f^2)

We calculated the effect size (f^2) to enable us determine the degree to which individual exogenous latent variable contributes (amidst other exogenous latent variables) in a relationship with an endogenous variable(s). In so doing, we determine the degree of significance or non-significance of existence of a phenomenon of interest in the population.

As illustrated in the Table 5.16, using Cohen's criteria, the f^2 value for each exogenous latent variable was therefore calculated by observing changes in the value of R^2 when a specified exogenous variable was consciously omitted from the model. Specifically, a formula $f^2 = \frac{R^2included - R^2excluded}{1 - R^2included}$ was used. However, despite difficulties in determining acceptable range of effect size, Cohen (1988) described f^2 values of .02, .15 and .35 as small, medium and large effect size respectively.

Table 5.16

Effect Size for Individual Variables based on Cohen (1988)

Var	f^2 value	Effect Size
Perceived Relative Advantage (RA)	.174	Medium
Perceived Trialability (TRB)	.017	None
Perceived Observability (OBS)	.020	Small
Perceived Ability to Use (PATU)	.001	None
Trust in the Technology (TIT)	.017	None
Trust in electoral officials (TEO)	.009	None
Trust in elected officials (TPO)	.008	None
Computer Self-efficacy (CSE)	.001	None

The results of the f^2 for the individual endogenous latent variables indicated that f^2 value for perceived relative advantage and perceived observability are medium and small at .174 and .20 respectively while the remaining six variables have varied insignificant effect size.

5.10 Blindfolding and Predictive Relevance (Q^2)

Closely related with f^2 value, the cross-validated redundancy measure is a recommended assessment criterion (Wold, 1982) that can be used to assess model's predictive accuracy – (Q^2) (Geisser, 1974; Stone, 1974). The Geisser-stone Q^2 value can therefore be used to assess the predictive relevance of a model (Hair, Sarstedt, Pieper, & Ringle, 2012). Predictive relevance in PLS-SEM entails accurate predictions of the data points of indicators in reflective measurement models of endogenous constructs and endogenous single-item constructs.

However, Q^2 value does not apply to formative endogenous constructs. In the structural model, particular reflective endogenous latent variable can said to have predictive relevant if its Q^2 values is greater than zero (Hair, Hult, Ringle, & Sarstedt, 2014, p 178). SmartPLS beta blindfolding procedure was applied to obtained Q^2 value for the endogenous construct of this study being a single-item constructs. The Q^2 value for endogenous single item construct for this study, intention to participate in voting using e-voting system is .44. By this value, it is assertive that the model being studied has substantial predictive relevance.

5.11 Summary

This study developed and validated a model of voting participation using e-voting system that hypothesized mediating role of perceived relative advantage of e-voting in the relationship between technological attributes and trust in the technology and computer self-efficacy of the voter. The model explained 54% variance of voting participation using e-voting system with substantial predictive relevance of .44.

We statistically analyzed the mediating relationships in the proposed model by first checking direct effect between the independent variables and the dependent variable, between the independent variables and the mediating variable between the mediating variable and the dependent variable and then for mediating effect of perceived relative advantage in the relationship between the hypothesized independent variables and the dependent variable.

Paths that demonstrated significant positive relationships in the model comprised of mediating effect of perceived relative advantage in the relationships between (1) perceived trialability and intention to participate; (2) perceived observability and intention to participate; (3) perceived ability to use and intention to participate; (4) trust in the technology and intention to participate; and (5) computer self-efficacy and intention to participate. Direct effect of trust in the electoral government officials on intention to participate was supported while direct effect of trust in the politically elected government officials on intention to participate demonstrated positive but not significant. Table 5.17 below presented a summary of the findings of the hypothesized relationships.

Table 5.17

Summary of Hypothesized Relationships and Findings

H_0	Hypotheses	Findings
H_1	Perceived Trialability of e-voting system (TRB) positively influences voter's intention to participate in public elections using the technology (ITP).	Supported
H_2	Perceived Observability of e-voting system (OBS) positively influences voter's intention to participate in public elections using the technology (ITP).	Supported
H_3	Perceived Ability to Use (PATU) positively influences voters' intention to participate in public elections using e-voting system (ITP).	Supported
H_4	Trust in technology (TIT) positively influence voter's intention to participate in public elections using e-voting system (ITP).	Supported
H_5	Trust in Electoral Government Officials (TEO) positively influences voters' intention to participate in public elections using e-voting system (ITP).	Supported
H_6	Trust in Politically Elected Government Officials (TPO) positively influences voter's intention to participate in public elections using e-voting system (ITP).	Not Supported
H_7	Computer Self-efficacy (CSE) positively influences voters' intention to participate in public elections using e-voting system (ITP).	Not Supported
H_8	Perceived Trialability of e-voting system (TRB) has direct positive effect on perceived relative advantage (RA) of the technology.	Supported
H_9	Perceived Observability of e-voting system (OBS) has direct positive effect on perceived relative advantage (RA) of the technology.	Supported
H_{10}	Perceived Ability to Use e-voting system (PATU) has positive effect on perceived relative advantage (RA) of the technology.	Supported
H_{11}	Trust in technology (TIT) has direct positive effect on perceived relative advantage (RA) of the technology.	Supported
H_{12}	Computer Self-efficacy (CSE) has direct positive effect on perceived relative advantage (RA) of the technology.	Supported
H_{13}	Perceived Relative Advantage (RA) of e-voting system has significant positive impact on voter's intention to participate using the technology (ITP).	Supported
H_{14}	Perceived Relative Advantage (RA) of e-voting system mediates the relationship between perceived trialability (TRB) and voter's intention to participate using e-voting system (ITP).	Supported

H_0	Hypotheses	Findings
H_{15}	Perceived Relative Advantage (RA) of e-voting system mediates the relationship between perceived observability (OBS) and voter's intention to participate using e-voting system (ITP).	Supported
H_{16}	Perceived Relative Advantage (RA) of e-voting system mediates the relationship between perceived ability to use (PATU) and voter's intention to participate using e-voting system (ITP).	Supported
H_{17}	Perceived Relative Advantage (RA) of e-voting system mediates the relationship between trust in the technology (TIT) and voter's intention to participate using e-voting system (ITP).	Supported
H_{18}	Perceived Relative Advantage (RA) of e-voting system mediates the relationship between computer self-efficacy (CSE) and voter's intention to participate using e-voting system (ITP).	Supported

CHAPTER SIX

QUALITATIVE DATA ANALYSIS

6.1 Introduction

Previous section dealt with presentations and analysis of quantitative data. Presented in this section, a step-by-step procedure of qualitative data analysis. On this segment, data collected from face-to-face interview were thematically analyzed. Subjective data notwithstanding, validity and reliability of the instruments were discussed. Using Nvivo analysis, qualitative data were analyzed and discussed. This chapter also discussed inferences, summary and conclusions of the qualitative information.

6.2 Interview Protocols

The researcher developed interview protocol that provides background information including explanation on the purpose of the study, rights and consent of the interviewee, places to record the interview and the preliminary questions used in the interview. The interview protocol guide was adoption in accordance with Creswell (2012) and Lodico, Spaulding and Voegtle (2006). Presented below a brief guidlines while a detailed protocol is annexed at Appendix C.

i. Obtaining consent from the interviewee to participate in the study.

ii. Choosing a quiet, suitable place for conducting the interview.

iii. Having a planned questions but flexible during the interview.

iv. Commencing the interview by personal reintroduction.

v. Reminding the participant of the confidentiality of his or her responses.

vi. Recording the interview data using audio tape and note taken.

vii. Obtaining general descriptive information.

viii. Striving for neutrality and nonjudgmental reactions.

ix. Using effective probes to obtain additional information.

x. Being courteous when the interview is over.

6.3 Data Analysis

The qualitative data analysis aspect of this study involves a systematic and logically rigorous description and representation of non-variable concepts or simple nominal-level variables including general ideas, themes, or concepts. Giving that a technique other than use of quantitative or statistical analysis is to be used, content analysis was optimized. The content analysis for this study was according to the steps mentioned below.

a. Pre-interview

At personal level, the researcher approached various potential interviewee individually based on the understanding of the prevailing customs of the community. Individuals were contacted directly at homes, at places of occupations and on the streets. At institutional level, official letters for approval were dispatched to the relevant institutions. Some of the steps of pre-interview include:

b. Seeking Consent of Potential Interviewee

Having mainly two categories of participants consisting private individuals and institutional officials, two sorts of permission were improvised, thus:

i). Individual potential voters: The researcher explained the purpose of the research, and provided details description of the methodology and design. Also provided, informed consent form, and sought for written consent to participate in the interview that would last for about 30 minutes. The interviewees were then asked to suggest convenient time and together with the researcher, venue for the session is agreed upon. The researcher also made available to the interviewees, semi-structured interview questions for rehearsal.

ii). Electoral officials and political parties: The researcher wrote officials letter to the chief executive of the INEC and the All Progressive Congress (APC) and Peoples' Democratic Party (PDP) Political Parties in the selected States. Accompanied with the letter, relevant document backing the research, consent form as well as details description of the purpose and methodology of the study. The letter sought for approval to conduct interview with selected staff of the organization. In addition, through physical interaction, the researcher explained the content of the letter and entertained questions asked by the officials.

c. Interviews and Data Management

The interview session began by choosing quiet location with minimal distractions. Then the researcher conducted one-on-one interview during which the participants were asked open-ended predetermined questions and other probing questions to elucidate information. The responses of the interviewees were audio taped and note taken the context. After the

interview, the participants were requested for audience for ratification of views expressed and in the event, any need arises, and hence; personal contact information of the participants was documented.

The audio taped responses were later transcribed into text in what Krueger (1994) called transcript-based analysis. Having transcribed the interviews, Hausa versions were translated into English using black and white translation with the assistance of two linguists, holders of master in linguist with one of them major in Hausa and the other major in English. In circumstances where response was not articulated and clear, the researcher follow-up with the interviewee for clarification. Figure 6.1 below depicted stages of interview adopted.

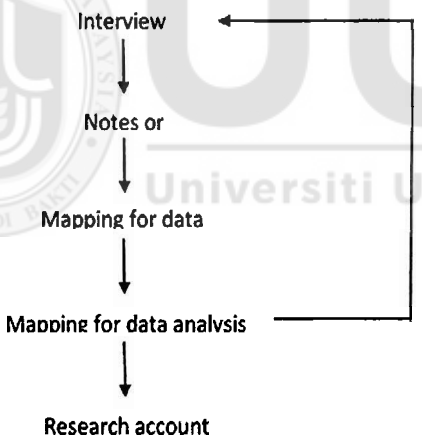

Figure 6.1. Interview and data management stages
Adopted from Cassell, Catherine, Symon and Gillian (2004)

The above Figure diagrammatically represents the highlight of stages involved in the data collection, management and reporting. It can be observed, at mapping for data analysis

stage, the researcher reached back to the interviewee(s) for further clarifications and or ratification of ideas and expression.

d. Coding Procedure

The researcher began the analysis by coding the transcribed data to discover patterns from the bulk amount of text. The researcher adopt coding procedure in accordance with Auerbach and Silverstein, thus relevant text, repeating ideas, themes, theoretical constructs, and theoretical narrative. Using queries in Nvivo qualitative analysis software, the data were coded based on the themes emerged. Through careful regrouping, related themes and sub-themes were assigned to broader domains.

e. Reporting

It is pertinent to note that in reporting the views of the participants, we tried to present as original wordings of the participants as possible. However, where necessary, the researcher made some unavoidable editing in terms of punctuation, spelling, and faltering which may affects the readability of the text and may confuse the reader (Bloor, Frankland, Thomas, & Robson, 2001). Equally important to note, the researcher only constructed, identified discourses and discursive practices and pattern for readers to interpret. In reporting, juxtaposing and laying approaches were adopted. We tried to contextualize the account of participants' views, by providing clue of the context to the readers.

6.4 Demographic Data

The study analyzed account of selected interviewees across potential voters, electoral officials and party officials. Presented in Table 6.1 summary of demographic information of the interviewees whereas detail of demographic data of the interviewees is annexed at appendix D.

Table 6.1

Summary of Demographic Information of the Interviewees

Interviewee	Frequency	Percentage
Category		
Voters	15	60%
Electoral Officials	6	24%
Party Officials	4	16%
Gender		
Female	6	24%
Male	19	76%
Age		
Young Age (18 – 30)	7	28%
Middle Age (31 – 45)	13	52%
Older Age (46 and above)	5	20%
Educational Qualification		
Lower Qualification	14	56%
Higher Qualification	11	44%
Residence		
Rural	10	40%
Urban	15	60%
Income		
Low Income	17	68%
High Income	8	32%
Computer Literacy		
No Computer Skills	6	24%
Basic Computer Skills	12	48%
Advanced Computer Skills	7	28%

6.5 Factors with Potential Implications to Impose Decrease in Voter Turnout in a Drive to Adopt e-Voting System in Nigeria

The third objective of this study is aimed to explore factors with potential implication to impose decrease in voter turnout in a drive to adopt e-voting system in Nigeria. This section presents thematic accounts of interviewees concerning the objective. Through the steps of analysis outlined above, the themes emerged were categorized into broader themes, themes and sub-themes as represented in the Figure 6.2.

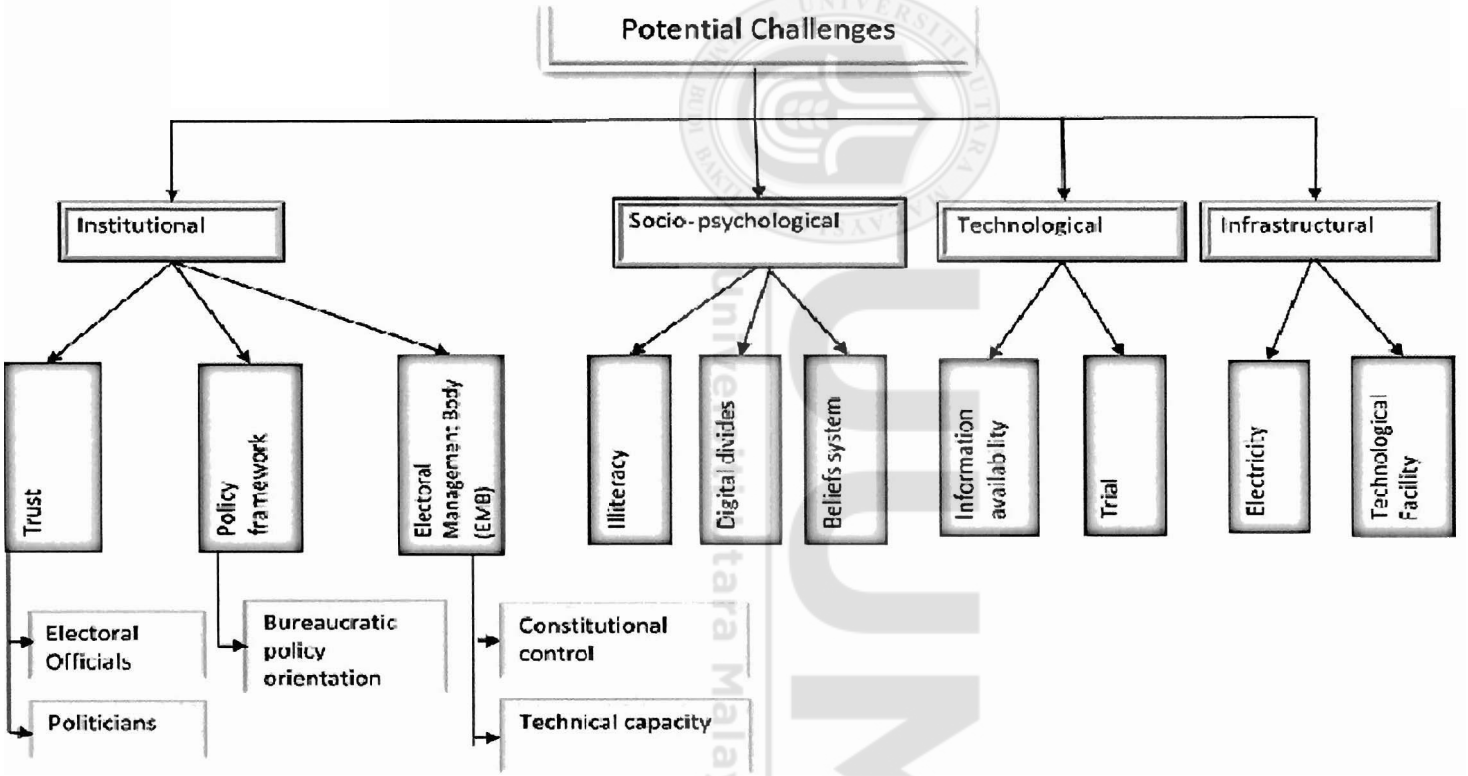

Figure 6.2. Qualitative model of factors influencing voter cognitive decision to participate in election using e-voting system

In accordance with the themes emerged, summary of ideas/views of interviewees about the objective of the research is provided. At this stage, the themes developed are backed with narrations from the interviewees using their own words as much as possible. This in essence, serves as a bridge between the objective of the research and the interviewees' subjective views and ideas.

6.5.1 Institutional Factor

Institutional factor is a broad theme emerged after we considered merging several related themes concerning democratic institutions idenitifed to have potential implications of imposing decrease in voter turnout in a drive to adopt e-voting system. Some of the themes merged to form institutional factor include lack of trust in the government officials, bureaucratic policy orientation and weak electoral management body. Table 6.2 displayed descriptive statistic on the extent to which the respondents discussed the the challenging factor and its sub-themes.

Table 6.2

Response on Institutional Factor

	TEO		TPO		BPO		ConsC		TechC	
Category	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**
Voter	13	87%	8	53%	9	60%	3	20%	7	47%
E. Official	3	50%	4	67%	2	33%	3	50%	3	50%
P. Official	3	75%	1	25%	3	75%	2	50%	3	75%

TEO = Trust in the Electoral Officials; TPO = Trust in Politically Elected Officials; BPO = Bureaucratic Policy Orientation; ConsC = Constitutional Control; TechC = Technical Capacity

a. Trust in the Government Officials

Accounts of the interviewees support the quantitative findings concerning lack of trust and confidence in the government officials as a factor with potential implications of imposing decrease in election. The accounts resounding alleged involvement of the government officials in various act of fraud, rigging and other forms of electoral corruption. The denting records repudiate the reputation of the officials and hence, voter's fear that e-voting adoption may be another sophisticated technique of rigging elections unnoticed adding to high costs of voting. More than 85% of the voters and about 75% of the party officials including 50% of the electoral officials interviewed expressed concern about sincerity of the electoral officials in handling e-voting system as displayed in Figure 6.3.

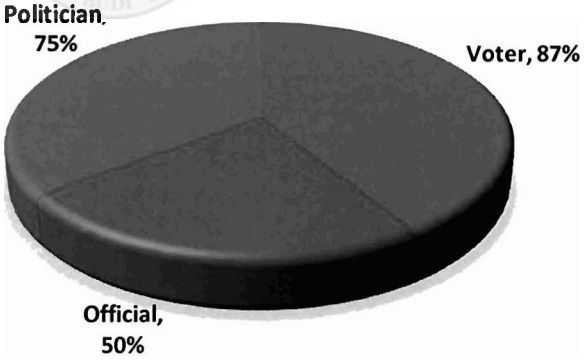

Figure 6.3. Response on trust in the electoral government officials

Sincere conduct of elections by the election managers accorded priority in making the electon credible compared to adopting a new voting system (e-voting). Adoption of e-

voting system can be constraint by the questionable sincerity and conduct of the electoral officials who are responsible for handling the system.

> *The likely challenges for using e-voting is the sincerity of electoral workers. They give the impression that they are neutral whereas they are serving the interest of some class* [of people], *doing as they are being instructed to do. Since e-voting technology has to do with central database using IT* '[information technology]', *it is even easier to inflate the results of the elections by simply adding a digit or something of that nature.* (Voter Interviewee 14).

In a similar narration, a female voter has linked reluctance to participate in election using e-voting to perceived partisan role of the electoral government officials.

> *. . . if the government officials are sincere in discharging their responsibilities from the top to bottom, citizens will easily accept government policies* [participate in voting using e-voting system]. . . *Officials who are entrusted with the responsibility of managing the election are seen to be liars, corrupt and agents of confusion. So whatever those officials may say,*[e.g. e-voting system is capable of addressing elections irregularities] *citizens don't want to believe in it thinking that it is business as usual* (Voter Interviewee 3).

It was suggested that citizens' propensity to participate in election using e-voting decrease when they lack confidence in the institution responsible for organizing the election (Avgerou, Ganzaroli, Poulymenakou, & Reinhard, 2007). Alleged involvement of electoral officials in various act of electoral fraud was given as justification for citizens' reluctance to participate in election using the proposed voting system. In line with ideas expressed by the voters, a Political Party Youth Leader is quoted saying:

> *We don't have confidence and trust in the electoral officials for some obvious reasons.* '[For example]', *recently after by-election was conducted in Anambra State, the INEC boss confessed that some of the electoral officials were caught and charged with various allegations of electoral malpractices. So we have reasons to be suspicious in the activities of electoral officials. How feasible even the method known to all citizens* [paper ballot system] *is not being handled effectively then abruptly transit*

> *to a method not known to them?* [e-voting system] (Party official Interviewee 4).

Confirming alleged complacency of electoral officials in electoral corruption, INEC boss, Jega admits ". . . we know that there are cases when some of our staff engaged in fraudulent activities . . . this is the reality despite our actions to change the situation" (Jega & Hillier, 2012, p 9). In addition, an outstanding critical challenge facing INEC is that of initiating strategies capable of boosting its performance and public confidence. "This presents a major problem, given that INEC faces a profound and widespread lack of trust in its work amongst election stakeholders" (Independent Electoral Assessment Team Final Report, 2010, p 1). e-Voting can only be an agent of increasing election participation in a circumstance when citizens have trust in the institution responsible for organizing the election (Avgerou et al., 2007).

b. Trust in the Elected Government Officials (Politicians)

In contrast to the quantitative findings, qualitative information hinted that lack of trust and confidence in the polticians may impose decrease in voter turnout on participation in a drive to adopt e-voting system. An interviewee's account reported that citizens' cynicism to participate in election using e-voting is attributable to deliberately creation of artificial political scenario by theelected officials in order to play dirty politics. Illustrated in Figure 6.4, statistical description of how the respondents discussed about Trust in Elected Government Officials.

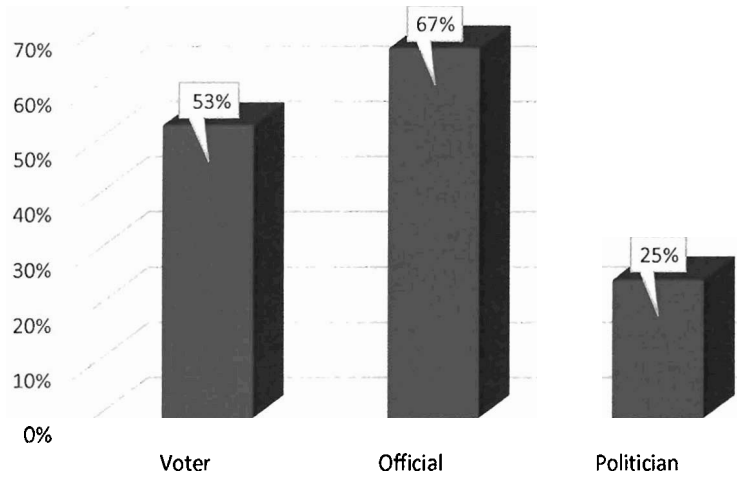

Figure 6.4. How respondents talked about trust in politicians

Voters and electoral officials alike expressed similar concern about suspicious activities of politically elected government officials. In a quoted narration, a female voter expressed fear of misusing position of trust by the elected government officials to breach the rules of the game.

> *I don't see any wrong with our existing method of election* [paper ballot method]. *The problem of Nigerian election is mainly attributed to greedy and self-centered politicians* '[elected government officials who are]' *seeking for power to rule and ride on people in order to loot public treasure.* '[Such]' *politician can use all the powers available to them to bend the rules of the election for their selfish interest be it manually or electronically . . .* (Voter Interviewee 11).

In a related development, the elected government officials have been accused of using excesses force to harass and intimidate perceived opponents in their beat to rig elections. In a quoted statement, a female voter expressed fear that the government officials may be aggravate corruptions and irregulaties in the electoral process by using electronic voting.

". . . [voters have] high level of distrust towards politicians and government to handle sophisticated technology such as e-voting" (Voter Interviewee 3).

Trust in elected officials is an essential ingredient for citizens' participation in elections using e-voting system. In contrast to the popular assumption that e-government initiatives in developing countries restore broken trust in government institution, perception of trustworthiness of e-government initiative such as e-voting is dependent of perception of citizen's trustworthiness of the government institutions responsible for the election (Avgerou et al., 2007).

c. Bureaucratic Policy Orientation (Traditional Top-Down)

Accounts from the interviewees revealed that citizens and political parties did not participate in the proposed e-voting policy process. Rather than participatory role, citizens are only considered as recipients of the policy outcome. Being not comfortable with the non-involvement, citizens are reluctant to accept the policy outcome either. Figure 6.5 presented the summary of the extent to which categories of the interviewees talked about bureaucratic policy orientation vis a vise participation in election using e-voting system.

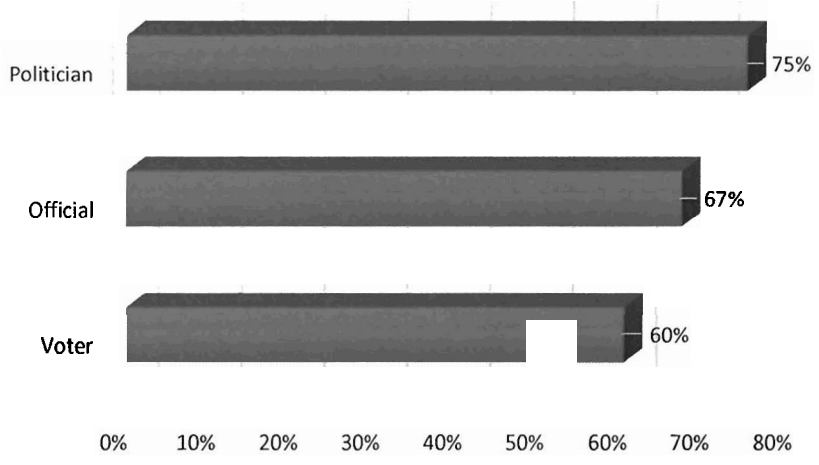

Figure 6.5. Interviwees discussion about bureaucratic orientation of the proposed voting policy

Evidence from the interviewees showed homogeneity of ideas of the voters, party officials and electoral officials about bureaucratic oriented nature of the e-voting policy. Voters and party officials' respondents narrated that the proposed policy is communicated to them via media. A Vice Chairman stated,

> *We are not aware neither been consulted about the proposed issue of e-voting technology adoption by the government. We just heard the news over the air that a voting system* [e-voting] *that is quite different from the one known to us and almost all the citizens of Nigeria* [paper ballot method] *is being proposed* (Party official Interviewee 2).

Augmenting the feeling of isolation, a voter added, "I read it over dailies that government is planning to introduce e-voting system in near future elections as a remedy to the shortcomings of the existing system" (Voter Interviewee 9).

In another narration, an Organizing Secretary provides an analogy of a bigger picture of policy process in Nigeria, describing it as elitist dreaming, imposition and selfish motivated.

> *. . . we have representatives at both Senate and House of Representative and they are supposed to be seeking for views and opinions of their constituents and wards members before making the* [e-voting] *policy. . . Unfortunately, the way our leaders enact policies is just a metaphor of a person that eat to his fill, enjoying sleep and begin to dream of imposing things on behalf of others. Nevertheless, in actual sense, it is intended to achieve selfish interest. . . We are not in support of the proposed e-voting system of election because it will bring backward to our democracy. It is better to allow our democracy to be matured enough . . . by the time our democracy is matured, government does not have to worry itself to impose e-voting because, citizens would initiate for the change themselves* (Party official Interviewee 1).

Majority of the party officials interviewees concur with the above expressed view. Confirming to the idea of 50% of the party officials interviewees, a voter expressed concern on the non-participatory nature of e-voting policy despite having direct bearing on citizens as end users. The voter expressed that non-involvement of citizens in policy process induces feeling of isolation and may impose decrease in voter turnout, thus

> *Unfortunately, in Nigeria, government is not consulting ordinary citizens before taking decision even if the decisions directly affect them. More badly, even the so-called political representatives who are mainly elected to represent the interest of their constituent members are not consulting the citizens from their constituents before taking major decisions in the respective chambers. In most cases, once they were elected, they desert their constituencies only to resurface on approach of another round of elections just to seek for votes. This is the reason why people ascribe Nigerian democracy as self and family representations* (Voter Interviewee 7).

In what seems to be testimony of non-involvement of other voting stakeholders such as voters and political parties in the policy formulation process, Head of Operations of INEC described the process as bureaucratic oriented that has not been subjected to public opinion.

> *We have not subjected e-voting policy to sampling public opinion. The electoral house realized the need for adopting robust method of voting. . . . Now that electronic voting is proposed . . ., people are apprehensive just like the time we were trying to use computers for the voters' registration. Many people were saying is not going to work. . . All of these today become history because, we were able to register people on the computers and*

> *produce more realistic voters' registration* (Electoral official Interviewee 5).

In congruence with the above expressed opinion, a Residence Electoral Commissioner added

> *The e-voting policy has not being formulated by the grass root. But that is not an issue because, the policy is formulated by the class that understand what the election is all about . . . we are working tirelessly to provide solution to all the complaints people are making against the voting system. Now that we have confident in the proposed e-voting as better option, but still people are making negative comments. In fact, we are expecting them to appreciate* (Electoral official Interviewee 1).

While lack of citizens acceptance of policy in Nigeria poses serious impediment to policy sustainability, e-voting adoption inclusive, bureaucratic policy orientation, which is more of traditional top – down policy formulation is identified as one of the major problem for voter turnout in a drive to adopt e-voting system.

6.5.2 Challenge of Credible Electoral Management Body (EMB)

Deduced from the account of the interviewees, two major challenges facing Nigerian electoral management body include poor legal framework to guarantee independence and financial autonomy and inadequate technical capacity to undertake sophisticated election technology such as e-voting.

a. Constitutional Control

Notionally, INEC is said to be independent body. In reality however, the constitution confer the power to appoint the head of the Commission and its finances on partisan president. Vulnerability of INEC to the control of partisan executive poses a question about

the Commission's independence and autonomy. The complexities precipitate perceptions that INEC in connivance with executive arm of government plan to introduce sophisticated voting system to the advantage of the incumbent government officials, and hence, a source to potential threat to voter turnout using the system. Figure 6.6 displayed response of the interviewees regarding how constitutional intricacies undermine the principle of neutrality and effectiveness of the INEC.

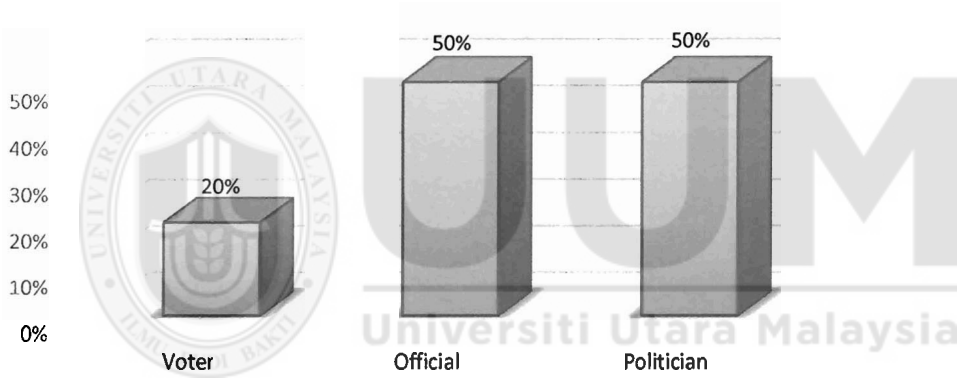

Figure 6.6. How respondent talked about constitutional control

Given the weak background of INEC in terms of independence and financial autonomy, half of the electoral officials and party officials; and few of voters' interviewees have expressed similar views concerning viability and neutrality of the Commission amidst of existing constitutional intrigue. Head of Logistics and Transport of INEC stated, "As I am talking to you, up till now government did not approve . . . funds for the procurement of the machines and the materials [required for e-voting]. . . . There really seems to be problems" (Electoral official Interviewee 3). His opinion affirmed the financial controlling

role of the government over the Commission. In a statement, he pleaded for timely release of funds by the government, a picture that depicted a boost to financial controlling role of government over the Commission.

> *INEC requires substantial budgetary allocation to organized credible elections. The funds are necessary for preparations such as procurement of the machines, materials, and training of personnel. The question is that does the government willing to release the required funds to procure all the needed facilities. I am appealing to the government to facilitate release of the required funds without which INEC cannot make any progress in its plan to use e-voting technology.* (Electoral official Interviewee 3).

A male voter of rural resident cast a serious doubt that whether INEC is truly independent

> *In fact, an argument that is going on is that whether INEC is truly independent or not. In essence, how autonomous is the INEC? We believe that the government appoints senior staffs of the Commission and the same government controls its funds. By controlling its appointment and funds, certainly the government can interfere in the activities of the Commission even with the e-voting* [system of election] (Voter Interviewee 7).

Worries regarding lack of financial autonomy undermining performance of the INEC are areas of serious concern to the bigger image of the Commission including its programs and policies. Citizens find it difficult to trust a Commission whom by their perception considered as mere appendage of the partisan presidency. A Women Leader of a Political Party stated,

> *. . . factors threatening possibilities of implementing e-voting system in Nigeria is lack of adequate funding . . . facing INEC as the electoral empire. The body is said to be independent Commission, but its source of revenue has always been from the federal government. So, in reality it is more or less an extension of the presidency* (Party official Interviewee 3).

The cumulative effect of weak institutional base ranging from lack of citizen trust and confidence in democratic institutions, ineffective policy framework, inadequate devolution of constitutional powers and responsibilities pose great challenge to voter turnout nevertheless, e-voting adoption.

b. Technical Capacity

Technical capacity of INEC staff to handle electronic voting system is a factor with potentials of imposing decrease in voter turnout in a drive to adopt e-voting system. How adequate the Commission has skillful staff to handle e-voting system raise a lot of concern among citizens and other election stakeholders. A female voter has this to say

> *I have a fear that INEC has no* [skilled staff with the] *capacity to handle sophisticated technology such as e-voting. The Commission is grossly understaffed to an extent it has to be employing ad hoc staff to do the job using the regular method* [paper ballot]. *Then how can such ravage Commission attempt to introduce a method it cannot handle* (Voter Interviewee 11).

Incapacitation of INEC to handle e-voting system is lamented by Head of Human Resource, INEC who is quoted saying ". . . the major barriers on the side of INEC is inadequate skilled manpower to handle the technology. Staffs are yet to be trained on how to handle the proposed technology" (Electoral official Interviewee 6). The Head debunked the the notion of INEC lacking staff strength but skilled stressing further, "People are insinuating that INEC has no adequate staff to handle e-voting system of election. . . INEC has enough staff that could be trained to handle e-voting technology" (Electoral official Interviewee 6).

By implication, citizens' perception of the Commission's inability to handle sophistications of e-voting system is a potential threat to voter turnout. More time to learn about the technology is emphasized by a Youth Leader of a Political Party interviewee.

> *. . . such lack of readiness can be observed even among the officials themselves as they are not adequately trained to handle such technology. They required time to be adequately trained to handling the technology.*

> *Then what about ordinary citizens? Just imagine the contradiction* (Party official Interviewee 4).

It was further added that ". . . the capacity to the electoral officials to satisfactorily undertake such a huge sensitive task of e-voting system of election is not very certain" (Voter Interviewee 8). Partly due to ". . . obvious shortage of well trained personnel that can carry out the exercise efficiently" (Voter Interviewee 4).

Similarly, in its report of 2011 general election, INEC stated,

> *The sourcing of skilled personnel with basic IT skills for the Voter Registration exercise was a major challenge. When it became obvious that the presumption of IT knowledge for NYSC members was inadequate, the Commission had to develop quick guides and crash programs for the personnel before deployment* (INEC, 2011, p 43 – 44).

One factor with potential implications for imposing decrease in voter turnout in a drive to adopt e-voting system lies with the inadequacy of skillful personnel capable of handling the system. Going by the previous records, it has been a tradition of INEC to, on the eve of election periods; employ the services of ad hoc staff who often receive minimal training in order to serve in different capacities as electoral officials. A male voter with basic computer skills stated,

> *. . . inadequate resources persons who have the knowledge and skills to operate e-voting technology in Nigeria is very obvious. There are few number of people who have the knowledge and skills of computer, and Nigeria has over 170 million people with thousands of polling booths.* '[More so]', *there may also be databanks that require skilled computer personnel to manage repairs and make backups. The question here does INEC have the adequate work force to cover all the polling units and databanks in the country. Where are the work force? . . . due to inadequate staff, current practice shows that INEC utilize NYSC members as ad hoc staff during elections. The problem of inadequate work force of the Commission has not been improved to warrant switching* [transition] *to e-voting. Certainly, INEC needs adequate professionals to manage e-voting system of election* (Voter Interviewee 9).

Figure 6.7 presented summary of how the interviewees talked about technical capacity of the INEC to handle the proposed technology and how it subsequently affect voter turnout.

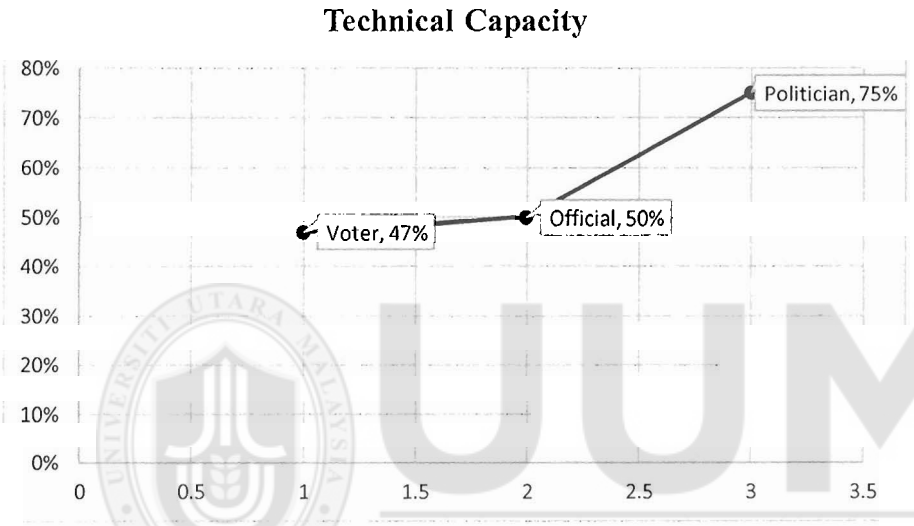

Figure 6.7. Descriptive statistics of respondents' discussion on technical capacity

6.5.3 Socio-psychological Challenge

Assessment of oneself ability to conveniently interact with the technology is a parameter citizens are likely to use in measuring their participation using e-voting system. From the account of the interviewees emerged the potential challenges of socio-psychological themes comprising of illiteracy, computer literacy, digital divides and belief systems as depicted in the model (Figure 6.2).

a. Illiteracy

Level of education distinguishes individuals' access to information, and in this case, election information including use of new voting system. Low level of education is a factor with potential implications to imposing decrease in voter turnout in a drive to use e-voting in Nigeria considering large percentage of illiterate citizens who can neither read nor write. An illiterate voter may likely abstain from participation if he/she perceives having inadequate information or knowledge about the proposed voting system. A rural resident voter with advanced computer skills responded,

> *. . . problem facing e-voting implementation is the high level of illiteracy in the country. With large percent of the voting population who cannot read or write, it is difficult for them to appreciate and use computers for voting. Then, how INEC intends to tackle this problem is not yet known. . . . there should be a certain level of literacy a country attained before a project such as e-voting can be introduced so as not to disenfranchise voters* (Voter Interviewee 12).

Ability of the voter to read and understand simple instructions is emphasized as the requirement for voter turnout using e-voting system, lack of which pose a decrease in participation as expressed by a female voter,

> *. . .Just normal basic skills of reading and writing; identifying words and figures are the basic skills needed by a voter to use e-voting* [system]. . . *voters have to identify which button says what, which button says vote, which one says this or that options. They have to identify candidates by their pictures and names including names of the parties . . . it's simply about knowing basic words and figures* (Voter Interviewee 13).

Another voter participant of low educational qualification is quoted saying:

> *Illiteracy level in Nigeria is high, so adoption of e-voting system initiative would require adequate time, enlightenment and training if we are to achieve success. Lack of which could lead to low participation in the elections most especially by the illiterate citizens who constitute the majority of the society* (Voter 2).

Opinions stressed level of illiteracy in Nigeria as a factor with potential implications of imposing decrease in voter tunout in a drive to adopt e-voting. Similarly, literature emphasized knowledge-based nature of e-voting requiring some level of literacy for citizens to participate (Avgerou et al., 2007). Figure 6.8 displayed statistical description of how respondents discussed about illiteracy.

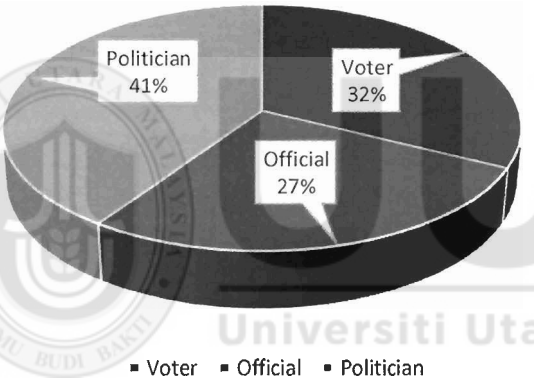

Figure 6.8. How respondent talked about illiteracy

b. Computer Literacy

In conformity with the quantitative findings, citizens with low computer skills may likely feel incompetent to interact with computer related technology and therefore, may not appreciate e-voting system of election. The consequent of the voter despair may impose abstention from participation. Vast majority of interviewees from voters and party officials categories expressed concern that inadequate computer literacy is likely to deter

participation in election using e-voting system. In contrast, views expressed by the electoral officials repute the idea of inadequate computer literacy imposing decrease in voter turnout.

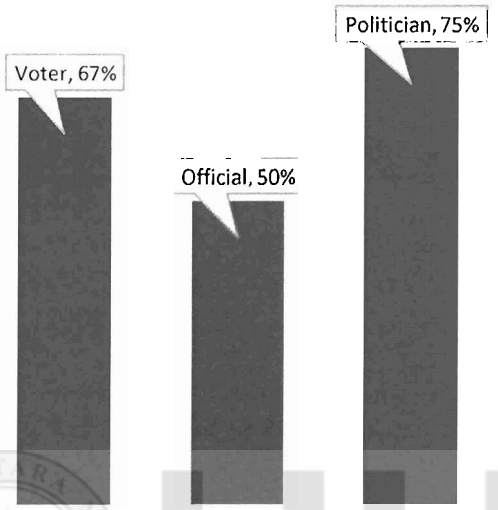

Figure 6.9. How respondent talked about computer literacy

Figure 6.9 illustrated statistical summary of how the respondents' talked about computer illiteracy as a factor with potential implications for imposing decrease in voter turnout in a drive to adopt e-voting system. It is worth noting that voters and party officials have homogenous views while electoral officials hold divergent views. ". . . another . . . barrier to acceptance of e-voting technology is inadequate computer literacy in the country" (Voter Interviewee 5). A female voter is quoted saying

> *When e-voting is mentioned as per as I am concern, is just about using computers in elections. Now it is pertinent to ask what percentages of Nigerians have computer skills. You see, very insignificant percentage! And does it implies that the larger percentage of citizens without computer skills will be disenfranchised or simply inconvenienced?* (Voter Interviewee 3).

Perceived low computer literacy is threatening participating in election using e-voting system as expressed by a male voter,

> . . . *looking at the percentage of citizens in Nigeria that can operate computer, if e-voting system is to be introduced, I think voters' turnout can even go down because, it is not everybody that can be able to operate it* [e-voting] (Voter Interviewee 10).

By implication, lack of computer skills can cause psychological and or emotional anxiety when interacting with unfamiliar computer related technology such as e-voting. Computer anxiety is associated with negative perceptions about computers, problems when interacting with them, and avoidance of the computer related technology (Igbaria & Iivari, 1995). Computer anxiety has potential negative implication of inposing decrease in voting participation using e-voting system as stressed by a male voter of rural resident.

> *Most citizens are full of fear and apprehension of the technicalities required to use e-voting system of election . . . it will not encourage citizens' participation as majority are scary and might not attempt to go to the polling station to cast their votes* (Voter Interviewee 15).

Nigeria is characterized with poor state of ICT sector that is manifest in lack of quality work force as large portion of the country's population lack essential computer literacy (Adeyinka & Olasina, 2012). Attempt to impose e-voting might implicate stigmatization and consequent decrease in participation among less technology savvy (Svensson & Leenes, 2003).

c. Digital Divides

e-Voting adoption is likely to inconvenience a large number of voter population residing in rural areas who are less technology savvy when compare with elites citizens in urban centers.

Table 6.3

Descriptive Statistic of Respondents' Discussions on Digital Divides

Digital Divides		
Category	**Freq**	**%**
Voter	7	47%
E. Official	1	16.7%
P. Official	3	75%

As an emerging concept, a Women Leader of a Political Party participant added that e-voting adoption is capable of entrenching the existing digital divides of the rural-urban dichotomy. The Women Leader mentioned,

> *Government should be sensitive to the repercussion of imposing e-voting technology on citizens. The proposed method required citizens to be computer literate and for that reason, it will not in any way, encourage participation. Rather, it will scare people to avoid election completely. Presently, how many citizens are computer literate even in the urban cities not to talk of rural areas? Many people just hear the name of computer but never seen or touch it. Many people are afraid of computer and therefore cannot use it in election* (Party official Interviewee 3).

Failure to critical assessment of socio-economic development and problematization of developing countries as a requisite for transfer of technological initiatives from the developed world often implicated frustration in the drive for the realization of ICT-mediated development (Avgerou, 2008).

The likely chance of citizens living in urban cities to have better exposure to voting innovation and in turn increase chances of their voting participation as compare to rural dwellers is high (Adeleke, 2015; Tolbert & McNeal, 2003). Therefore, e-voting may exacerbates the existing digital divides in election participation using e-voting system between rural and urban people.

> *. . . it is very difficult to use e-voting technology in Nigeria because majority of the electorates are living in rural communities without necessary education, skills and awareness to use e-voting. . . we are objecting introduction of any complex method of election until our development improves* (Party official Interviewee 1).

In conformity with the quantitative proposition, psychological belief in one self-ability to interact with computer, computer self-efficacy will enable citizens interact with computer related technology that can be a motivation to participate in election using e-voting system. Lack of computer skills is capable of decreasing participate in election (Chen et al., 2011). However, a twist in the perception to the rate of computer literacy in country could be observed by a number of participants who proclaimed that operating cell phone could be translated into computer literacy in a way. The insight is expressed in a quoted statement,

> *The issue of illiteracy in Nigeria is somehow over exaggerated. . . . Now people are used to computers through either direct use or indirect use. With . . . different sort of hand held telephones, you find out that even the remotest areas in Nigeria, people use such phones. . . keyboard that comes with such telephones is nearly the same with computer keyboard. Using . . . phones significantly improve people's knowledge and computer literacy. We should not confuse things just because people were not opportune to acquire formal education we are fun of tagging them as illiterates. . . It's very easy to operate e-voting as long as you can operate mobile phones* (Voter Interviewee 2).

In addition, another voter expressed similar idea stating,

> *A popular opinion is that e-voting technology can only be operated by the citizens who know how to operate computers and access internet. Luckily, enough for Nigeria, the coming of the communication gadget like BB, tablets, smartphones etc. has further provided Nigerians with these* [compter] *skills. So introducing e-voting in Nigerian election is a good news* (Voter Interviewee 14).

Traces showed divergent views about computer literacy. The interviewees had expressed no consensus on what constitute computer literacy and the rate of computer literacy in Nigeria. In contrary to the above opinion, a voter proclaimed a different window of idea on the notion of the rate of computer literacy in Nigeria. Nested in this opinion, cell phone

usage is considered a substitute for computer literacy as mentioned by the Head of Computer,

> *The proposed e-voting is not a rocket science. People are not expected to operate computers; . . . We are still having ignorant people who do not know how to use the manual system of election. . . . If someone do not know how . . . he should ask. It can be shown to him or her. It's not difficult . . . . . the proposed voting system is . . . just a matter of clicking ok, punch here, insert your card and the card inserted. . . if people are going to Mecca or Jerusalem, they are asked to make e-passport which is almost similar procedure, e-voting is rather simpler* (Electoral official Interviewee 4).

Greater part of the responsibilities of electoral officials is to ensure voting technology that reduces voting fraud, strengthen political participation, and inclusion by simplifying voting system (Avgerou et al., 2007).

d. Beliefs System

Trustworthiness of e-voting is a function of positive attitude of the society towards the use of ICT, and that citizen with negative predisposition of ICT might not have perceived trustworthiness of government-mediated initiatives (Avgerou et al., 2007). Table 6.4 depicted descriptive statistical summary of interviewees' discussion on belief system.

Table 6.4

Descriptive Statistic of Respondents' Discussions on Beliefs System

Beliefs System		
Category	**Freq**	**%**
Voter	5	33%
E. Official	1	16.70%
P. Official	2	50%

Citizens by their nature find it difficult to accept change as a rural resident voter with higher qualification was quoted,

> *Change is the most difficult thing going by the attitude of Nigerians. People find it difficult to accept change from the usual way they carry out things. They always want to maintain the status quo because they believe in the status quo while nursing fear of uncertainty in the outcome of the change* (Voter Interviewee 12).

Citizens' fear of uncertainty in the e-voting system can also be attributed to the societal disposition to belief system. In some part of communities, democratic process has not been accorded any importance. A male voter of urban resident and without formal education stated, "They [citizens] consider voting as mere periodic rituals without any meaning. . . ." (Voter Interviewee 8). Instead, the idea that has gained ground among some citizens in northern Nigerian communities in particular is that democracy is an imposition of western political system contravening societal sociopolitical values and heritage. Another voter without formal education but of urban residential status is quoted saying,

> *Already citizen's participation in electoral process is diminishing day by day. Imposing the use of e-voting system in the election will only add to the existing decrease in voters' participation especially in northern Nigeria where many people considered democracy as an imposition of western ideology and therefore distasteful* (Voter Interviewee 5).

Transformation to modernity through ICT mediated initiative cannot be treated in isolation from the sociopolitical and economic realities of the societies (Maiye & McGrath, 2008). In view of a drive to increase participation through e-voting adoption, socioeconomic, cultural and political antecedents of the developing societies are potential parameter that can be explored for successful integration of e-voting as panacea to decrease in voter turnout.

6.5.4 Technological Challenges

Given the newness of the technology in Nigerian election context, themes emerged from the account of the participants under the broad category of technological challenges include inadequate information about procedural operation of the proposed voting system and trialing the system.

a. Inadequate Information about the Proposed e-Voting System

Unavailability of information about the procedures involved in the operation of the proposed e-voting prompted citizen cynicism, raising lots of question regarding the sincerity of the proposal. Thus, capable of implicating decrease in voter turnout. Figure 6.10 has shown the summary of respondents' discussion on inadequate information about the proposed voting system,

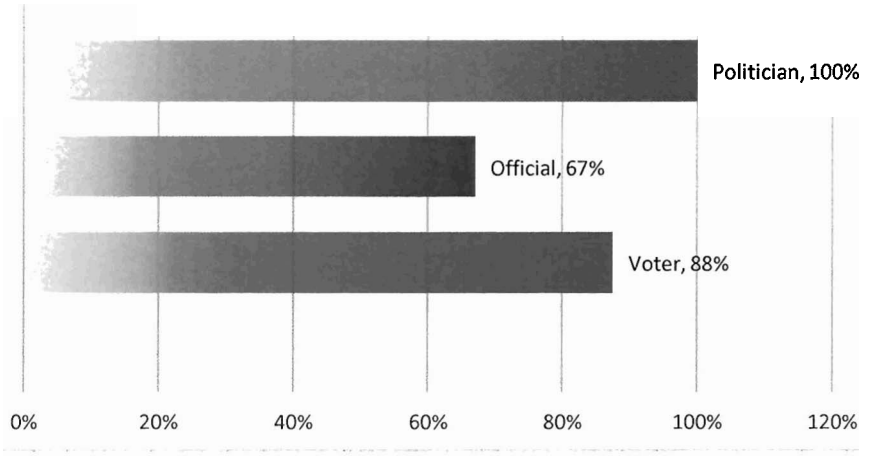

Figure 6.10. How interviewees discussed about inadequate information about the technology

A female voter of low educational qualification and without computer skills category stated ". . . as of now citizens don't know what e-voting is all about. We need to be informed of all the procedure involved in using the technology" (Voter Interviewee 6). Similarly, a male voter of higher educational qualification and advanced computer skills added ". . . most of the voting age citizens are not aware of how the electronic voting machine works, nor how to operate it" (Voter Interviewee 4). A rural resident voter with basic computer skills stated ". . . I do not know what is required of e-voting and I don't know what constitutes stages of [voting using] e-voting. All I know using computers improve way of doing things" (Voter Interviewee 10).

Unavailability of the information regarding operational procedure of the e-voting system is a potential area of confusion and suspicion capable of threating election participation as stated by another female voter of urban resident.

> *There is a big confusion about the proposed e-voting system adoption because the procedure of using the technology is not available. People are left uninformed, in dark making lots of guessing. My expectation is that the procedure is going to be different from the manual. It likely involves placing one's finger on the machine to read, accredit and possibly display options of contestants and or automatically generate a voting card. It is really going to be hectic job that requires rigorous procedure than the manual method* (Voter Interviewee 11).

Availability of information about the e-voting system allows citizens to evaluate the operational steps involved including difficulties or otherwise of using the system. Making information about the proposed e-voting system available and accessible influence voter trust and confidence in the system and eventual participation. A voter of rural resident and without computer skills stated,

> *For now we don't have full idea of what constitute e-voting system of election to enable us carefully assess it. We have never use it, never seen it*

> *and for us to trust it is a rush to taking decision. We need to experiment it in order for us to give it valid assessment* (Voter Interviewee 2).

In a similar opinion, Youth Leader of a Political Party with basic computer skills further lamented the implication of inadequate information about of the procedural operation of the proposed system as it affect voter turnout, describing it as a tale,

> *It is a joke or rather tale to think of using e-voting technology in this coming election. As the election is fast approaching, the procedures about operations of the proposed method are yet to be known by the citizens. We are not well informed of its procedures. In fact, we are out of the picture. We do not know those things entails in using computers in elections. It is only when we know those things that we can believe that certainly; it is difficult for someone to commit electoral fraud* (Party official Interviewee 4).

Furthermore, a segment of electoral officials expressed similar views in what brings about homogeneous views of all the category of the participants comprising voters, electoral officials and party officials regarding negative implications of inadequate information about procedural operations of the proposed e-voting system on voting participation. Head of Operation of INEC has mentioned,

> *If people understand . . . how to vote using the e-voting machine then there wouldn't be any problems. But if people don't know . . . how to use the technology to cast their votes, then there will be problems* (Electoral official Interviewee 5).

A Residential Electoral Commissioner supports the opinion "There is no doubt that citizens are not well educated about the new method of election" (Electoral official Interviewee 1).

b. Trialing the Technology

In what seems absolute, from Figure 6.11, the entire voters and party officials categories and 50% of the electoral officials emphasized that lack of adequate piloting of the proposed

voting system can implicate negative consequences on voter turnout. On the other hand, piloting the proposed voting system in non-national election for long period would enhance citizens' participation in election using the system.

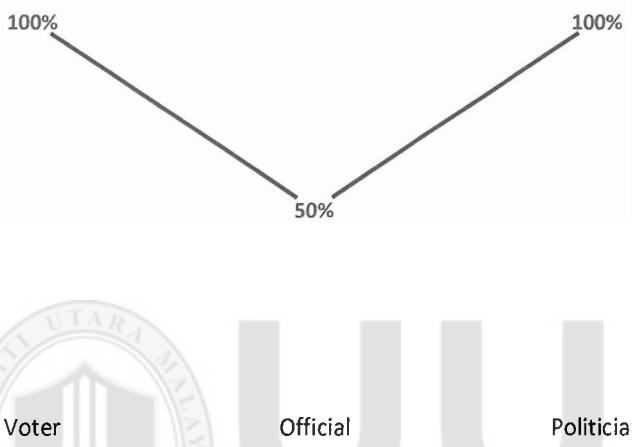

Figure 6.11. Descriptive statistic of respondents' discussion about trialing the technology

In this regard, a female voter from low educational qualification attributes voter trust in the e-voting system to a length of time taken in making trial of the system. She stated, "We also need to practically test the technology. It is only when people understand the stages involved that they can develop trust in it" (Voter Interviewee 6). Augment the idea, a male voter from higher income and qualification category stated,

> *. . . government . . . needs to demonstrate level of sincerity and test run the technology before adopting it at the national election. People are reluctant to accept it because it has not been test run for people to clearly see it working. This is the reason for people being apprehensive and pessimist about it. But if it is test run, identified the problems and the challenges, improve on them would enable people to observed its effect, which would make them willing to accept it. People would always accept innovation after they might have observed its effect* (Voter Interviewee 4).

Lack of testing the proposed e-voting system long enough non-national election or simulation is a major source of citizens' apprehension and consequent reluctant to participate in election using the system.

6.5.5 Infrastructural Challenge

Infrastructural challenges involved requisite technological and non-technological facilities. Technological facilities include internet broadband, computer accessibility including affordability while non-technological facility concerns with adequate electricity supply.

a. Requisite Technological Facilities

Avgerou (2008) highlighted that inadequate resources, dearth of facilities, lack of political commitment, poor maintenance culture, technological and functional degradation are among the major problems of sustainability failure of information system in the developing countries. In conformity, larger percentages of our participants across all the three categories lament poor condition of requisite technological facilities as depicted in Figure 6.12.

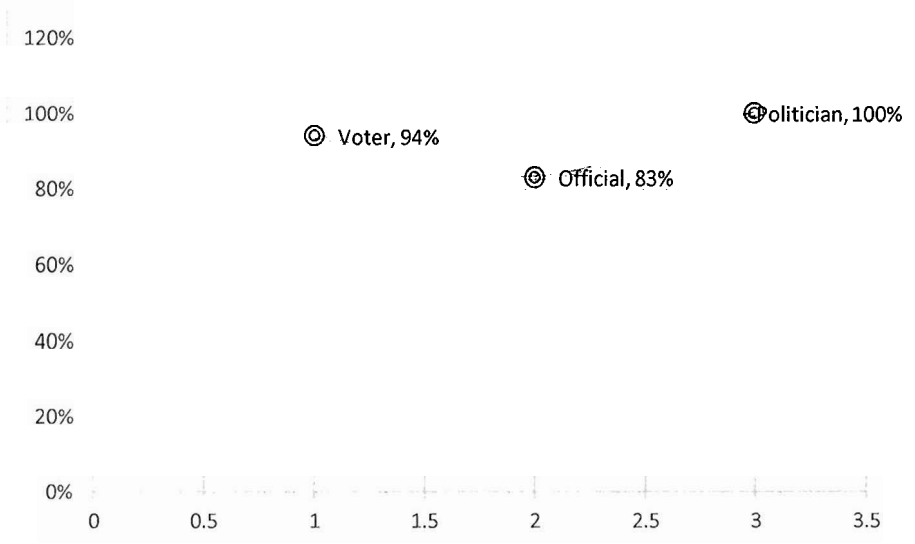

Figure 6.12. Summary of how respondents discussed on requisite facilities

In line with the above, Women Leader of a Political Party laments poor state of socioeconomic development of Nigeria to support election participation using e-voting system.

> *I am telling you that government official in power . . . always distance themselves away from ordinary citizens by their policies and actions. The government officials . . . know pretty sure that the state of socioeconomic development of Nigeria does not attain a level of using e-voting technology* (Party official Interviewee 3).

Specifically, poor state of requisite technological facilities such as internet is posing psychological despair on citizen. A point of worryto citizens is why government is not interested in making basic technological facilities available, accessible and affordable to citizens but rush to introduce voting system that requires high level of technological skills? An urban resident voter with higher educational qualification mentioned,

> *Accessibility to internet facilities is another big question that demand answer before introducing e-voting system of election in Nigeria. In Nigeria, internet is still seen as luxury. Most citizens are not having access*

> *to internet facilities. To my expectation, the benefits of introducing e-voting system of election could be achieved if votes cast are transmitted electronically using internet. Then without access to internet facilities to many people and places, how are we going to achieve the benefits?* (Voter Interviewee 9).

Extant literature has conformed to this view stressing that failure of ICT project such as e-voting system in developing countries can be attributed to dependency on foreign aids donors whereas a genuine development is the one that evolves from the available local capabilities and competencies (Odedra-Straub, 1993). An urban-based Youth Leader of a Political Party with higher income status pointed out eminent poor state of socioeconomic indices to support increase participation using e-voting system.

> *. . . Looking at the level of our socioeconomic development, one will arrive at the conclusion that* [Nigeria] *is not up to the level of using e-voting technology. With the abundance of wealth and resource, Nigeria supposed to be advanced than the state it is now but the wealth is in the hand of very few corrupt officials . . .* (Party official Interviewee 4).

A complementary view by Organizing Secretary of a Political Party with average income status cautioned that development beyond the realm of citizens' socioeconomic standard of leaving could be retrogressive. He stated,

> *Development should be according to people standard of living, education and exposure. In Nigeria, citizens' standard of living is very low. People are scampering for food to survive. The best thing to do is to perfect the existing method, sanitizing it from all irregularities and ensure the winners reflect the votes cast* (Party official Interviewee 1).

Development of ICT infrastructure and facilities is a foundation for e-democracy to thrive (Majekodunmi, 2013). However, governments of most developing countries are fun of deploying hyper-technology without requisite structures and facilities (Maiye & McGrath, 2008). The irrationale is capable of implicate loss of citizen trust and confidence in the democratic instittutions thereby imposing decrease participation in election.

b. Electricity Supply

Beside technological facilities, dwindling electricity supply is a source of apprehension about government commitment to deploy sophisticated technology that required uninterrupted electricity supply, and therefore potential factor that influence citizens' trust in the sincerity of electoral institution in particular and the government in general. Figure 6.13 provided a summary of the extent to which participants discussed about electricity supply as it affects voter turnout in a drive to adopt e-voting system.

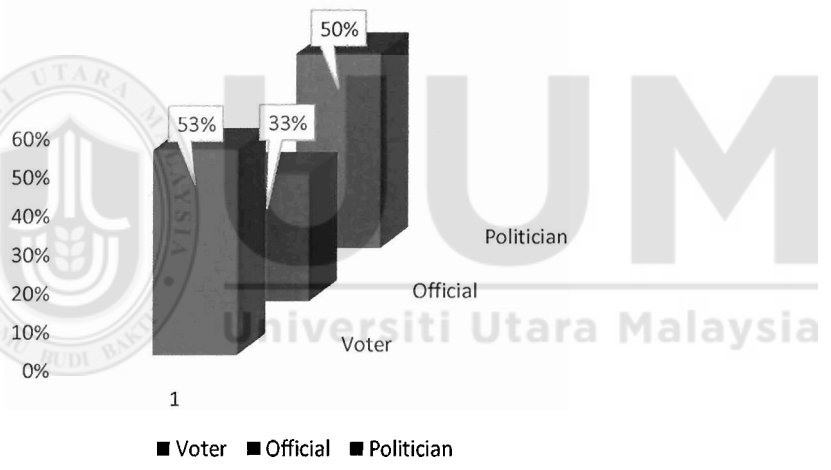

Figure 6.13. Summary of response about electricity supply

A male voter with higher education, average income and urban resident expressed dismay by the poor state of electricity generation and distribution in Nigeria and the the issue has the potential for imposing decrease in voter turnout using e-voting system.

> *Electricity shortage can be a problem of e-voting system of election. Currently Nigeria is generating less than four thousand (4000) Megawatts of electricity with a population of over 170 million. As we are talking now several villages have never been connected to electricity in their history. Places that are connected to electricity hardly get supply for good three hours in a day. Therefore, how would the Commission intends to manage*

> *and make use of its computers and other accessories to conduct electronic voting?* (Voter Interviewee 9).

Furthermore, a statement of another male voter of rural resident support the idea of electricity being a challenging factor "Likely challenges of using e-voting [in elections] may be . . . inadequate supply of electricity . . ." (Voter Interviewee 5). A female voter pinned down challenge of e-voting adoption on the epileptic electricity supply in the country drawing personal experiences including instants happening. She stated,

> *The challenges are . . . unsteady and inadequate power supply . . . You can see what I am talking about! As I am talking to you, my hand-held phone just went off because of unsteady power supply. Just little time before now, I was searching for internet but could not access it for an hour. Then if ordinary internet could not be accessed, how possible government adopts e-voting technology? What a joke! Nigeria is still far from such dream until we are ready to face the reality* (Voter Interviewee 13).

Inadequate diagnosis of requisite infrastructure often lead to failure of most government IT mediated development initiatives such as e-voting (Maiye & McGrath, 2008). Successful adoption of e-voting as a panacea to decreasing voter turnout in Nigeria to some extend is contingent upon addressing the issue of electricity supply. It was found that citizens in some part of the developing countries prepare manual means of communication over e-government initiatives due to fear of e-barriers to participation and unavailability of requisite technological infrastructure (Oreku & Mtenzi, 2012).

6.6 Remedy to the Problems of Decrease in Voter Turnout in a Drive to Adopt e-Voting System

The fourth objective of this study is to highlight remedies to the challenges of decreasing voter turnout in Nigeria. Various accounts of the interviewees pointed different layers of remedies to decrease in voter turnout in Nigeria. Some of the identifies measures include

harnessing effective participation of all stakeholders in the policy process, empowering anti-corruption agencies to enforce anti-corruption laws, stringent anti-corruption laws, absolute autonomy and independence of electoral management body, effective information dissemination strategy, incremental implementation of technology, technological design and community policing. Figure 6.14 displayed the layers of factors remedies to the challenging decrease voter turnout.

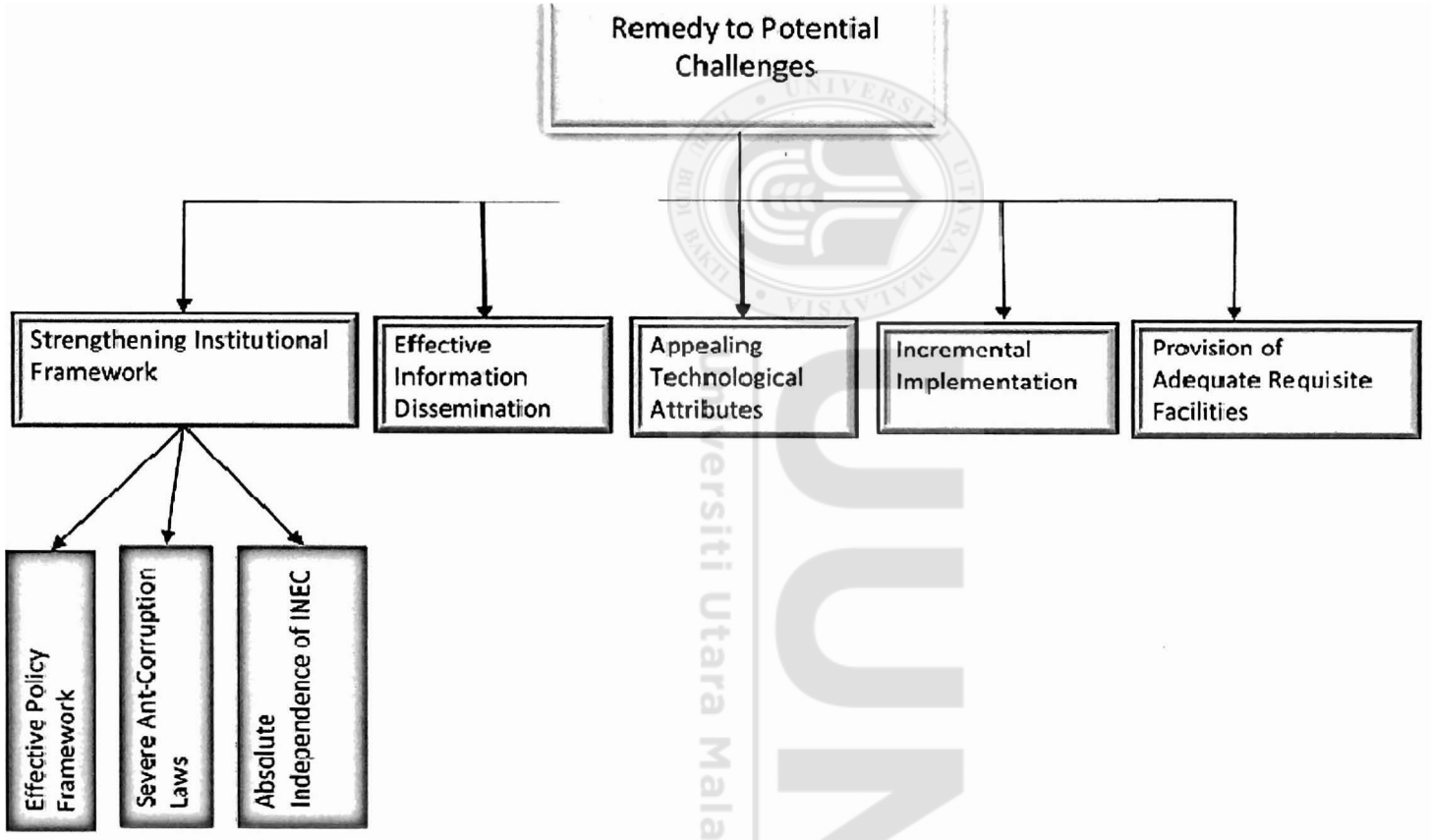

Figure 6.14. Hierarchical themes on the remedy to the challenging decrease in voter turnout

6.6.1 Strengthening Institutional Framework

The remedy to the institutional challenges of voter turnout in a drive to adop e-voting can be achieved through concerted interrelated measures that have been carefully synthesized from the opinions and ideas expressed from the interviewees and with support from the literature.

a. Effective Policy Framework

In the first instance, participation of all election stakeholders in the policy formulation and implementation of the technology could be a good starting point to address the seeming challenge of e-voting adoption. Figure 6.15 illustrated how the interviewees talked about effective policy framework.

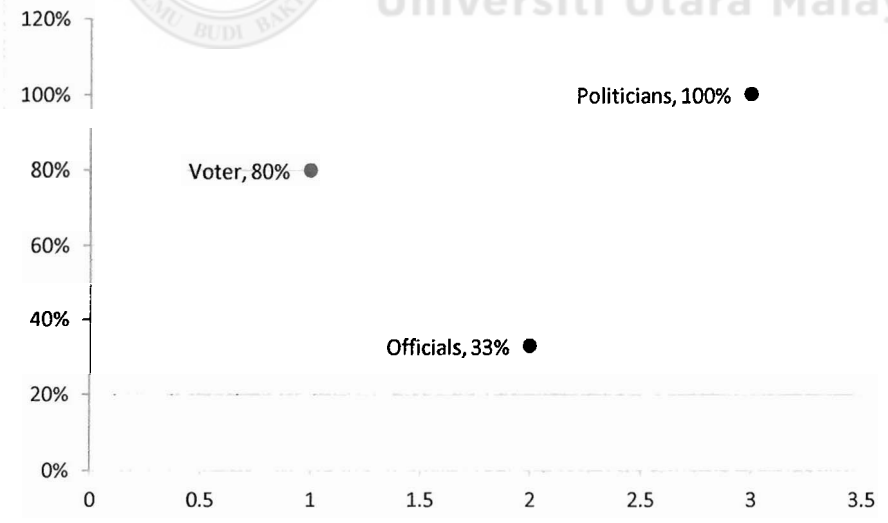

Figure 6.15. How the interviewees talked about effective policy framework

In this regard, a voter is quoted saying "We should all acknowledge that we are in democratic dispensation in which people should determine what it should be done and not some opportunist few individuals trying to impose their interest on citizens" (Voter Interviewee 5). By adopting a more inclusive participatory policy process, the notion of top-down imposition of e-voting may be overturned and consequently improve citizens' participation. Another voter added, "A sort of referendum could be set to obtain opinion of citizens regarding adoption of the technology . . ." (Voter Interviewee 12).

Additionally, all-encompassing and all-inclusion also known as bottom-up policy process is emphasized as a remedy to the challenging decrease in voter turnout in a quoted statement by a voter, thus

> *Government should always listen to citizens who are the users of the proposed technology and not the so-called classroom professionals. In most cases, the government just listens to classroom professional that has not gone to the field let alone understands the feelings, views and opinion of the citizens. Rather, government should utilize all avenues to obtain information from the actual users of the proposed technology and work according to their views and interest . . . Because those citizens at the grass root. . ., when consulted you will be surprise to see the kinds of useful options and opinions on best way to go about it* [e-voting adoption]. *If the government properly utilizes citizens' views and opinion, there shall going to be efficient and effective implementation of electoral system in the country* (Voter Interviewee 5).

Inclusive participatory policy process required input of all the stakeholders at every stages of the policy. Such policy process can yield sense of belonging and encourage participation. On corruption countdown, corruption can be tamed by strengthening capacity of the corrupting fighting agencies to enforce anti-corruption laws without fear or favor. Empowering anti-corrupt agencies is a good platform to regain citizens' trust and confidence in the technology mediated government programs.

> *I am advising the government to . . . fight corruption and the attitude of impunity. Doing that will resuscitate citizens trust and confidence in the government and its agencies (i.e. officials) and then e-voting can be introduced* (Voter Interviewee 9).

It can be seen from the foregone that strengthening policy framework especially by making it more participatory and inclusive will enhance citizens' confidence and trust in public decisions, which is in turn increase e-voting adoption.

b. Severe Anti-Corruption Laws

Nigerian politics is so deteriorating due to excessive corruption and impunity. Complementing institutional capacity can be achieved by promulgating stringent laws against corrupt practices and enforcing the laws.

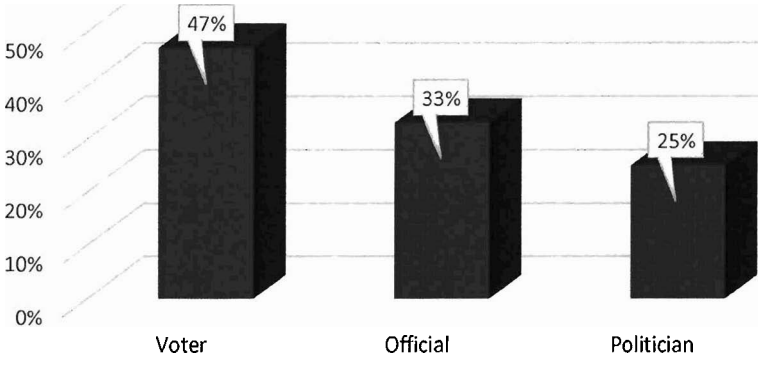

Figure 6.16. How the interviewees talked about severe anti-corruption policy

Stringent laws and equity in enforcing the laws will revive citizens' confidence in fair play politics and consequently encourage e-voting adoption. A voter stated,

> *. . . a legislation should be enforced to bar from contesting position, any candidates who use money for campaigning while any election workers found to have collected bride should be sentenced to life imprisonment . . . the only way that make politicians and the electoral workers to stay away from money politics* (Voter Interviewee 3).

According to the view express, enactment of stringent anti-rigging, anti-fraud and anti-corruption laws and indiscriminate application of such laws will serve as deterrence to ill-minded public officials from committing election related crime and consequently be a potential remedy for loss of citizens' confidence and trust in the electoral process in general and e-voting adoption in particular.

c. Absolute Independence of the Electoral Management Body

Closely related to strengthening anti-corruption agencies is absolute independence and financial autonomy of democratic institutions, particularly INEC. Absolute independence of INEC has reciprocate effect of citizens' trust and confidence in the ability of the Commission to deliver.

Table 6.5

Descriptive Statistic of Respondents' Discussions on Absolute Independence of the Electoral Management Body

Category	Frequency	Percentage
Voter	14	93%
E. Official	4	67%
P. Official	3	75%

A voter stated,

> *Changing method of voting will not solve the problems of elections in Nigeria. The only thing that will be a solution to the problem is for the government to grant INEC the necessary autonomy and financial independence that will enable it discharging its responsibilities diligently without fear or favor. It then left for the INEC to make provision for a simple voting method that citizens will enjoy* (Voter Interviewee 14).

Corroborating the above stated view, another voter stressed the financial autonomy as a condition of its effective performance of the Commission. "For the Commission [INEC] to be truly independent, its funds should be derived directly from the federation account and not through executive arm of government" (Voter Interviewee 6).

Affirming the preceding views, Head of Legal Department was quoted saying,

> *e-Voting can be encouraged by providing the necessary legislation and other backings including budget that enable the INEC to successfully organize the election using the technology* (Electoral official Interviewee 2).

Success and sustainability of government ICT mediated development in the developing countries hinges on the ability of the electoral body to institutionalize ICT drive/initiative as against the usual treatment of such programs as momentarily/trivial within a limited time frame. Institutionalization is a gradual journey.

6.6.2 Effective Information Dissemination

Effective information dissemination through electronic and print media, including social media would expose citizens to operational procedure of the technology and consequently provide solace to seeming fear and anxiety associated to use of the technology.

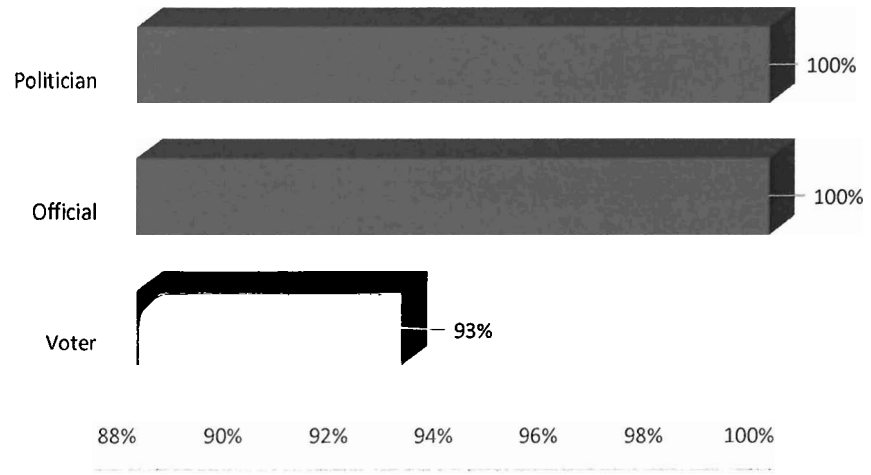

Figure 6.17. How the interviewees talked about information dissemination

A male voter with higher educational qualification and an advanced computer skills stated, "For the citizens of Nigeria to use e-voting, they need awareness, quality education and exposure to the technology . . ." (Voter Interviewee 9). In support of the view, a female was quoted saying, "The government should not rush into e-voting until and unless the basic requirements such as . . . enlightenment and creating awareness to electorates on how to operate the e-voting machine . . . are met" (Voter Interviewee 3).

Physical demonstration of operational procedure of the proposed e-voting would be add to the quality of information dissemination that would subsequently encourage acceptance of the technology as stated by a rural resident voter, thus,

> *One of the factors that can encourage voters to accept e-voting is providing information on how to use it in a manner people will understand. To do that government should ensure local citizens who understand language and culture of a particular community are drafted to provide demonstrations and other explanations on how to use the technology. . . posting people of different sociocultural background to demonstrate the use of e-voting will only amount to waste of time, energy and resources* (Voter Interviewee 7).

A multidimensional strategy for information dissemination involving all stakeholders would maximize accomplishment and accelerate diffusion. An electoral official of lower educational qualification and without computer skills stated,

> *. . . we call for voters' education, enlightenment and sensitization at schools and other public places. The work of sensitization does not rest on INEC alone but other stakeholders such as political parties. They should educate their members and supporters. Educated elites also have to create enlightenment among the public. This is the reason we call upon mass media, print and electronic to help in voters' education. Educate citizens about their right and overcome the influences of ignorant who are apprehensive of this good plan of e-voting* (Electoral official Interviewee 2).

Providing remedy to unavailability of information about procedural and operational procedure of the technology entail exploration of multidimensional strategies, and involving all stakeholders. Effective information dissemination can be viable remedy to perceive difficulties in interacting with the technology, and alleviate suspicion trailing the proposal.

Revitalizing the educational system to reflect the challenges of modernity is essential in order to tackle the challenges of illiteracy and problem of computer literacy. The educational curricula should be designed to enhance quality in both general literacy and in particular computer literacy. In line with this idea, Head of Computer stated,

> *For the citizens of Nigeria to use e-voting, they need awareness, quality education and exposure to the technology. . . If all these requisite facilities are provided, then let the voting be through internet where you can from the comfort of your bed cast your vote as obtainable in the developed world . . . There will be no development if there is no quality education. Without computer knowledge among average citizens, introduction of e-voting can be mal-development and a step backward to Nigerian nascent democracy, because; people will only be discouraged from participation* (Electoral official Interviewee 4).

Competence and culture of ICT adoption is not very common in Nigeria and that e-voting can be successful if it's built on the existing competence and propensity of the citizens to use (Adeyinka & Olasina, 2012).

6.6.3 Technological Attributes

Technological attributes such as perceived simplicity of the procedure, and easy to operate; language options, time saving, maximum security, privacy and confidentiality are good qualities of the technology that can encouraged adoption.

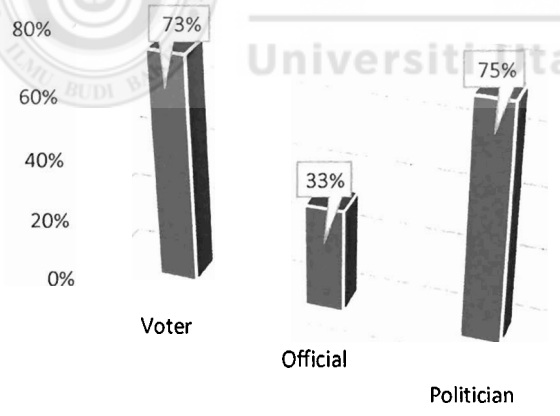

Figure 6.18. Summery of how respondents talked about technological attributes

When citizens perceived that the technology has edge advantages over the manual system of voting, they would like to adopt the technology and subsequently increased participation. Design of the technology should reflect the aspiration of the citizens. In this

regard, a voter highlighted perceived privacy, security and easy to operate as attractive attributes of the technology that can encourage adoption and canvass participation. A female voter with advanced computer skills is quoted,

> *Personally . . . e-voting would be the most appropriate method . . . considering privacy and sense of security the e-voting has . . . harder to highjack, easier to administer and to evaluate . . . many more hurdles will be eliminated by adopting e-voting system* (Voter Interviewee 11).

In line with the above opinion, a male voter stated ". . . convenience and privacy of the technology are convincing reasons to encourage citizens' participation" (Voter Interviewee 4). Moreover, a rural resident voter added, "time saving is another technological attributes capable of encouraging adoption . . . the technology can enhance good turnout if it reduces time taken to cast vote" (Voter Interviewee 15). Concerning the language option, a female voter from lower educational category with no computer skills stated,

> *. . . In Nigeria, we have four predominantly spoken languages consisting of Hausa, Fulani, Yoruba and Igbo. If the e-voting machine can be designed to be read in these four languages, it will be a break to the language barrier* (Voter Interviewee 6).

Issue of multiple voting is one of the most common criticism labelled against the existing manual system of voting. Perception of capability of the e-voting to addressing multiple voting can encourage citizens' adoption. To provide remedy to multiple voting, Head of Computer mentioned that: ". . . e-voting technology can provide opportunity to speed up election process, and going by its inbuilt mechanism of finger print, solve the problems of multiple voting" (Electoral officials Interviewee 4). Additionally, Head of Human Resource mentioned,

> *. . . e-voting system of election could help speed up the election process . . . ensures privacy of the voters, which in the case of Nigeria could also help ensure security. . . . eventually leads to reduction in human influence and*

> *by implication, citizens can vote for candidates of their choice without the usual harassment by political thugs. It will also leads to efficiency due to unnecessary delays and a cost saving investment* (Electoral official Interviewee 6).

Organizing Secretary conformed to the above expressed view, adding,

> *Adoption of e-voting is encouraging . . . it will ensure privacy of the voters . . . vote remains private and personal. . . avoid the crowded venues experienced during manual voting . . . enhancing your security, and time saving factor- faster than the manual method of voting* (Party official Interviewee 1).

Looking at the opinions expressed by the interviewees, perception of technological attributes such as perceived relative advantage of the technology, perceived ease of use, language variability can encourage citizen adoption of e-voting technology as suggested by technology adoption literature.

6.6.4 Incremental Implementation

Gradual implementation of e-voting system from simple to complex as a means to build citizens trust and confidence in the technology and in the capability of the electoral officials to effectively manage the technology should be pursue to the later. Invariably, gradual implementation of e-voting can be a remedy to fear of the technology arise as a result of lack of previous experience with the technology and volume of complain of not test running same.

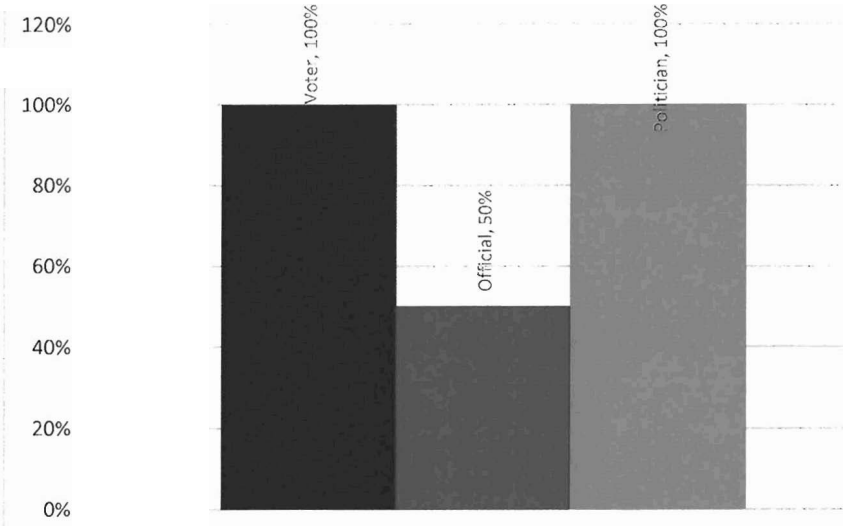

Figure 6.19. Summary of how the interviewees talked about incremental implementation

In addition, incremental implementation of e-voting can provide avenue to test the sincerity and capability of the electoral officials and eventually overturn distrust of the electoral officials. In line with the above proposition, a voter of 18 – 30 age bracket stated,

> . . . *regarding adoption of the technology* [e-voting] *first, in less important election. I said in less important election because, if referendum is to be obtained for the adoption of the technology in an important election like the national election, there might be disorder and chaos* (Voter Interviewee 7).

Incremental implementation of e-voting system will be a means of testing the technology that allows citizens to assess its suitability and other facilities required as stated by a 40 years and above age bracket voter,

> *Citizens may like to use the proposed technology after testing it to enable them ascertains its workability. Citizen may like to see whether server error will not be a problem, whether there will not be waste of time due to unskilled workers, whether electricity is not a problem and so on. In essence, citizens can accept the technology when government provides all the necessary equipment and facilities required* (Voter Interviewee 4).

Experimenting e-voting system in Nigeria will revive the lost confidence in the electoral official in managing the technology as pointed out by Women Leader,

> *. . . problem of trust in government can be overcome by experimenting the proposed e-voting technology and see how effective it is. Where lapses occurred, we improve on it. As a test run, we can use non-national elections or rather nonpublic election to test run the technology. For example, one quarter of the local government elections could be used to experiment the technology in order to observe effectiveness and feasibility of adopting it at the national election. It is unfortunate that we have not tested the technology and just attempt to adopt it in the national election. It is really a problem* (Party Official Interviewee 3).

Vice Chariman of a party of 31 – 40 year age bracket has expressed a similar opinion,

> *If the government have planned for the use of e-voting, long ago we should have been practicing it right from the period we started our democracy and by now we must have been perfected, citizens get educated and sensitized on how to use it and so on* (Party Official Interviewee 2).

In the opinion of Alliance for Credible Election (ACE), INEC has to consider many factors before introducing e-voting system of election. It cautioned against rushing, saying that "Electronic voting is the direction to go. However, INEC has to begin by piloting it. It is complicated. It must be localized . . . We must know the working processes of the machine" (Secretary ACE quoted from the "Nation Newspaper" 2012, March 4).

6.6.5 Provision of Adequate Requisite Facilities

Provision of requisite facilities is an essential indicator for government readiness to implement e-voting system. Facilities such as electricity supply, internet facility and accessibility can provides green light to the citizens on the commitment and determination of the government to adopt e-voting system.

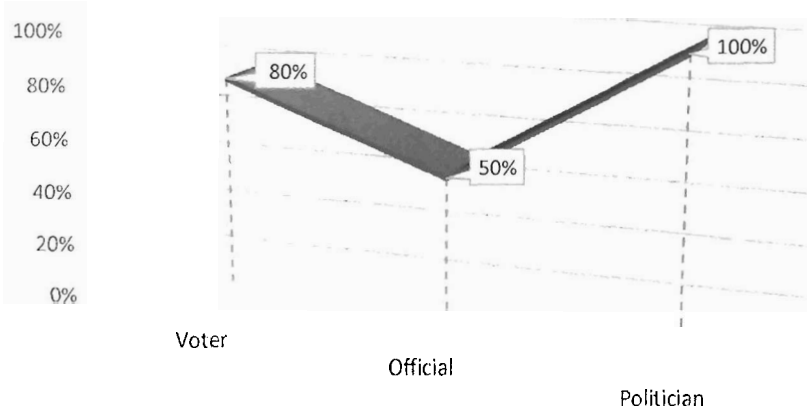

Figure 6.20. Summary of how interviewees talked about adequate requisite facilities

Research studies suggested that measures to increase citizens' participation in government initiatives include improving the quality of life, reducing the costs of communication and information facilities and bridging the digital divides (Jaeger & Thompson, 2003; Akman, Yazici, Mishra, & Arifoglu, 2005). On the internet facility and accessibility, an urban resident voter stated,

> *. . . as a requirement for e-voting technology adoption, the need for effective network coverage is uncompromising. But as at present, some areas in Nigeria are out of network coverage even for ordinary communication. Therefore, the feasibility of conducting election using e-voting technology is very slim* (Voter Interviewee 5).

Similar opinion was expressed by a rural resident voter,

> *It's only through adequate . . . provision of essential gadgets such as IT stuff, accessible internet and constant electricity supply can make e-voting technology a success. Once these facilities cannot be met, then e-voting technology adoption cannot be possible* (Voter Interviewee 10).

Furthermore, Alliance for Credible Election (ACE) caution regarding the standard of the facilities and their working condition before introducing e-voting system of election stating

that "You don't import abandoned and outdated technology from Brazil and China and flood the polling booths with them" (Secretary ACE quoted from the Nation Newspaper 2012, March 4).

Dwindling electricity supply as a potential challenge of e-voting adoption could be satiated by diversifying sources of energy to ensure various rural communities are efficiently connected to national power grid. In addition to the existing hydroelectric, exploration of other sources of energy such as solar, wind, biomass, nuclear, coal and gas would renew citizens' hope in the capacity of the government to implement e-voting adoption as suggested by a Vice Chairman.

> *Although, inadequate electricity can be a problem of e-voting adoption, the problem can be overcome by different options . . . Nigeria is blessed with sun and the world is so innovative that we can use solar panel in the areas where electricity is not available* (Party official interviewee 2).

Universal access to ICT facilities is an important condition for successful adoption of ICT mediated programs in electoral process (Majekodunmi, 2013).

6.7 Summary

This chapter dealt with presentation and analysis of qualitative data in line with research question three and four. The chapter presented interview protocol, steps of data analysis, demographic description of the participants and thematic analysis. Some of the themes emerged concerning potential challenges of citizens' participation in elections using e-voting system include institutional, technological and infrastructural challenges. On the other hand, strengthening institutional framework, effective information dissemination and

provision of adequate requisite facilities are some of the themes emerged as remedies to the potential challenges.

CHAPTER SEVEN

SUMMARY, DISCUSSIONS AND CONCLUSION

7.1 Introduction

The preceding chapter dealt with presentations and analysis of both quantitative and qualitative data in line with the study questions, objectives and within the purview by the extant literature. This chapter is organized to present the summary of the findings, discuss the major findings in the light of the premising literature and the implications of it to research and practice. It also provides direction for future research and finally offered conclusion.

7.2 Summary of Findings

The study is aimed to explore both qualitative and quantitative techniques to study participation in election using e-voting system in Nigerian context. Based on the research question one, the study proposed causal influence of seven exogenous variables (RA, TRB, OBS, PATU, TIT, TEO and TPO) on an endogenous variable intention to adopt.

In line with research question two, mediating role of perceived relative advantage of e-voting in the relationships between five exogenous variables (TRB, OBS, PATU, TIT and CSE) and an endogenous variable, intention to participate were proposed. In this regards, thirteen hypotheses were formulated and empirically tested. Based on the objective one of this study, the results revealed that six of the seven independent variables comprising of TRB, OBS, PATU, TIT, TEO and TPO were having significant positive influence on the

dependent variable, Intention to adopt. The findings supported hypotheses (H1, H2, H3, H4, H5 and H7) while computer self-efficacy is having positive but not significant relation with the dependent variable, intention to adopt, rejecting H6.

On the research question two, the five independent variables (TRB, OBS, PATU, TIT and CSE) were having significant positive relationship with the mediating variable, perceived relative advantage validating hypotheses H8, H9, H10, H11, H12 and H13. The findings also demonstrated mediating effect of perceived relative advantage in the relationships between TRB, OBS, PATU, TIT and CSE and intention to participate and hence, hypotheses (H14, H15, H16, H17 and H18) were fully supported.

The third objective of this study sought to explore factors with potential implications to imposing decrease in election in a drive to adopt e-voting system from the qualitative perspective. Amidst several challenging factors identified in the course of analyzing interviewed data, this study categorized them into broad perspective of institutional, socio-psychological, technological and infrastructural factors with vast implications on citizens' participation in election using e-voting system.

Finally, the fourth objective of this study aimed at identifying remedy to the factors with the potential implications for imposing decrease in voter turnout. Some of the remedies identified lie in the interplay of institutional capabilities; policy framework and regulations, availability of technology and infrastructure, skilled and experienced staff, effective information dissemination strategy, incremental implementation of the technology and technological design.

7.3 Research Question One: Effect of DoI Constructs, Trusting Variables and Computer Self-efficacy on Voter's Intention to Adopt e-Voting System

In accordance with research question one of this study and the hypothesized relationships developed thereafter, this section discusses results of relationships between seven exogenous constructs and an endogenous construct, intention to adopt. The exegenous construsts are (1) perceived trialability (2) perceived observability (3) perceived ability to use (4) trust in the technology (5) trust in the electoral government officials (6) trust in the politically elected government officials and (7) computer self-efficacy.

7.3.1 Direct Effect of Perceived Trialability on Intention to Participate

In accordance with the Diffusion of Innovation theory, citizens' perception about attributes of a system are vital criteria capable of motivating or demotivationg adoption decision (Rogers, 1983; Moore & Benbasat, 1991). In essense, citizens' perception about the attributes of e-voting system is an essential component in measuring adoption decision. The perceived attributes of e-voting system has various dimensions that offer citizens opportunity to assess and evaluate the system for adoption decision.

Perceived trialability in the context of this study refers to the extent to which a citizen (eligible voter) perceived experimenting the proposed e-voting system of election on trial basis before the actual adoption in the public elections. Perceived trialability is a risk and uncertainty assessment technique a citizen would like to utilize in order to assess a new system prior to making decision of either acceptance or rejection (Rezaei-Moghaddam & Salehi, 2010; Rogers, 1983). The construct concerns with assessing perception of the potential adopter on the need to have direct experimentation of innovative practice before

adoption while shutting down all windows for proxy. In addition, assessing perceived trialability of the citizens terminates with experimenting the innovation. Once the innovation is experienced, the relevance of perceived trialability vanished. This requirement makes perceived trialability only relevant in the pre-adoption period of the innovation. In recognizance of this point, perceived trialability is more of pre-adoption variable than post adoption. Post adoption researchers often-considered perceived trialability variable irrelevant for their studies (Van Slyke et al., 2004).

In conformity with hypothesis H1, the findings of this study established significant positive relationship between perceived trialability of e-voting system and voter's intention to adopt at ($\beta = .178$; $t = 3.93$, $p < .01$; f^2 .017 – none). The finding of this study contradict some literature that reported non-significant association between perceived trialability and adoption (Park & Chen, 2007) while concur with the stream of previous research study that indicated significant positive effect of perceived trialability on the intention to adopt related technologies (Wungwanitchakorn, 2002; Mahmod, Dahlan, Ramayah, Karia, & Asaari, 2005; Rezaei-Moghaddam & Salehi, 2010; Chen et al., 2009).

In accordance with our prediction, the findings of this study demonstrated that citizens with high perception of trialing the proposed e-voting system of election on limited basis have the higher propensity to participate in election using the system. As placing the proposed e-voting system on trial basis provide citizens with the opportunity to either certify or decertify the operational modules of the system, citizens perception of trialing e-voting system on limited basis influences decision to adopt the system.

From the adopter viewpoint, perceived trialability is a mechanism that provides solace to grieve fear of uncertainty, risk and negative consequences of adopting new practice (Rezaei-Moghaddam & Salehi, 2010; Rogers, 1983). Perceived trialability of e-voting system can be conceived as psychological and cognitive ability to systematic and incremental implementation of the technology capable of neutralizing citizen's fear of uncertainty rattling citizens-technology interaction in a real event (full-scale implementation).

Perceived trialability of e-voting finds its way to influence intention to participate in election using e-voting system because, through incremental, gradual and or limited practice of the proposed innovation in form of piloting, citizens' fear of switching to innovative practice would be neutralized if not totally eliminated. This reason connects the dots to the emotional and psychological implications of perceived trialability. In addition, trialing e-voting system on limited basis (non-national election, e.g. Local Government or State Government elections) and often not real election (e.g. stage or simulation) can expose citizens to operational modalities of the innovation thereby induce emotional and psychological comfort when it comes to the real exercise (Rezaei-Moghaddam & Salehi, 2010).

Furthermore, perceived trialability of e-voting system can be seen as an avenue in which citizens would be empowered with prior experiences and skills to handle the technology when it comes to real practice. It is therefore an avenue through which the capacity of the citizens could be enhanced. Trialability is a technique citizens admire to engage in self-assessment vis-à-vis the innovative practice. It is therefore a capacity building techniques.

Policy makers should therefore be sensitive to the need of citizens to trial the technology in non-national elections as many times as possible before adoption in the nation elections.

7.3.2 Direct Effect of Perceived Observability on Intention to Participate

On the other hand, perceived observability as one of the factors used to explain the user adoption and decision-making process is defined as the extent to which citizens perceived the results of using e-voting system could be observed and shared with others. Observability is an inquisitive perception of the citizens that project outcome of using the technology as being conspicuously visible and allows sharing with others.

Our findings demonstrated significant positive association between perceived observability of e-voting system and the citizen's intention to participate at ($\beta = .240$; $t = 3.85$, $p < .01$; f^2 .020 - small). The finding is in concord with extant literature that found significant positive correlation between perceived observability and adoption (Park & Chen, 2007; Rezaei-Moghaddam & Salehi, 2010; Salehi, Hayati, Karbalaee, & Chin, 2012; Adhiutama, 2011). In addition, our study is in perfect match with Martins, Steil and Todesco's (2004) study that singled out the perceived trialability and perceived observability variables as the most significant predictors of adoption.

Stronger contributions of perceived observability on intention to participate when compare with the contributions of perceived trialability is not surprising as various research studies indicated stronger significant positive influence of perceived observability on intention to participate as compare to perceived trialability (Salehi, Hayati, Karbalaee, & Chin, 2012; He, Duan, Fu, & Li, 2006). Significant positive relationships between perceived trialability

and intention to participate; and perceived observability and intention to participate notwithstanding relatively small effect size of the former, have several implications to potential adopter, research and practice of democracy, public policy and information system.

The findings also demonstrated that the higher citizens' perception of tangibility and demonstrability of the results of using e-voting system the higher the adoption rate suggesting that the higher citizens perceived outcome of using the technology as being good experience and conspicuously enough to share with others the more influence their adoption decision (Moore & Benbasat, 1991). It can also be infer from the findings that citizens with a higher perception of the outcome and experience of using the proposed e-voting being conspicuous and capable of sharing with others, the higher his/her intention to use the technology in the national election.

In this circumstance, the focus of research is the public national election. Demonstrating significant positive influence of perceived observability in the pre-trial stage brings to relevance, perceived trialability to enable maximize utilization of perceived observability. Succinctly put, trialability can be explored as an antecedent of perceived observability. This is in accordance with the idea hinted by (Hall, 2004) that observability is the perception of the citizen concerning the extent to which the outcome of innovation can be evaluated.

7.3.3 Direct Effect of Perceived Ability to Use on Intention to Participate

Technological and psychological competence of the citizens to use new technology is an important adoption variable. Citizens' perception of how easy or difficult is the new technology influences their likelihood to adopt. Hence, perceived ability to use as an important adoption variable, provide insight about individual adoption decision. In accordance with this study, perceived ability to use is defined as citizens' perception of self-ability and self-competence to manipulate new e-voting system for casting vote.

In accordance with our model, we have conjectured that perceived ability to use has causal effects on intention to participate (H3). Our path analysis has provided support for H3 that perceived ability to use is a predictor of intention to participate. The result demonstrates that perceived ability to use is a significant predictor of intention to participate using e-voting system at (β = .114; t = 2.19, p < .05, f^2 .001 – none). From statistical analysis, it can be observed that intention to participate is affected by causal effect of perceived ability to use. The result conformed to previous studies that found perceived ability to use as significant predictor of e-government adoption (Shareef et al., 2011).

Finding of this study revealed that perceived ability to use is a predictor of voters intention to participate (β = .114; t = 2.19, p < .05; f^2 .001 – none). The results corroborate with the extant literature that found perceived ability to use as the most contributing predictor of e-government adoption at the interaction stage use significant positive correlation between perceived ability to use and e-government adoption (Shareef et al., 2011). The results confirmed hypothesized statement (H7), which predicted positive influence of perceived ability to use on voters' intention to participate. The results depicted that increase in voter

perceived ability to use e-voting system increases his/her intention to participate in election using the technology ($\beta = .114$; $t = 2.19$, $p < .05$).

The construct perceived ability to use, which incorporates the integrated view of complexity of DoI, and Perceived Ease of Use of TAM (Shareef et al., 2011) is a predictor of e-voting adoption. The more citizens perceive self-proficiency and competent to interact with e-voting system, the more likely they develop intention to use it. In another word, when citizens perceive having technological and psychological ability to use e-voting, the most likely increase their intention to adopt. In essence, intention to participate in election using e-voting system increases with the increase in the perceived technological and psychological ability of citizens to use the e-voting.

It could also be deduced that if a potential voter believes that he/she is capable of using an e-voting system, he/she will develop intention to use that system. Therefore, the causal relation of perceived ability to use and intention to participate has a strong theoretical base. It is clear that perceived ability to use concerns with those beliefs of positive attitude toward adopting e-voting, which in turn affect intention to participate. Perceived ability to use has a positive relation with intention to participate both directly and through the mediating effect of perceived relative advantage. When potential voters believe that they have sufficient ability to interact with e-voting system, they perceived the relative benefits of participating in election using the technology. Igbaria and Iivari (1995) postulated that high complexity is linked to low perceived ease of use.

7.3.4 Direct Effect of Trust in the Technology on Intention to Participate

Trust in the Technology according to this study is defined as the extent to which a citizen perceived the proposed e-voting system as being reliable, trusted and dependable medium for casting vote, transmitting, and tallying, processing and producing results of public elections. In accordance with our findings, trust in the e-voting system has significant influence on intention to participate ($\beta = .275$; $t = 5.09$, $p < .01$), which validated our earlier hypothesized relationship (H4). Our findings about trust in the technology contradicted the findings by Carter and Belanger (2004) that showed trust in the internet does not have a direct effect on intention to use state e-government services. However, our findings is in line with previous research studies that found impact of trust as an important determinant of e-government service adoption (Belanger & Carter, 2008; Carter & Weerakkody, 2008; Colesca, 2009; Kotamraju & van der Geest, 2012), and vital predictor of intention to use (Karavasilis, Zafiropoulos, & Vrana, 2011; Gefen et al., 2003; Pavlou, 2003). Trust in e-Government services can help citizens overcome perceived risks (Alsaghier et al., 2008), and in turn influence use intentions (Fu et al., 2006). Study by Schaupp and Carter (2005) found that trust in internet has significant impact on intention to use e-voting system. In addition, the result of a study by Teo et al. (2008) indicates that trust in technology is a significant predictor of trust in e-government Web sites for active users.

Perception of trust in the technology influences citizen's intention to participate using the technology, and most importantly through perception of the relative advantage of the technology. In essence, increase in citizen's trust in the technology translates into increase in the perception of relative advantage of the technology. Depicting internet trust as an

essential factor influencing individuals' intentions to use an electronic voting. The importance of trust in the technology in the context of e-voting system of election cannot be overestimated. Innovative method of voting involving use of electronic device is prone to uncertainty and risk than traditional voting system. Under conditions of uncertainty and risk, assessment of trust of e-voting system is critically important. Many studies have identified the building of trust in the technology as a fundamental and yet unresolved issue in the adoption of e-voting system (Schaupp & Carter, 2005; Carter & Belanger, 2005; Carter & Belanger, 2012; Carter & Weerakkody, 2008).

Security risk as a powerful threat to e-voting adoption affects voters' trust in the technology. This is because, threats of system hacking, denial of service and fake voting sites can lead to change of results; submission of electronically altered results or violate the principle of privacy and anonymity of voting process (Fernandez et al., 2013; Moynihan & Lavertu, 2012; Kozakova, 2011; Schaupp & Carter, 2005). Trust in e-voting is contingent upon citizens' confidence in the reliability and privacy of the technology (Toregas, 2001). These potent obstacles raise concerns to improvise means of auditing results of electronic elections (Jones, 2004).

Lack of trust is capable of deterring e-government adoption in general (Khorshidi, 2012), and a serious barrier to e-voting system adoption in particular. It is therefore suggested that policy makers should ensure the technology bridges security lapses, and attract citizens' confidence to deter repercussion effect of preference for traditional paper ballot system of voting (Mayer, Davis, & Schoorman, 1995; Schaupp & Carter, 2005; Fernandez et al, 2013; Jaeger & Thompson, 2003). If not properly handled, issue of trust in e-voting system can breathe mistrust into the electoral process and affect participation (de Jong et al., 2008).

7.3.5 Direct Effect of Trust in Electoral Government Officials on Intention to Participate

Closely related with trust in the technology is the trust in the government officials. Little attention is accorded to empirical research on trust between citizens and organizations as stream of research literature on trust focus attention on organization-to-organization trust and people-to-computing systems trust (Mayer, Davis, & Schoorman, 1995). According to this study, trust in electoral government officials is the extent of citizens' trust and confidence in the ability of the electoral government officials to use their official capacity truthfully and honestly in handling the proposed e-voting system without being partisanship. Trust in the politically elected government is considered the extent of citizens' trust and confidence in the performance of the politically elected or appointed government officials as not using their official capacity to influence election outcome using the proposed e-voting system.

Our initial path analysis of direct effect when the mediator is controlled, the results indicated that both trust in the electoral government officials and trust in politically elected government officials were significant predictors of intention to participate, meaning that increase in citizen's trust in both electoral government officials and politically elected government increase his/her intention to participate. In the second analysis of the entire constructs of the model, trust in politically elected government officials was not significant predictor of intention to participate, plausibly; the perceived relative advantage (mediator) overtakes its weights.

Indicative in our model analysis, trust in the electoral government officials is positively related to intention to participate, meaning that increase in citizen's trust in electoral

government officials increase his/her intention to participate. The result is in conformity with the previous studies that showed direct effect of trust in government on intention to use e-voting system (Schaupp & Carter, 2005; Carter & Belanger, 2012). On the other hand, as a model, measuring the combined effect of perceived trialability, perceived observability, perceived ability to use, perceived relative advantage, trust in the technology, trust in the electoral government officials, trust in politically elected government officials and computer self-efficacy, trust in politically elected government officials has a positive but non-significant effect on intention to participate. It is indicated that voter intention to participate in elections is influenced significantly by trust in the electoral government officials.

On the other hand, the qualitative interviews support the statistical results of the quantative test. Citizens' trust and confidence in the electoral body is a requisite to institutionalization drive and that frequent dissolution and reestablishment of EMB in Nigeria defied the body (INEC), the require tenancy to gain trust and confidence of the citizens (Maiye & McGrath, 2008).

Trustworthiness of the election authorities is a sine qua non for participation in election. Citizens' decrease in participation is partly contingent upon loss in confidence in the electoral officials. Embedded in the selective choice approach to participation, when citizen losses confidence in the ability of the electoral officials to neutrally organize and supervise election, the suspicion is that the outcome of such election is considered a foregone conclusion. In this situation, citizen develops a feeling that his/her vote is irrelevant and consequently abstains from participation. Majority of interviewees expressed high distrust and lack of confidence in the electoral officials. Perception of trustworthiness of the

electronic voting system has a reciprocal implication with the perception of trustworthiness of the institution responsible for organizing the election (Avgerou et al., 2007; Adeyinka & Olasina, 2012).

Invariably, the negative attitude exhibit by the electoral officials creates general sense of distrust and eventually affects confidence of citizens to participate in election using e-voting system (Goldsmith, 2012). On the involvement of electoral officials in electoral related crimes, INEC boss stressed, "in fact we know that there are cases when some of our staff engaged in fraudulent activities . . . . This is the reality, despite our actions to change the situation" (Jega & Hillier, 2012, p 9). Such negative attitude exhibit by the electoral officials creates sense of distrust that subsequently affects citizens' trust in the election and the entire electoral process, considering the role of electoral officials in the voting policy design and implementation (Goldsmith, 2012; Moynihan & Lavertu, 2012). Therefore, citizens' cognitive decision to participate in voting using e-voting system to some extend, is contingent on the trust citizens repose on the electoral officials. Avgerou et al. (2007) put forward an exposition that success of e-voting system in a society whose citizens do not have trust and confidence in its electoral institution is rather mirage.

7.3.6 Effect of Trust in Politically Elected Government Officials on Intention to Participate

Our statistically analysis indicated that trust in politically elected government officials is not significant predictor of intention to participate. Literarily, increase in voter trust in the politically elected government officials does not increases his/her intention to participate.

The result is not in support to our initial hypothesized relationship (H_6), which conjectured that trust in politically elected government officials has significant influences on intention to participate. The finding is not surprising as it conformed to the previous studies that found non-significant effect of trust in the government on intention to adopt (Carter, 2008, Carter & Belanger, 2004; Powell et al., 2012).

Considering significance influence of trust in politically elected government officials on intention to participate when the perceived relative advantage mediator was controlled and subsequent non-significance relationship in the later analysis of the model can be statistically explained that the perceived relative advantage mediator overtakes the weight of trust in politically elected government officials. In essence, trust in politically elected government officials is a predictor of intention to participate in isolation of mediating effect of perceived relative advantage, while the former is not a significant predictor of intention to participate in the presence of later. In the presence of both attitudinal variables (Trust, Perceived Risk) and operational variables (Compatibility, Relative Advantage, etc.) trust has no significant effect on intention to use e-government websites (Zafiropoulos, Karavasilis, & Vrana, 2012).

However, significance positive relationship between trust in the electoral government officials and intention to participate at one hand and contrasting positive but non-significance relationship between trust in politically elected government officials and intention to participate on the other hand can be plausibly explained from the perspective of citizens' perception to the distinct roles played by electoral government officials and politically elected government officials (Powell et al., 2012). Logically, more than 70% of our sample comprise of illiterate and semi-illiterate. This demographic property help in

shaping a belief that electoral officials are sole responsible for organizing and conducting election while making it difficult for the respondents to see the connection between politically elected government officials with election interference. The possibility of citizens to have trust in electoral government officials and not politically elected officials or vice visa cannot be ruled out (Powell et al., 2012).

The proposition further entails that politicians can influence election at the volition of the electoral government officials. Although both can influence election process, the degree of their influence varies as electoral government officials influence elections as de jure while politicians affect the elections as de facto. Citizens' trust in the electoral government officials as determinant of adoption decision significantly influences their intention to adopt. On the other hand, trust in politically elected officials has no significant effect on intention to adopt. It is indicated that voter intention to participate in elections is influenced significantly by trust in the electoral government officials compare with the politicians.

Our qualitative account of the respondents on the othe hand, slightly differ from the statistical finding since lack of trust in the elected or appointed government officials is identified among factors imposing high cost of voting on citizens' voting participation. The officials are often accused of using strategic positions of authority and of controlling public resources to interfere in election matters in various capacities. Some of the fears entertain by our respondents concerning the role of politicians in relation to e-voting adoption includes connivance with electoral officials to rig elections, employing the services of scammers, and or illegitimate use of force.

Public trust on government officials is a major concern to technology adoption in public sector. The questionable sincerity of political leaders who are determined to personalize

public institutions to achieve mundane interest is a point of serious concern to technology adoption of the public sector (Alemika, 2011; LeVan & Ukata, 2012; Maiye & McGrath, 2008; Salam, 2012). Previous performance of political office holders in Nigeria who dastardly employ all available machinery to circumvent electoral process to perpetrate rigging to achieving selfish interest make citizens skeptical over their sincerity in the implementation of sophisticated electoral system such as e-voting (Adesua, 2010).

In conformity with the above assertion, INEC and FES Nigeria (2011) reported that despite regional variance in rating trust in elected officials in Nigerian context, there is generally low level of citizens' trust in elected officials giving their previous roles as accomplice of electoral corruption. "Nigeria's experience with government bureaucracy, proves that a gap exists between government and citizen, whereby creating a situation where, transparency and trust is lacking" (Momoh & Majaro-Majesty, 2008, p 398).

Institutional weaknesses have been a clog for efficient and effective performance of democratic institutions in most developing countries thereby encourages citizens' participation in election. Trust in the institution, policy framework and technical capacities are first tier challenges confronting voter turnout in Nigeria.

7.3.7 Direct Effect of Computer Self-efficacy on Intention to Participate

Self-efficacy is a factor that plays an important role in shaping individuals' beliefs and behaviors. In the context of this stud, computer self-efficacy is defined as the extent to which a citizen is confident in his/her ability to operate computer related technology empowers him/her to interact with e-voting system. Self-efficacy beliefs influences cognitive, motivational, and affective and selection processes in that it shape not only behavior but also determines how one feels, thinks and motivates himself (Bandura, 1994).

People with strong self-efficacy approach difficult task as challenges to be mastered rather than threats to be avoided thereby enhance their life accomplishment.

In contrast, people of weak self-efficacy consider difficult task as personal threat, dwell much on personal deficiencies anticipated obstacles and adverse outcomes hence, they try to avoid them (Bandura, 1994). General efficacy measure is a predictor of intentions to use to a wide range of technologically advanced products (Mathieson, 1991). However, behavioral intention to use e-voting system has much to be explored from perceived psychological competency of oneself in relation to the technology and the course of action (Bandura & Adams, 1977). We conjured that potential voters with high computer self-efficacy (used computers more and derived more from their use of computers) are likely to adopt e-voting system (a computer related technology). Going by the path analysis, the results did not support the direct effect of computer self-efficacy on intention to participate. Non-significant results of direct effect of computer self-efficacy on intention to participate corroborate with the research studies (Carter, 2008). However, other stream of literature found significant effect of computer self-efficacy on intention to adopt (Chen et al., 2009; Oye, A.Iahad, & Ab.Rahim, 2012; Torkzadeh, Pflughoeft, & Hall, 1999). The non-significant effect of computer self-efficacy on intention to participate may be due to strong influence of the other adoption variables – trust in the technology, perceived trialability and perceived observability (Carter, 2008).

In another dimension, computer proficiency distribution from the demographic information of the respondents indicated that up to 36.8% were not having computer skills. Larger portion of the remaining 34% and 29.2% of the respondents who indicated having basic skills of computer and advanced computer skills respectively have confused GSM phone

operation with computer skills. Based on the computer proficiency status of the study population putting the overall figure to 63.2%, the possibility of the respondents to judge similarity between GSM operation and e-voting system the same way they misconstrue GSM operation to computer self-efficacy cannot be ruled out. The respondents can be seen as technologically proficient enough to consider low computer self-efficacy as a barrier to e-voting adoption hence; computer self-efficacy is not a factor influencing adoption decision. It is not surprising that Chen et al. (2011) postulated that findings related to self-efficacy continue to vary based on the various exogenous factors such as different aspects of technology under study or contextual dimension of the technology and demographic status of the potential adopter.

7.4 Research Question Two: Mediating Effect of Relative Advantage in the Relationship between DoI Constructs, Trust in the Technology, and Computer Self-efficacy on Voter's Intention to Participate

Research question two and the hypothesized relationships developed thereafter is set to examine mediating role of perceived relative advantage in the relationships between perceived trialability, perceived observability, perceived ability to use, trust in the technology, computer self-efficacy and intention to participate in election using e-voting system.

7.4.1 Mediating Effect of Perceived Relative Advantage, A Determinant of Voting Participation

The results of our preliminary analysis revealed that perceived relative advantage has the most significant positive relationship with the intention to adopt e-voting system. The

results contradict the finding of Carter and Belanger (2005) nonetheless conformed to the stream of previous studies that found perceived relative advantage as the most important factor in determining adoption of innovations (Benbasat & Barki, 2007; Carter & Belanger, 2012; Tornatzky & Klein, 1982; Yang, Lay, & Tsai, 2006; Premkumar & Roberts, 1999; Premkumar, Ramamurthy, & Nilakanta, 1994). In general, the significant positive association of perceived relative advantage of an innovation and rate of adoption has been enshrined in the Diffusion of Innovation theory (Rogers, 1983).

Inconsistent results of adoption variables involving trialability, observability, trust in the technology and computer self-efficacy in the previous studies, (for example, Cao & Mokhtarian, 2005; Park & Chen, 2007; Tobbin & Kuwornu, 2011; Adhiutama, 2011; Sang et al., 2009) suggest that citizens' perception of e-voting system in the light of the variables may lead to adoption or not to adopt. In another words, even citizens who have positive perception of trialability, observability, perceived ability to use, trust in the technology and computer self-efficacy of an e-voting system may choose not to adopt it if they do not perceived its relative advantage. Interestingly, the findings of this study suggest that mediating effect of "Perceived Relative Advantage" explains much of inconsistent results of the variables. The unveiling proposition has been implicit in the extant literature (Rezaei-Moghaddam, Salehi, & Ajili, 2012; Davis, 1989; Wu & Wu, 2005).

In according with the objective two of this study and in tandem with the major assumption of rational choice theories, a rational voter decision to participate in election is contingent on calculating the costs and benefis of voting. Given our postulation whether a voter cognitive decision to participate is influenced by various aspects of relative advantage of e-voting system in accordance with DoI theory, the results demonstrates that a voter

cognitive decision to participate is strongly influenced by the relative benefits of e-voting. The findings revealed that relative advantage of e-voting is a key determinant of voter cognitive decision to participate in voting. In essence, increase in voter perception of relative advantage of e-voting system increase the propensity of a voter to participate using the system. Moreover, the results depict relative advantage of e-voting as a key factor with strong mediating properties capable of transferring the effects of perceived trialability, perceived observability, trust in the technology, computer self-efficacy towards influenceing voter decision to particitae in voting.

At the instant of our study, various domains of relative advantage of e-voting nested technological attributes as determinants of voter cognitive decision to participate using e-voting system. Domains of relative benefits of e-voting system could be in economic terms, social-prestige, convenience, and satisfaction (Rogers, 1983). In addition, social benefits, time saving and hazard avoidance are measured (Moore & Benbasat, 1991) which influence voter cognitive decision to participate using e-voting system.

Summarily, a voter cognitive decision to participate in voting is influenced by contrasting relative benefits of the new (proposed) voting system with the existing methods thus, economic benefits, image enhancement, convenience and satisfaction. Therefore, perceived relative advantage can be understood from socioeconomic, socio-psychological and technical viewpoints. From technical perspective, if a voter adjudge voting system to have high costs of election either by imposing procedural hurdles in the voting process and or perceived as porous that can be manipulated to temper with the outcome of the elections the less likely to participate in the voting. On the other hand, voting system is likely to encourage voting participation when a voter perceived it to marginally reduce the costs of

voting, make available relevant information for citizens to decide how to vote and or when the citizens feel that the security, secrecy and integrity of the system would enhance democratic politics (credible and transparent elections) (Norris, 2002).

Relevance of mediating effect of perceived relative advantage (mediator) in the relationship between exogenous variables (perceived trialability, perceived observability, perceived ability to use, trust in the technology, computer self-efficacy) and endogenous variable (Intention to Participate) can be plausibly explained in the sense that the exogenous variables embedded some properties reflecting relative benefits of e-voting system. It can therefore be understood that perceived relative advantage mediates the relationship between perceived trialability, perceived observability, perceived ability to use, trust in the technology, computer self-efficacy and intention to participate because those variable possess some differentiated elements from various domains of perceived relative advantage that seek to assess relative advantage of the technology before forming intention to participate.

The model demonstrated the indirect effect of perceived trialability, perceived observability, perceived ability to use, trust in the technology and computer self-efficacy on intention to participate channeled through perceived relative advantage (mediator). It is essentially clear that perceived relative advantage has mediating properties that explain 'why' perceived trialability, perceived observability, perceived ability to use, trust in the technology and computer self-efficacy influence intention to participate in voting. The indirect effect of perceived trialability, perceived observability, perceived ability to use, trust in the technology and computer self-efficacy may partly be explained by the fact that the perceived relative advantage explains why voters perception of the variables influences

their participation decision. As the mediating role of the perceived relative advantage variables provides a partial answer to the "why" question, the implications of the findings showed that as voter perception of trialability, observability, ability to use and trust in the technology of technology; and computer self-efficacy increases, the chance of voting participation decision also increases. The perceived relative advantage mediator help explain why this relationship exists.

By other way round implications, voter perception about trialability, observability, ability to use, trust in the technology and computer self-efficacy embodied influential elements aiding predetermination of perceived relative advantage of e-voting system and in turn influence intention to participate. For instance, a voter perception of trialability of e-voting system is to assess its pros and cons in relation to previous practice as a requisite to participation decision.

Parallel with perceived observability construct, perceived trialability of an innovation is an attempt to measure the benefits of an innovation (Cao & Mokhtarian, 2005). ". . . observability suggests that one will be more likely to adopt an innovation if its benefits are visible and tangible" (Carter & Weerakkody, 2008, p 475). Trust perception of the medium of transaction is critical and complementary to characteristics of innovation such as usefulness and ease of use in the process of forming decision to use (McKnight, Choudhury & Kacmar, 2002). Behavioral intention to participate in voting using e-voting system has much to be explored from perceived psychological competency (image) of oneself in relation to the technology and the course of action. Linking self-efficacy with perceived relative advantage, voter perceived self-efficacy determines the ability of the people to choose alternative course of action, require relative or absolute assessment of the amount

of effort expend, endurance in the face of obstacles and adverse experience (Bandura & Adams, 1977).

The foregoing propositions therefore are clear testimony that perception of relative advantage of e-voting system can be established through the combined elements of perceived trialability, perceived observerbility, perceived ability to use, trust in the technology and computer self-efficacy, and all together affect voting participation decision using e-voting. More importantly, a new insight towards results consistency is provided. In addition, the proposition brings to relevance, right sequential order of the relationship between and among the perceived technological characteristics of e-voting system, including other operational research variables.

Significance results of mediating effect of perceived relative advantage suggest that although, voter perception regarding the attributes of the technology, trust in the technology and computer self-efficacy influence participation decision, such influence is determined through perceiving comparative benefits of the system. perceived relative advantage is a construct that explains the nature of the relationship between perceived trialability, perceived observability, perceived ability to use, trust in the technology and computer self-efficacy constructs and intention to participate in voting using e-voting system.

According to our model, placing perceived relative advantage of e-voting in the center of voting participation equation provides better understanding of why perception of the attributes of the technology and other operational variables influence voter turnout. A voter implicitly engage in comparative analysis of the proposed e-voting in the light of economic

benefits, image enhancement, convenience and satisfaction including the costs of using it. The assessment is in the light of overall benefits derive in ratio of time and efforts require to use (Hall, 2004). Voter cognitive decision to participate in voting using e-voting system will be influenced in as much a voter perceives overwhelming advantage of the proposed e-voting system in the light of trialability, observability, ability to use; trust in the technology and computer self-efficacy of e-voting system over the existing manual paper-based method.

At the instant of this study for example, computer self-efficacy did not have a direct effect on intention to adopt e-voting. If the mediating role of perceived relative advantage is not included, the natural conclusion is that computer self-efficacy does not influence voting decision. However, our second model results have shown that computer self-efficacy has indirectly effect on intention to participate in election using e-voting system through perceived relative advantage. In essence, computer self-efficacy has significant positive influence on perceived relative advantage ($\beta = .068$; $t = 1.633$, $p < .05$), which in turn increases the likelihood of election participation.

In the presence of perceived ability to use, citizens enjoy the advantage of e-voting system and consequently influence their decision to participate using the system. Therefore, our hypothesis that perceived relative advantage mediates the relationship between perceived ability to use and intention to participate is fully supported. The result is consistent with the previous studies that perceived ease of use, a surrogate of perceived ability to use has direct effect on perceived usefulness, a surrogate of perceived relative advantage, which in turn influence adoption decision (Fu et al., 2006; Davis, 1989; Schepers & Wetzels, 2007). In conclusion therefore, our model demonstrated that in addition of being direct predictors

of intention to adopt; perceived trialability, perceived observability, perceived ability to use, trust in the technology and computer self-efficacy are essential determinants of intention to participate in voting using e-voting system through perceived relative advantage. Moreover, trust in the electoral government officials is a critical factor of voting participation decision.

7.5 Research Question Three: Factors Affecting Participation in Election using e-Voting System

A rational voter calculates costs and benefits of voting being determinants of participation in election. In the preceding sections, we discussed how technological attributes of e-voting system, socio-psychological factor of a voter and trust in the technology, and in the government officals influence citizens' decion to participate in voting. Beyond technological attributes view of innovation diffusion theory as incentives, qualitative data on this segment extended costs and benefits of election to a broader perspective. In determining decision to participate in election, a rational voter calculates the costs and benefits of not only the voting system (equiptment) whether manual or electronic as determining factors for participation but also several factors including institutional, socio-psychological, technological and infrastructural costs.

In the course of analyzing our interview data, we arrived at the conclusion that institutional, socio-psychological, technological and infrastructural factors affect citizens' rational decision to participate in voting. The more these factors impose high cost on voting, the less likely citizens are discouraged from participation. On the othe hand, the more citizens developed trust and confidence in these factors, the more likely to participate in election.

7.5.1 Institutional Factors

In accordance with rational choice theory of participation, selective incentive implies voters' cognitive calculation of costs and benefits of voting from various aspects. This brings to relevance of citizens asseing dependability and reliability of electoral institutions responsible for the management of elections. It is evident that Nigerian electoral institution has been confronted by myriad of challenges with the implications of imposing high costs of voting on citizens. Some of these institutional-based factors posing threats to participation in voting include inadequate policy framework, independence and financial autonomy of the democratic agencies, poor resources base and questionable integrity of the government officials.

a. Credible Electoral Management Body (EMB)

Ability of the democratic institutions in the developing countries to canvass for the needed citizens' trust and confidence is affected by limited tenancy of the institutions that is often subjected to incessant dissolution (Maiye & McGrath, 2008). In addition, intricacies in the constitutional devolution of powers and responsibilities is another seeming factor undermining independency and autonomy of INEC to credibly conduct free and fair elections using e-voting system notwithstanding. The constitution empowers partisan executive arm of the government (presidency) to appoint top management staff of INEC and approve its finances. Cognitive decision of the citizen to participate in election lies in

the perception of the credibility, integrity, autonomy and independence of the electoral management body.

At the instant of this study, rational citizen is likely to participate in voting if he/she believes in the integrity of the electoral management body as capable of conducting credible, transparent, free and fair elections whose outcome reflect the actual votes cast without fear or favour. However, citizen's perception of EMB as an appendage of the partisan government officials affects cognitive decision of individuals to participate in voting.

Lack of independent and financial autonomy of the INEC is a serious obstruction to the Commission in its beat to earn citizens trust and confidence. Although Section 153 (1) (f) of the constitution provided that the Commission should be independent body. However, weakness in other constitutional and electoral act provisions reduced the Commission to the control of the executive – presidency. For example, Section 153 Subsection 6 Cap 3 comperes the power to the president to remove a Resident Electoral Commissioner with the support of two third majority of the Senate. Furthermore, Section 153 Subsection 5 Cap 1 requires INEC to submit to the Ministry of Finance, an estimate of its expenditure and income including payment during next succeeding financial year.

The pending issues of independent of tenure of office and financial autonomy of the Commission are the cause of citizens' perception that the Commission is mere appendage of the partisan executive arm of government. In accordance with the views expressed by our respondents, the scenario around e-voting policy formulation says a lot about costs of voting participation. The policy being proposed by the bureaucratic government officials

did not seek for the involvement of citizens and other wide range of stakeholders at one hand. On the other hand, an initial open support by the presidency, triggered insinuation among citizens that the e-voting policy is meant to achieve sophisticated rigging without being noticed.

From the views expressed by the respondents, inadequate skilled personnel who can effectively handle the technology is a potential challenge of e-voting implementation with serious implications on citizens' acceptance of the technology. Inadequate staff in Nigerian democratic institution has formal endorsement in that in every round of election, INEC engaged the services of Nigerian Youth Service Corps (NYSC), staff and students of tertiary institutions and staff of other government agencies as ad hoc staff. In 2011 elections alone, 368,812 ad hoc staff were engaged in various ad hoc capacities (INEC Report on 2011 General Election). Such ad hoc staffs are often engaged at a close range to the election period that makes it impossible to offer them substantial training and consequently affect their ability to manage the assigned election duties. Deploying e-voting system of election has impending problem of skilled personnel to handle technology.

b. Bureaucratic Policy Orientation (Traditional Top-Down)

Policy process is one of the major area of concern to acceptance of public decision. Issues bothering on participation in policy making is an areas of great concern, posing threat to acceptability and sustainability of government policy and programs, e-voting adoption inclusive. Non-participation of citizens and other important stakeholders such as political

parties into the process of e-voting policy induce feeling of isolation as well as exposed the proposed policy to various ladder of interpretations.

Legal framework in form of constitutional provision, laws and regulations present new challenge of for government ICT initiative. As an integral part of democratic decision-making, election is process of engaging citizens in the act of public decision for choosing their representatives – leaders. Election as a democratic decision is a wholesome process that cannot be treated in isolation from other chains of democratic decision-making. The entirety of democracy hinges on the principle of participation that allow all the stakeholders participation at every aspects of public life including political, social and economic (Majekodunmi, 2013).

Views and opinions expressed by a segment of our respondents pointed out that, in Nigeria, citizens are virtually given rights to cast their vote in an election without corresponding structure to accommodate active participation of citizens and other stakeholders in other important decision-making including decision for selecting voting system. In contrast, democracy thrives in the society where citizens are offered access to information and knowledge, and better means of disseminating the information and knowledge amongst themselves, and between themselves and those in governance positions (Majekodunmi, 2013). The attendant consequences of depriving citizens the quality participation to democratic decision can cause feeling of frustration and isolation that are key to implicating citizens' disengagement from participating in public affairs.

Such spirit of citizens engagement in democratic decision can be handicapped by providing platform for citizens to cast vote without corresponding right to participate in other decision

making process. In this situation, the citizens would develop feeling of deprivation and isolation with low morale to participate. The above scenario brings into play, the power of individual cognitive rationality and institutional trust as fundamental determinants of citizens decision to participate in voting using electronic system.

7.5.2 Technological Factors

In addition to the technological attributes advocated by the proponents of diffusion of innovation theory, our qualitative data provides a wider perspective of technoligal determinant of voter rational choice for voting participation. This is especially considering the fact that technological proficiency, competence and culture of ICT adoption is not very common in Nigeria.

Major among the factors that explain the prevailing deficit in technological proficiency in the country as the account of the respondents stressed include, poor education system amidst high costs of education, ravaging poverty among larger portion of the populace; and unavailability and non-accessibility of the technological facilities. The more educated a voter the likely have access to political information and consequent participation. On a related development, Global Information Technology Report 2014 provides a striking evidence showing deficit in poor technological readiness of Nigeria. The report ranked Nigeria 102nd with a value of 4.5 out of the 148 countries surveyed on accessibility to digital content (Bilbao-Osorio, Dutta, & Lanvin, 2014). On average, technological proficiency of citizens in Nigeria is low as large percentage of the citizens lack basic IT skills. Voter technological efficacy has profound implications on his/her decision to participate in election using e-voting system.

Most communities in Nigeria is socially bounded that warrant common feelings and concerns. In such socially bounded societies, decision to introduce e-voting amidst apparent citizens perception of lack of IT skills among larger proportion of the citizens induce psychological dissuasion of communal deprivation. ICT triumph in a society with a gauge between 75 - 85% of the citizens who are internet and computer literate (Adeyinka & Olasina, 2012).

7.5.3 Infrastructural Factors

Socioeconomic development plays an important role in citizens' adoption of government ICT initiatives such as e-voting. This is considering e-voting system of election cannot be implemented in isolation of ICT infrastructure and facilities. Poor complementary ICT infrastructure as an inherent characteristic of Nigeria countries pose serious challenge to transition to e-voting system. In recognition of imperativeness of ICT infrastructure to e-government initiative such as e-voting, various aspects of ICT infrastructure constitute measuring criteria for e-government readiness.

It is rather inconceivable for e-voting system to be implemented amidst dearth of technological infrastructure and facilities. To this effect, cross section of our interviewees expressed concern over poor state of technological infrastructure to support e-voting adoption in Nigeria. A common practice of deploying hyper-technology without requisite structures and facilities has been a problem of most government ICT initiatives in developing countries (Maiye & McGrath, 2008). e-Voting system requires internet services for the transmission and retrieval of election data across various polling booths, collation

centers, and central database, whereas electricity supply is required for the operations of the machines, computers and other electronic gadgets. Therefore, availability or otherwise of internet facility, computer and electricity supply have cognitive and psychological effect on how citizens perceived e-voting policy.

Citizens suspicious on the ability of the government to undertake e-voting project has rooted in the failure of the later to provides adequate basic facilities such as electricity, internet connectivity. Technological facilities are therefore precondition for e-voting adoption (Ahmad et al., 2015a; Adeyinka & Olasina, 2012). Albeit the main thrust of e-voting is to facilitate efficiency, effectiveness, transparency and increase participation of stakeholders thereby enhance government-citizens trust (Browder, 2005). However, attempt to introduce such a sophisticated system of election amidst dearth of technological infrastructure and facilities signal non-readiness on the part of the government, which can be a source of citizens' disillusion and loss of confidence in government ICT initiatives.

As suggested by the section of the respondents, the problem of technological infrastructure and facilities can be overcome by connecting rural areas with internet facilities, electricity, and making them accessible and affordable. This, comform with the finding of Adeleke (2015) that adequate technological infrastructure and ICT facilities and personnel should be provided for effective adoption of e-voting systemamong rural communities. It is worthy to note that such a tasking project of connecting communities with internet services and electricity in Nigeria requires strong political will and commitment, mobilization of resources and technologies, which also brings to question, timing of the proposed e-voting system.

Given that the proposed e-voting implementation failed to secure legislative ratification for 2015 implementation, and considering disenchantment of the citizens, it is an opportunity for INEC to mobilize required resources, facilities and technology to ensure basic requisite structures to support e-voting implementation in the next coming election in 2019 are met. An important task of managers and policy makers in developing countries is to make available, the required structures in addition to mobilizing resources for acquisition of technology (Avgerou, 1998). Provision of adequate technological infrastructure and facilities rekindle citizens' trust in government and its ICT initiative of e-voting system of election. Therefore, decision to adopt certain systems should be reviewed to take account of the available infrastructure (Maiye & McGrath, 2008).

Avgerou (2008) highlighted that inadequate resources, dearth of facilities, lack of political commitment, poor maintenance culture, technological and functional degradation are among the major problems of sustainability failure of IS in the developing countries. Development of ICT infrastructure and facilities is a foundation for e-democracy to thrive (Majekodunmi, 2013). However, governments of most developing countries are fun of deploying hyper-technology without requisite structures and facilities (Maiye & McGrath, 2008).

Inadequate diagnosis of requisite infrastructure often lead to failure of most government IT mediated development initiatives such as e-voting (Maiye & McGrath, 2008). Successful adoption of e-voting in Nigeria to some extend is contingent on addressing the issue of requisite infrastructure such as electricity (Ahmad et al., 2015a; Amagoh, 2015). It was found that citizens in some of part of the developing countries prepare manual means

of communication over e-government initiatives due to fear of e-barriers to participation and unavailability of requisite technological infrastructure (Oreku & Mtenzi, 2012).

7.5.4 Socio-psychological Factors

By intuitive, rational citizen calculate the intrinsic capability in form of personal beliefs, values, capacities, etc. A rational citizens is likely to participate in voting if he/she believes in democratic process as the liable system of producing viable leadership and good governance; belief in leadership that triumph through democracy as capable of solving socioeconomic problems, or democracy as being capable of ensuring mechanism of transparency and accountability. Failure to critically assess socio-economic development and problematization of developing countries as a requisite for transfer of technological initiatives from the developed world often implicated frustration in the drive for the realization of ICT-mediated development (Avgerou, 2008). Transformation to modernity through ICT mediated initiative cannot be treated in isolation from the sociopolitical and economic realities of the societies (Maiye & McGrath, 2008). Hence, socioeconomic, cultural and political antecedents of the developing societies are potential parameter that can be explored for successful integration of e-voting adoption. Understanding circumstances of IS innovation can be better off is contextual differences including socio-economic, cultural and political circumstances are considered as embodied part of the analytical discourse.

a. Illiteracy

Nigeria is rated with a very low level of political awareness. Socioeconomic factors such as high level of illiteracy among electorates, lack of access to independent professional media, poor electricity supply, wide spread abject poverty and experience of irregularities in electoral process account for the low-level political awareness in Nigeria (Onyekwelu, 2010). Account of our respondents indicated high rate of illiteracy in Nigeria, which is considered as imposing high costs of voting participation. The views expressed by our respondents concur with the existing literature, which postulated that illiteracy negatively affect individual attitude to participate in election using e-voting system in that the lower the education a person attains the less likely to adopt e-voting (Porter & Donthu, 2006). Maiye and McGrath (2008) concluded that "The decision to adopt certain systems should be reviewed to take account of... literacy levels, culture and religion" (Maiye & McGrath, 2008, p 90).

In addition to the issue of general literacy, low computer literacy as a distinguishing characteristic of many developing countries (Galimoto, Hamre, Kaasbøll, & Sandvand, 2008) is a potential challenge to e-voting adoption in Nigeria. As psychological belief in one self-ability to interact with computer, computer self-efficacy will enable citizens interact with computer related technology that can be a motivation to using e-voting system. Lack of computer skills is capable of decreasing participate in election (Chen et al., 2011).

b. Digital Divides

Beside low-level computer literacy, digitally literate population in an important actor in adopting ICT mediated initiative in election (Majekodunmi, 2013). Digital divides is perceived as another potential challenge to e-voting adoption in Nigeria going by the cross sectional views of our respondents. e-Voting adoption is likely to inconvenience a large number of voter population residing in rural areas who are less technology savvy when compare with elites/citizens in urban centers. As an emerging concept, a voter added, "e-voting adoption is capable of entrenching the existing digital divides of the rural-urban dichotomy" (Voter 14). The likely chance of citizens living in urban cities to have better exposure to voting innovation and in turn increase chances of their voting as compare to rural dwellers is high (Adeleke, 2015; Tolbert & McNeal, 2003). Therefore, e-voting may exacerbates the existing digital divides between rural and urban people.

The United Nations Conference on Trade and Development UNCTAD (2006) notes that a person in a high-income country is over 22 times more likely to be an Internet user than someone in a low-income country. Similarly, secure internet servers, a rough indicator of electronic commerce, are over 100 times more common in high-income than in low-income countries. In high-income countries, mobile phones are 29 times more prevalent, and mainline penetration is 21 times that of low-income countries. Relative to income, the costs of Internet access in a low-income country is 150 times the costs of a comparable service in a high-income country.

c. Beliefs System

A small segment of our respondents highlighted on negative belief of the community as impediment to e-voting adoption. The views associated with imposition of democratic norms and values . . . Understanding historically constructed social conditions is very critical aspect of the evolution and development of IS innovation process (Avgerou, 2008). Trustworthiness of e-voting is a function of positive attitude of the society towards the use of ICT, and that citizen with negative predisposition of ICT might not have perceived trustworthiness of government-mediated initiatives (Avgerou et al., 2007). Two potential areas of ICT-mediated development research in developing countries are understanding how historically constructed social conditions (with cultural, economic, political and cognitive dimensions) are implicated in the IS innovation process as well as understanding how IS innovation is implicated in interventions for changing people's life conditions through different development ideologies and policies (Avgerou, 2008).

Rogers, Singhal and Quinlan (2005) urge that locally generated innovations are more likely to be culturally appropriate, and induce sense of ownership by a potential adopter than externally persuaded innovation, which is prone to inertia and resistance. Such conditions of ICT competence and culture are not common in many developing countries, most of which rely on transferring ICT from abroad and often face suspicion about its appropriateness Avgerou et al. (2007).

7.6 Research Question Four: Remedy for Potential Challenges of Voter Turnout in a Drive to Adopt e-Voting System

Majority of our respondents interviewed expressed their opinions on how best to overcome the potential challenges of e-voting adoption in Nigeria. Some of the measures include strengthening institutional capacity, effective information dissemination, trialing the technology and adequate provision of requisites facilities.

Success of government ICT initiative lies in the interplay of institutional capabilities, policies, regulations and technology, hence an institution with capacity to steer reform is a critical condition for any government ICT initiatives (Navara, 2011). Institutional capacity is a sine qua non to free, fair and credible election, lack of which cause serious challenge to e-voting adoption by the citizens. Institution in the context of this study refers to various structural arrangement internal and external to the democratic institution, legal framework, resources mobilization; knowledge, capacity and integrity of the officials.

Institutional capacity has a close link with availability of experienced staff. In the context of citizens' participation in election using e-voting system in Nigeria, availability of skilled and experienced staff are important condition. Inadequate personnel with basic IT skills is a major challenge of INEC (NEC, 2011). Furthermore, the popular anticipation that e-voting system of election increase citizens' trust in the election can only be realized if the citizens have trust in the democratic institutions including the officials responsible for the conduct of the election, in this case, INEC (Adeyinka & Olasina, 2012). In essence, integrity and sincerity of the election organizers must not be questionable. This is because, ". . . once people with integrity and sincerity are given the responsibility to handle the proposed voting system, I believe citizens would like to accept (Voter 10).

Addressing institutional weaknesses entails enhancing institutional capacity by providing effective participatory policy process, developing personnel with the requisite knowledge and skills and by developing enabling organizational structures and systems including policy framework.

Citizens' cognitive judgment of how easy or difficult is the e-voting depend on amount of the information at their disposal to evaluate the technology. Unavailability of information concerning the proposed e-voting constrain citizens' ability to give it value assessment. In the opinion of Alliance for Credible Election (ACE), INEC has to consider many factors before introducing e-voting system of election. The secretary of the ACE, Emma Ezeazu, cautioned against rushing, saying that it should be 'piloted' and 'localized'. He further emphasized, "Electronic voting is the direction to go. But INEC has to begin by piloting it. It is complicated it must be localized. You don't import abandoned and outdated technology from Brazil and China and flood the polling booths with them. We must know the working processes of the machine" (Oladesu, 2012).

Citizens required to trial the technology before adopting as observed by Hassan (2011) who quotes Jega saying, "We can start piloting electronic voting machines on pilot basis to know if we will be able to use that in 2015". In the same vein, Salam (2012) suggested that piloting the proposed e-voting in Nigeria would be a good testing ground for 2015 election. The expected feedbacks by the citizens on pilot testing especially on capacity building, infrastructure upgrade, technological design and voter participation would help to reduce massive hiccups when it comes to a full scale, countrywide adoption of the voting system.

Provision of requisite facilities is an essential indicator for government readiness to implement e-voting system. Facilities such as electricity supply, internet facility and accessibility can provides green light to the citizens on the commitment and determination of the government to adopt e-voting system. Research studies suggested that measures to increase citizens' participation in government initiatives include improving the quality of life, reducing the costs of communication and information facilities and bridging the digital divides (Jaeger & Thompson, 2003; Akman, et al., 2005).

7.7 Theoretical Validation

In a political sphere, several factors motivate voters to participate in election, individual incentives being a fundamental approach of rational choice model inclusive. In view of the wave of increasing use of technology in democratic process across the globe, a number of research has been conducted on citizens' adoption of e-voting system (Carter & Belanger, 2012; Powell et al., 2012; Salimonu, 2013; Schaupp & Carter, 2005; Yao & Murphy, 2007). However, research has rarely been conducted on the impact of e-voting system in determining the rational choice of voter to participate, especially in developing democracy. This brings into nexus, rational choice theory, diffusion of innovation theory, trust model and computer sel-efficacy constructs.

Our model takes into cognisanze instrumentality of e-voting system to increase voter turnout as a function of the extent to which the technology influences rational decision of the voter. We therefore recognized the valid contributions of innovation diffusion theory

in assessing citizens intention to adopt e-voting system as well as the contributions of rational choice approach to voting participation using the system. The strength of standard rational choice theories lies in the assumption that citizens participate in voting purely on rational ground and that votes are cast based on actual costs and benefits. On this note, Norris (2002) argued that even with the assumption of bridging the popular digital divides in the accessibility and use of information and technology resources, ability of the e-voting to influence political participation largely depend on rational choice of the voter facilitated by a number of incentives motivating voter to cast a ballot. These motivators include electoral costs (involving registering to vote, sorting out information and deciding how to vote, and then actually casting a ballot).

"Citizens are assumed to be rational, meaning they vote if the benefit exceeds the cost" (Matsusaka, 1995, p 91). Rational choice theories have considered human as rational beings (in this case, rational voter) that make preference of using voting system after careful analysis of the outcome of such decision is adjudge to be more beneficial economically, socially and politically. Proposition by diffusion of innovation theorists suggests that five constructs influence behavioral decision to adopt (e-voting) (Rogers, 1983).

Demonstrated by our findings, when citizens adjudge a voting system to have high costs of election either by imposing procedural hurdles in the voting process and or being porous that can be manipulated to temper with the outcome of the elections, the less likely to participate in the election. Studies of e-voting system across countries suggest that so long e-voting "prevent electoral fraud, improve vote-counting, and make elections more representative" (Norris, 2002, p 2), likely the technology entices more people to vote. In

another word, e-voting system is likely to encourage voter turnout if a voter perceives it to marginally reduce the costs of voting, make available relevant information for citizens to decide how to vote, and feels that the security, secrecy and integrity of the system would enable democratic politics (credible and transparent elections).

Extant literature highlighted on how existing paper ballot system imposes obstacles and fatigue on voters including long queue, spending a whole day or two trying to vote, psychological depression resulting from missing names of eligible voters, ballot cancellation spoiled by thumb printing ink, intimidation of voters by thugs, snatching and diversion of voting materials etc. The perception that paper ballot voting increases the costs of election affects voter cognitive behavior towards usage of the voting system and consequently imposing deterioration in voter turnout.

Based on the results of our hypotheses supported by in-depth interviews of our respondents, cognitive perceptions of voters suggest preference in using innovative voting system, e-voting. This is sequel to perception of appealing attributes of e-voting system as capable of improving efficiency and simplification of election procedures; facilitate accuracy and better records management; save time and efforts including comfort in use, enhance timely release of results all of which present the technology as mechanism of reducing costs of voting as postulated by innovation diffusion theorists.

In addition, institutional trust in the form of confidence and trust voter develops in the e-voting system is grounded in theoretical proposition that security, secrecy, reliability, accuracy, efficiency, equality and integrity of e-voting system facilitates democratic politics and transparent elections. Thus, by ensuring actual votes cast determine the

election outcome; reduce human errors in compilation and computation of results as well as in curbing rigging and manipulative tendencies.

However, there are complementary interdependent relations between credibility of voting system and institutional trust to an extent that voting system in itself cannot influenced voter participation decision without requisite trust in the political institution responsible for managing the elections. A study on factors affecting voters turnout in advanced countries of established democracy suggests that impact of voting facilities in influencing voters turnout is far less when compare with the role of institutions and legal rules (Norris, 2002).

On the premise of this theoretical postulations and despite variability of adoption preference of the citizens based on education and income divides, it is hope that e-voting system adoption in Nigeria in complementary with institutional trust would lead to increase voting participation and in the long run, voter turnout. Our findings validating the basic assumption embedded in the rational choice theory, diffusion of innovation theory and institutional trust model.

Based on the evidence presented in this study, the digital divides in accessibility and affordability of technological gadget including internet suggest that e-voting system can be a mechanism of increase voting participation when considered as supplementary to the existing voting system than a complete replacement until the digital divides closes and unequal access become less problematic.

At the instant of this study, quantitative inquiry on factors influencing participation in electin using e-voitng system as well as exploring other factors imposing decrease in voter

turnout from qualiatative standpoint established inter-theory relationships between political science based participation theory, technology based theory of innovation diffusion, institutional trust model and socio-psychological frameworks. The rational choice models providing adequate playing ground for the explanations of determinants of individual voting participation using integrative views of diffusion of innovation theory, institutional trust and socio-psychological frameworks.

While traditional rational choice approach to voting participation provides theoretical proposition for explaining determinants of individuals' rational decision, innovation diffusion theory provides relevant technological variables on citizens' preference to participate in elections using e-voting system over paper ballot method. Institutional trust model provides a basis of plausible explanations that individual rational decision to participate hinges on whether trust and confidence repose in the institutional structure, abstract rules and personalities are capable of producing credible voting outcome or not. Also, nested within the integrative views of rational choice approach, socio-psychological model, which implies individuals' assessment of the compatibility of the democratic process (election) with their own personal capabilities; beliefs, norms and values.

7.8 Theoretical Contributions

Assessment of individual rational decision to participate in election using e-voting system as a sub-discipline of e-government and e-participation is an emerging research area. Adding to this, voter turnout in relations to e-voting is a multidisciplinary research area that warrant eclectic use of research methods and theories (Holden & Karsh, 2010;

Taherdoost & Masrom, 2009). Having considered the multidisciplinary orientation of this emerging research area, this study demonstrated relationships between rational choice theory of participation, a political science based theory (Silberman & Durden, 1975; Simon, 1979, 1982) with theories from technology adoption discipline (Rogers' 1983 – DoI), socio-psychological, (Bandura, 1977) and institutional trust model (McKnight, 2002). The combined theories add to our understanding of the role of technological variables, socio-psychological variables and trusting variables as determinants of socioeconomic oriented theory of participation, rational choice approach. This is considering the relevance of the theories and models in explaining voting participation using e-voting system in Nigeria. The study therefore demonstrated relationships between political science discipline with theories and models from technology management, socio-psychological and trust.

Focusing on relevance theoretical perspective to plausible explanation of human behavior, this study contributed to the body of knowledge by integrating technological attributes (Moore & Benbasat, 1991), trusting constructs (McKnight, 2002) and self-efficacy variables (Bandura, 1977). Without disputing previous traditional rational choice theories of participation, this research model and results contribute significantly to theoretical understanding of the factors that influence individual decision to participate in election using e-voting system. This is considering the added explanatory power of combining rationality, technological attributes, trusting constructs, socio-psychological factors as well as the centrality of the role of perceived relative advantage in the equation of technological attributes as determinants to participate in election using e-voting system.

Stemming from the theoretical base within integrative view of rational choice, we develop a theoretical framework blending DoI, computer self-efficacy and trust model with political science oriented theory, rational choice framework. Introducing mediating role of perceived relative advantage in the relationship between the technological attributes, the study extended the traditional understanding of sequence, order and interrelationship between technological attributes advocated by the proponents of DoI theory.

Another contribution, this study establishes a more concise set of constructs as better predictors of intention to participate in election using e-voting system. With mediation of perceived relative advantage, the key variables trust in the technology, perceived observability and perceived trialability showed strong effect in their influence on intention to participate than do traditional direct effect of technological characteristics and related operational research variables on intention to adopt. Results of our model suggest the relevant of perceived relative advantage variables as mediator for increasing voter intention to participate. In addition to DoI constructs, our model demonstrated the relevance of computer self-efficacy, trust in the technology, trust in the electoral government officials and trust in politically elected government officials as reasonably predictive constructs for increase voting participation, which is not reflected in previous technology adoption models.

Theoretically, the study introduced and validated dichotomous viewpoint about the institutional trust – trust in the government officials. Amazingly, the findings supported the distinct perception of citizens concerning trust in the electoral government officials and trust in politically elected government officials. While trust in the electoral government

officials was significant predictor of intention to participate, as a model, trust in politically elected government officials was not significantly related to intention to participate.

From the qualitative viewpoint, our study extended understanding of the factors with the potential to imposing decrease in voter turnout in a drive to use e-voting parallel with their remedies, which laid a foundation for potential theorizing.

Having combined qualitative and quantitative research design in a single study, we investigated various aspects of the complex system comprising of discrete components of the technology; trusting variables as well as institutional, socio-psychological and infrastructural-based factors that form an integral part of rational choice explanation of decision to participate in election using e-voting system. The fact that existing researches on e-voting focus considerable attention to addressing discrete technological issues, our research focus on how attributes of e-voting system influence citizen voting participation.

7.9 Methodological Contributions

Proving the power of triangulation mode of research, extending determinants of individual rational decision to participate in voting beyond discreed quantitative variables of DoI, trust and computer self-efficacy constructs to emcompasses institutional, socio-psychological and infrastructural based factors demonstrated unique findings that otherwise might not be achieved if either of the two methods was solely adopted. In addition, the mixed method provides extended view on understanding related variables and themes. For example, quantitative analysis revealed that trust in the politically elected government is not significant predictor of intention to participate. In contrast, qualitative

indicators showed citizens' concern about trustworthiness of both electoral government officials and politically elected government officials as strong factors with potential implication of influencing voter cognitive decision to participate. The construct, trust in the politically elected government officials can be reconceptualized further and investigated for possible bridge of the seeming disparity.

Given the scarce empirical research in the field of public administration, the study empirically test and validated relationships between technological attributes, socio-psychological variables as influential factors that have impact on individual rational decision to participate in elections using e-voting system. It also demonstrated the relevance as well as power of PLS-SEM approach to modeling and disseminating modern public administration research.

7.10 Practical Contributions

In a practical sense, the study can be a useful treatise to policy makers, researchers and practitioners towards understanding the implications of technology inclined voting participation. Having discussed in details how various socio-technological, institutional, socio-psychological and infrastructural factors influence individual rational decision, the study can be a viable reference towards effective voting policies that seeks to maximize the benefits of mass citizens' participation in Nigeria and other countries with similar voting antecedents. The study therefore provides a solid foundation for policy formulation, planning and coordination of development strategies towards successful transition to e-democracy, institution building and democratic consolidation that would propel principle of good governance and socio-economic development.

Our study provides empirical evidence on significance of technological attributes that are appealing to individual rational decision to use e-voting system in election and hence, an important document for election practioners such as electoral administrators to explore strategies and programs towards maximizing the power of discreet socio-technological factors in order to encourage voting participation through e-voting system adoption. Against this backdrop, industrialists would find this study a source to reckon in ensuring technological design and style of the proposed e-voting system such as interface options, language, accuracy, speed, time and effort saving, security, privacy, etc conform to the needs of the end users (voters).

Our study has statistically revealed significant mediating impact of relative advantage capable of transferring the effects of technological variables; trust in the technology and computer self-efficacy on intention to participate. Management of INEC and other election stakeholders should employ strategies to unveil the benefits of using e-voting system over existing paper ballot method as incentives for voting participation using the former. As powerful incentives to encouraging voting participation, potential voters should be exposed to various domains of e-voting system benefits including economic benefits, image enhancement, convenience, and satisfaction. From economic viewpoint, adopting e-voting system helps in cutting down huge costs of production and save wastages incur by paper ballot system. Other motivation for e-voting adoption includes time saving, social benefits and hazard avoidance (Moore & Benbasat, 1991).

In line with the identified domain-based factors influencing voting participation, INEC and other voting stakeholders should consider initiating programs that would strengthen institutional capacity and adequate provision of requisite facilities, which are consider as

having effect on citizens decision to participate in election. In addition, being a scientific inquiry that investigates selective incentives by individuals to participate in voting, individuals, community based organizations and civic societies in Nigeria would find this study useful to press-demand for fulfilment of the conditions for mass participation in election including institutional, technological and infrastructural structures and facilities.

7.11 Limitations and Future Research Direction

It is close to impossible to exhaust detailed preview of potential future research areas given the wide range scope of the research study. In the light of limitations of the study, directions for future investigations are provided.

In accordance with DoI theory, five characteristics of technological comprising of perceived relative advantage, perceived trialability, perceived observability, complexity and compatibility affect intention to adopt (Rogers, 1983). This study established mediating relationship of perceived relative advantage in the attributes of technology. However, absence of preceding voting technology in Nigeria rendered perceived compatibility not a relevance variable, nonetheless an important factor influencing voters' intention to participate. Non-inclusion of perceived compatibility in this study suggests existence of gap in the model. Therefore, future studies should consider incorporating perceived compatibility in the model.

Complementary to this, our study adopt mixed methods in which both qualitative and quantitative data were utilized. Combining qualitative and quantitative research approach nonetheless provides insight to understand social phenomenon (Venkatesh, Brown, &

Bala, 2013), affect in-depth to which concepts are discussed. More in-depth investigation of the qualitative model developed in this study will be required for deeper understanding of the concepts and theorizing.

On the other hand, our study analysed perceptions of the respondents based on income and educational status. Given the heterogeneous nature of potential voters alone other other demographic variables such as gender, age, belief systems, rural-urban dichotomy and internet use as essential characteristics of digital divides. Investigating differences in perception of the citizens alone those demographic lane is worthy (Belanger & Carter, 2010b; Helbig, Gil-García, & Ferro, 2005; Powell et al., 2012). In addition, having drawn the sample of this study mainly from the northeast zone, the results may not stand a test of generalization. Drawing sample beyond geographical enclave of Northeast to other geopolitical regions and states should be considered in future studies for more inclusion and potential generalization.

Another essential point to mention is that the sample used in our qualitative inquiry covered only voters, electoral officials and party officials. The study did not covered opinions of elected politicians (e.g. members of parliament), security agents (e.g. police, civil defense cops), civic society organizations, media groups, and judiciary who are equally important election stakeholders (UNDP, 2011). Sampling opinions of those stakeholders would proivde in-depth understanding of potential challenges and remedy to voter turnout in a drive to adopt e-voting system. Therefore, future investigations should expand the sample to cover those groups of stakeholders. It could be observed that our qualitative analysis were based on domain specific that open up for potential theorizing. Future studies should align the model to relevant theoretical based.

Demography such as age, gender, cultural background and belief system etc. as one of the factors that distinguish individuals' adoption rate is not being captured by this study. Understanding moderating effect of demographic variables would providing first-hand information to policy makers and practitioners on differential needs as well as sensitivity of various segment of the community. Future studies should therefore consider including moderating effect of demographic variables in the model for more specific adoption variance among various segment of society. For sustainable ICT initiatives in developing countries, research in developing countries should as a matter of importance, distinguish itself contextually and through problematization of the developmental role of innovation adoption (Avgerou, 2008).

Data for this study were collected at the spring time of 2014 when the proposed e-voting adoption was at the midway of executive pressure and legislative deliberations. The proposed use of e-voting system failed to secure legislative approval and subsequently, INEC introduced card reader method of voters' verification. Being first of its kind inNigerian election in which card reader is used, an incumbent president and his party was depeated in most states across the federation (Durotoye , 2015) and the elections was adjudged the most free, fair and credible that reflect the wishes of the citizens (Mahmud, 2015) . It is therefore believed that the card reader experimentation might have significant effect on election participation using e-voting system. Thus, investigating intention to participate in elections using e-voting system in post-2015 elections is pertinent in order to assess possible differences with pre-2015 elections.

7.12 Conclusion

In constract to the existing models of voter participation that viewed individuals rational choice from group based mobilization perspective, focusing on what a voter receives from leaders (Uhlaner, 1989; Morton, 1987, 1991); consumption benefits derive from voting participation such as fulfilling one's civic obligation (Riker & Ordeshook, 1968); voter ability to influencing the outcome of election (Ledyard, 1981, 1984); voting as costless game (Feddersen & Pesendorfer, 1999), our study introduces model of voting participation recognizing technological attributes, socio-psychological efficacy, trust in the technology and in the political institutions as the key determinants of decision to participate. Our model also takes into cognizance voter trust and confidence in the democratic institution, and infrastructural facility. In essence, technological attributes of e-voting present themselves as important factors appealing to influence cognitive behavior of a voter to make e-voting a preferable voting option.

Introducing new perspective of, and as departure from traditional e-voting adoption approach, our model extends technological attributes of DoI, computer self efficacy and trusting variables beyond mere e-voting adoption to election participation ladder. In addition, the existing approaches often empphasised exogenous and endogenous costs and benefits from socio-economic perspective, whereas our study amplifies rational voter decision to participate from socio-psychological perspective using input from technological forces and political institutions as costs and benefits.

Buttressing the proposition, in as much as voter develops trust and confidence in the reliability, accuracy and integrity of a voting system, the more likely to believe in credibility of the process to enhance transparent democratic election (free and fair) as an

important condition to participate in election. This translates to mean that voter perception of e-voting as dependable mechanism capable of reducing difficulties in the process of voter registration and in voting would influence his/her decision not only to adopt e-voting system but also participate in elections using the system. Our model therefore extends the rational choice theory of voting participation nesting attributes from innovation diffusion theory and institutional trust.

It is worthy to emphasise that participation in election cannot be treated in isolation from other important aspects of political process. Impact of voting system on voting participation decision nonetheless, our model takes into cognizance several other factors that influence cognitive decision of a voter to participate in elections. At the instant of this study, factors influencing voter cognitive decision to participate in election could be categorized into six broad classifications. Thus, voter trust and confidence in (i) democratic/political structures (including political instititons, electoral management body, government officials, security agents; party officials, courts); (ii) adequate physical infrastructure/facilities (including elections equipment, technologies, requisite infrastrucrure); (iii) intergrity of the election process to ensure democratic election (one person, one vote); (iv) credibility of the voting process; (v) abstract rules and regulations (including constitutionalism, rule of law guiding the conduct of the electoral stakeholders); and (vi) sociological factors (including age, ethnoreligious affiliation, social influence, membership of association).

e-Voting system is an importance mechanism that facilitates citizens confidence in the credibility of the voting process. However, the degree to which voter confidence in the voting process influences his/her participation decision may be insignificant in view of other important factors such as the roles played by the political institutions, adherence to

rule of law, perceived outcome of the election on good governance, and adequate infracturactual facilities. It can be deduced that election materials, sensitive and non-sensitive including election technologies are subject to the dictate of electoral officials. As such, even the e-voting system is a mere tool in the hand of electoral officials, and hence, the impact of e-voting system cannot be observed independent from the important institution. In this case, trust and confidence in the e-voting system as enhancer of credible voting process without commensurate trust and confidence in the electoral instituions including the officials responsible for handling the system may not be very significant.

Experiences with e-voting adoption in connection to increased voter turnout in countries of developed democracy, some of them having hard times with the technology while others having records of success notwithstanding, e-voting adoption is a Pandora box. The different experiences with e-voting adoption is largely due to levels of country's socioeconomic, political and technlogical development including individual peculiarities such as how wide or close is the social gap (digital divides).

In most cases, countries of developed democracy deployed e-voting to complement the existing democratic structures such as accountability, transparency, constitutionalism, institutionalism, rule of law, good governance, including e-government structures (technological facilities). In such countries with manifest democratic structures, e-voting is a democratic superstructure adopt to further entrench democratic participation by enhancing accessibility, convenience, ease of use etc. However, the case is not similar with most e-voting initiatives in developing societies of Africa such as Nigeria where many of the fundamental democratic structures are either weak or nonexistence. In such socieites, institutional decay is evident; public officials are hardly held accountable of their actions

and inactions; political including administrative corruptions and impunity become daily routines; whereas judicial independence is at stake exposing vulnerable citizens to high costs of justice as only few rich members of the society can afford justice.

The unfortunate situations in such societies fulfilled all the conditions of citizens' distrust and lost of confidence in the government including the democratic institutions. Attempt to impose e-voting system void of fundamental democratic structures translates into pursuing superstructure in the absence of the real structures, which is a demonstration of gross misplacement of priority. Nonetheless existent digital divides among socities, e-voting adoption can be a mechanism for increasing voter turout when foundamental democratic structures including e-government facilities are adequately provided. In essence, it takes a voter to develop trust and confidence in the various aspects of a political system in order to influence elections participation significantly.

Two folds of determinants of increasing voter turnout in particular and political participation in general from voter cognitive perspective are evident. Firstly the fundamentals, which entails citizens' trust and confidence in the electoral process. It requires citizen's satisfaction in the roles play by the political institutions, the extent to which election stateholders conform with the electoral rules and regulations, adequate provision of requisites technological and infrastructural facility, and effective machinism for holding public office holders accountable to citizens. Secondly the superstructure, which entails voter perception of credibility of the voting process as a mechanisim of reducing voting costs (including ease of use; accessibility, convenience time and effort savings) and ensuring democratic election (e.g. prevent riging and other manipulation).

Conclusively, although technological factors proved to have indirect effect on voters' participation in election, such influence is not enough to cause the needed voters' turnout. Being insignificant factor to address the insurmountable challenges of decrease in voter turnout in Nigeria with far reaching implications of loss of trust and confidence in democratic institutuins, cognitive decision of voters suggests that addressing the challenges of decreasing voter turnout requires holistic approach that seeks to integrate various domain-based factors including institutional, socio-psychological, technological and infrastructural. It requires strategies aimed at builting citizens' trust and confidence in the entire electoral process as well as making them appreciate the value of elections in bringing about good governance. This, in essence suggests that policy makers should pay attention to not only enhancing credibility of voting process by adopting e-voting system but also address other critical institutional and e-government factors that influence cognitive decision of voter to participate in election.

The reciprocal implications of improved voter turnout imply higher citizens' trust and confidence in the democratic process as viable system for ensuring democratic leadership, a condition for good governance and democratic consolidation. Furthermore, improved voter turnout entrenches the principles of inclusive government; transparency and accountability of public officials.

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Appendix A: Adapted Items

Table A1

Adapted Items

Construct/Items	Cronbach α	Composite Reliability	Sources
Participation Intention (ITP)			
ITP1. I plan to participate in the future election using e-voting system. ITP2. I intend to participate in the future election using e-voting system. ITP3. I expect to participate in the future election using e-voting system.	.88	.82	Lin (2006)
Perceived Trialability (TRB)			
TR1. Before deciding on whether or not to use the e-voting, I would need to use it on a trial basis. TR2. Before deciding on whether or not to use the e-voting, I would need to properly try it out. TR3. I would be permitted to use the e-voting on a trial basis long enough to see what it can do. TR4. Before deciding whether to use any types of e-voting, I would be able to properly try them out. TR05. I would have a great deal of opportunity to try various e-voting technologies.	.85		Park and Chen (2007); Moore and Benbasat (1991)
Perceived Observability (OBS)			
OBS1. I believe I would have no difficulty telling others about the results of using e-voting. OBS2. I believe I could communicate to others the outcome of using e-voting. OBS03. I believe I would have no difficulty explaining why using e-voting system may or may not be beneficial. OBS4. I believe the instructions of how to use e-voting is available and visible in many places.		.80	Al-Busaidi (2012); Meuter, Bitner, Ostrom, and Brown (2005)

OBS5. The results of using the e-voting would be apparent to me.			
Construct/Items	**Cronbach α**	**Composite Reliability**	**Sources**
Perceived Ability to Use (PATU) PATU1. I believe to interact with e-voting system is easy for me. PATU2. I believe the e-voting is flexible to interact with. PATU3. I believe it is easy to operate e-voting. PATU4. I believe interactions with the e-voting system are clear and understandable. PATU5. I can easily do my tasks while using the website. PATU6. I believe it is easy to cast vote using e-voting system.			Shareef, Kumar, Kumar and Dwivedi (2011)
Perceived Relative Advantage (RA) RA1. I have a belief that using e-voting enables me to vote more quickly. RA2. I believe that using e-voting improves the quality the election. RA3. I believe using e-voting makes it easier to cast my vote. RA4. I predict using e-voting can enhance accuracy of my voting. RA5. I believe Using e-voting can offer me greater control over my vote.	.90		Moore and Benbasat (1991)
Trust in the Technology (TIT) TIT1. I have a perception that the technology has enough safeguards to make me feel comfortable using it to vote. TIT2. I feel assured that legal and technological structures will adequately protect me from problems using e-voting. TIT3. I trust that vote cast using e-voting will be accurately counted. TIT4. I have a perception that e-voting will be safe enough for voting.		.96	Powell et al. (2012)

TIT5. I should trust the security of e-voting system. TIT6. I trust that vote cast using e-voting will not be tampered with.			
Trust in Electoral Government Officials (TEO) TEO1. I feel that electoral officials act in citizen's best interest. TEO2. I feel fine interacting with the electoral officials since they generally fulfills their duties efficiently. TEO3. I always feel confident that I can rely on electoral officials to do their part when I interact with them. TEO4. I am comfortable relying on the electoral officials to meet their obligations.		.91	(Teo, Srivastava & Jiang 2008 as adapted from McKnight, Choudhury & Kacmar, 2002)*
Trust in Elected Government Officials (TPO) TPO1. I think I can trust elected government officials. TPO2. Elected government officials can be trusted not to interfere in the conduct of election. TPO3. I am confident that the elected government officials relate good with the electoral officials in accordance with election guidelines. TPO4. In my opinion, elected government is trustworthy.	.75		Alomari et al. (2012); Powell, Williams, Bock, Doellman and Allen (2012)
Computer Self-efficacy (CSE) CSE1. I would find it easy using e-voting without having computer skills. CSE2. It is not easy for me to understand benefits of e-voting without having the required skills to use it. CSE3. I have the computer skills which enable me to use e-voting system. CSE4. Having the computer skills will improve my understanding of e-voting system. CSE5. Having the computer skills will enable me to assess the e-voting system.			Alomari et al. (2012)

Appendix B: Questionnaire

University Utara Malaysia (UUM)

College of Law, Government and International Studies (COLGIS)

Ghazali Shafie Graduate School of Government (GSGSG)

06010 UUM Sintok, Kedah Darul Aman

Dear Respondent,

For more than a decade, elections in Nigeria is characterized with irregularities of different shapes and magnitudes including multiple voting, under aged voting, miscomputation of results, intimidation of voters, etc. Use of traditional paper voting system is hypothesized to be among other major cause of election problems in Nigeria. The government is therefore planning to introduce electronic voting (e-voting) system in order to enhance free, fair and credible public elections. However, deployment of modern voting technology to replace traditional voting system could be meaningful only if citizens such as your humble self are willing to accept the technology. This study is therefore aim **to examine the factors affecting voters' intention to participate in public elections using e-voting technology**. Attached herewith a self-explanatory survey questionnaire designed to sample your opinion about the proposed government project. Your sincere participation would help to build genuine citizens' opinion that will serve as a guide to policy makers in making strategic decisions concerning the desired voting system. I am therefore soliciting for your cooperation to kindly provide objective answers to all the questions in this survey. The survey is part of Doctor of Philosophy (PhD) study being undertaken by the researcher who is a student at Universiti Utara Malaysia (UUM). Meanwhile, be assured that all the information you provide will be handled with utmost confidentiality and use only for the purpose of this research study. You are therefore advised not to write either your names or names of your organization on the questionnaire, please.

Thank you very much for your anticipated cooperation.

Yours sincerely

Sabo Ahmad

Mobile: +234 803 939 5404 (Nigerian)

+60 147 445 183 (Malaysian)

e-mail: ahmadsabou@yahoo.cm

s94516@student.uum.edu.my

Note: The survey is broadly divided into Section A and Section B. Section A is subdivided into 5 parts. In each of part I – V, you are required to **tick (✓)** an appropriate column provided with options from Strongly Disagree-1, Disagree-2, Neutral-3, Agree-4 to Strongly Agree-5. Section B contains demographic information.

SECTION A:

Part I: Perception on Intention to Participate Using e-Voting System

Please **tick (✓)** between Strongly Disagree-1 to Strongly Agree-5 that matches your view or level of agreement most for each question.

1=Strongly Disagree	2=Disagree	3=Neutral	4=Agree	5=Strongly Agree

		1	2	3	4	5
A1	I plan to participate in the future election using e-voting machine.					
A2	I intend to participate in the future election using e-voting machine.					
A3	I expect to participate in the future election using e-voting machine.					

Part II: Perception on e-Voting Characteristics

The following statements describe your perception towards e-voting characteristics. Please **tick (✓)** between Strongly Disagree-1 to Strongly Agree-5 that matches your view or level of agreement most for each question.

		1	2	3	4	5
B1	I have a perception that using e-voting enables me to vote more quickly.					
B2	I have a perception that using e-voting can improve the quality of the election.					
B3	I have a perception that using e-voting will be easier for me to cast my vote.					
B4	I predict using e-voting can enhance accuracy of my voting.					
B5	I have a perception that using e-voting can offer me greater control over my vote.					

1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

		1	2	3	4	5
C1	Before deciding on whether or not to use the e-voting, I will need to use it on a trial basis.					
C2	Before deciding on whether or not to use the e-voting, I will need to properly try it out.					
C3	I should be permitted to use the e-voting on a trial basis long enough to see what it can do.					
C4	Before deciding whether to use any types of e-voting, I will be able to properly try them out.					
C5	I would have a great deal of opportunity to try various e-voting technologies.					

		1	2	3	4	5
D1	I have a perception that I will have no difficulty telling others about the results of using e-voting.					
D2	I have a perception that I could communicate to others the outcome of using e-voting.					
D3	I have a perception that I will have no difficulty explaining why using e-voting system may or may not be beneficial.					
D4	I have a perception that the instructions on how to use e-voting will be available and visible in many places.					
D5	I have a perception that the results of using the e-voting will be apparent to me.					

Part III: Perception on Trust in e-Voting System

The following statements describe your trusting perception on e-voting system. Please **tick** (✓) between Strongly Disagree-1 to Strongly Agree-5 that matches your view or level of agreement most for each question.

		1	2	3	4	5
E1	I have a perception that the technology has enough safeguards to make me feel comfortable using it to vote.					
E2	I feel assured that legal and technological structures will adequately protect me from problems using e-voting.					
E3	I trust that vote cast using e-voting will be accurately counted.					
E4	I have a perception that e-voting will be safe enough for voting.					
E5	I should trust the security of e-voting system.					
E6	I trust that vote cast using e-voting will not be tampered with.					

1=Strongly Disagree **2=Disagree** **3=Neutral** **4=Agree** **5=Strongly Agree**

Part IV: Perception on Trust in Government Officials

The following statements describe your perception of trust in electoral officials. Please **tick** (✓) between Strongly Disagree-1 to Strongly Agree-5 that matches your view or level of agreement most for each question.

		1	2	3	4	5
F1	I feel that electoral officials act in citizen's best interest.					
F2	I feel fine interacting with the electoral officials since they generally fulfills their duties efficiently.					
F3	I always feel confident that I can rely on electoral officials to do their part when I interact with them.					
F4	I am comfortable relying on the electoral officials to perform their obligations.					

The following statements describe your perception of trust in elected government officials. Please **tick** (✓) between Strongly Disagree-1 to Strongly Agree-5 that matches your view or level of agreement most for each question.

		1	2	3	4	5
G1	I think I can trust elected government officials.					
G2	Elected government officials can be trusted not to interfere in the conduct of election.					
G3	I am confident that the elected government officials relate good with the electoral officials in accordance with election guidelines.					
G4	In my opinion, elected government officials are trustworthy.					

Part V: Perception on Computer Self-efficacy

The following statements describe your perception to computer self-efficacy. Please **tick** (✓) between Strongly Disagree-1 to Strongly Agree-5 that matches your view or level of agreement most for each question.

		1	2	3	4	5
H1	I would find it easy using e-voting if I have computer skills.					
H2	It will be easy for me to understand benefits of e-voting if I have computer skills.					
H3	If I have computer skills, it will enable me to use e-voting system.					
H4	Having the computer skills will improve my understanding of e-voting system.					
H5	Having the computer skills will enable me to assess the e-voting system.					

1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

Part VI: Perception on Ability to Use e-Voting System

The following statements describe your perception regarding ability to use e-voting system. Please **tick (✓)** between Strongly Disagree-1 to Strongly Agree-5 that matches your view or level of agreement most for each question.

		1	2	3	4	5
J1	I have a perception that interaction with e-voting system will be easy for me.					
J2	I have perception that e-voting will be flexible to interact with.					
J3	I have a perception that it will be easy to operate e-voting.					
J4	I have a perception that interactions with the e-voting system will be clear and understandable.					
J5	I have a perception that I can easily cast my vote using e-voting.					

SECTION B

Demographic Information: Please Tick (✓) Only One option as applicable

1. **Gender**

i□Femal ii□Male

2. **Educational Background**

i□ Secondary/Primary Certificate ii□ ND/OND iii□ Bachelor Degree/HND

iv□ PhD/MSc v□Nonformal vi□Others (Specify) _ _ _ _ _ _ _ _ _ _ _

3. **Age**

i□18- 25 yrs ii□26- 35 yrs iii□36- 45 yrs iv□46- 55 yrs v□above 55 yrs vi □Others (specify) _ _ _ _ _ _ _ _ _ _ _

4. **Residence** _

5. **Average Monthly Income**

i □ Less than N18,000 ii.□N18,000 to N50,000 iii. □N51,000 to N100,000
iv□N101, 000 to N200,000 v. □ above N200,000
vi□Others (Specify amount)_ _ _ _ _ _ _ _ _ _ _

1=Strongly Disagree **2=Disagree** **3=Neutral** **4=Agree** **5=Strongly Agree**

6. Computer Proficiency/skills

i ☐I can handle basic operation of computer such as Microsoft office
ii ☐ I have advanced skills of computer operations including internet surfing
iii ☐ I am a computer professional
iv ☐ I don't have computer skills
v ☐Others (explain) _ _ _ _ _ _ _ _ _ _ _ _

7. How many times did you participate in National Election?
☐1 Time ☐2 Times ☐ 3 Times ☐ 4 Times ☐ Others (Specify) _ _ _ _ _ _ _ _ _ _ _ _

1=Strongly Disagree **2=Disagree** **3=Neutral** **4=Agree** **5=Strongly Agree**

Appendix C: Interview Protocol

BRIEF INFORMATION ON THE RESEARCH

Dear (Sir/Madam)

Traditional paper-based voting system is characterized with many irregularities leading to general public dissatisfaction and outcry. e-Voting system is a technological innovation in form of ATM like, Kiosk, Punch card, or through wireless network such as internet, and fixed telephones that can be utilized by the government to overturn problems of paper-based voting system. It could be deploy to enhance free, fair and credible public election and therefore has the potential to increase political participation. However, to introduce e-voting as an alternative replacement to the traditional method of voting requires research study that would help strategic planning.

In order to achieve the desired goals, the researcher is conducting stakeholder interviews for about 30 minutes such as your humble self, who are in a position to provide valuable information on the proposed e-voting projects for current and future plans. In this regards, we would like to invite you to be part of this study, which will assist the researcher to identify potential challenges and solutions to participation in election using e-voting system. It's expected that information gained from this research study will provides the decision makers with better understanding of the challenges for better planning and implementation.

I assure you that all information and identities will remain confidential and treat only for the purpose of this research. Could I ask you please to complete the attached Consent Form prior to our interview?

Thank you in anticipation of your participation.

Yours sincerely,

Sabo, Ahmad

CONSENT FORM FOR INTERVIEWEE PARTICIPANTS

INFORMATION TO PARTICIPANTS:

We would like to invite you to be a part of Doctor of Philosophy study into 'e-Voting System Adoption and its Impact on Voter Turnout in Nigeria'.

This survey is part of Doctor of Philosophy study, being undertaken by the researcher, Sabo Ahmad and supervised by Ass. Prof. (Dr.) Siti Alida John Bt Abdullah and Dr. Rozita Bt Arshad at Universiti Utara Malaysia (UUM). The objective of this study is to explore factors with potential to imposing decrease participation in elections using e-voting system. This study will assist the decision makers to better understand the complexities involved in e-voting adoption in order to ensure current and future plans are in the right direction and according to the citizen's needs. Semi-Structured interviews is part of the primary data collection tools that will be used in this study. The interview will be taped and notes taken with full consent of the participants for accuracy of information. The information gathered will be treated with utmost confidentiality along with the identity of the participants. The anonymity and confidentiality of participants and information collected from them will be ensured through important steps outlined below.

CERTIFICATION BY PARTICIPANT

I, _____ of _____
_____ certify that I am above 18 years old and that I am voluntarily giving my consent to participate in the study 'E-Voting System Adoption and its Impact on Voter Turnout in Nigeria'.

I certify that the objectives of the study, together with any risks and safeguards associated with the procedures listed hereunder to be carried out in the research, have been fully explained to me by Sabo Ahmad, and that I freely consent to participate agrreing with the procedures mentioned below:

- I am participating voluntarily.

- The interview will be audio taped and notes taken.
- The interview will take place in _
- The information gathered from me will be kept confidential along with my identity.
- The anonymity and confidentiality of information collected from me as participant will be ensured.

I certify that I have had the opportunity to have any questions answered and that I understand that I can withdraw from this study at any time and that this withdrawal will not jeopardize me in any way.

Signed:

Date:

NOTE: ***If you have any queries or complaints about the way you have been treated, you may contact the Secretary, Ghazali Shafie Graduate School of Government, College of Law, Government and International Studies, Universiti Utara Malaysia (UUM), PMB 06010 Sintok, Kedah Darul Aman, Malaysia, Tel: (+604) 9286601/6613, or email: yus1117@uum.edu.my***

SEMI-STRUCTURED INTERVIEW QUESTIONS FOR QUALITATIVE DATA COLLECTION

Note: The main questions are listed below. However, this is a semi-structured interview and it is anticipated that more questions may be asked based on the interviewee responses.

Demographic Information

□ Gender: Male/Female □ Age _____ □ Marital Status _____

□ Education level _____ □ Computer literacy _____

□ Occupation _____ □ Position _____

□ State _____ □ Residence _____

General Questions

1. How would you describe problems of Nigerian elections in relation to inappropriate method of voting?
2. How would you describe plan by the government to introduce e-voting system in near future elections?
3. How would you describe the proposed introduction of e-voting system in relation to encouraging participation in elections?
4. How would you describe potential challenges to acceptance of e-voting system by the citizens?
5. What in your opinion are possible solutions to the potential problems of the proposed e-voting?

Appendix D: Demographic Profile of Interviewees

Table F1

Detailed Demographic Profile of the Interviewees

Category	Designation	Gender	Age Bracket	Education Level	Income level	Res	Computer literacy
Voter 1	-	Male	31 – 45	Higher Qualification	High Income	Urban	Basic Computer Skills
Voter 2	-	Male	18 – 30	Lower Qualification	Average Income	Rural	No Computer Skills
Voter 3	-	Female	31 – 45	Higher Qualification	High Income	Urban	Basic Computer Skills
Voter 4	-	Male	46 and above	Higher Qualification	High Income	Urban	Advanced Computer Skills
Voter 5	-	Male	31 – 45	Zero Qualification	Low Income	Rural	No Computer Skills
Voter 6	-	Female	31 – 45	Lower Qualification	Low Income	Urban	No Computer Skills
Voter 7	-	Male	18 – 30	Higher Qualification	Average Income	Rural	Advanced Computer Skills
Voter 8	-	Male	31 – 45	Zero Qualification	Low Income	Urban	Basic Computer Skills
Voter 9	-	Male	18 – 30	Higher Qualification	Average Income	Urban	Basic Computer Skills
Voter 10	-	Male	18 – 30	Lower Qualification	Low Income	Rural	Basic Computer Skills

Category	Designation	Gender	Age Bracket	Education Level	Income level	Res	Computer literacy
Voter 11	-	Female	46 and above	Zero Qualification	High Income	Urban	No Computer Skills
Voter 12	-	Male	31 – 45	Higher Qualification	Average Income	Rural	Advanced Computer Skills
Voter 13	-	Female	31 – 45	Lower Qualification	Average Income	Urban	Basic Computer Skills
Voter 14	-	Male	18 – 30	Higher Qualification	High Income	Urban	Advanced Computer Skills
Voter 15	-	Male	31 – 45	Zero Qualification	Average Income	Rural	Basic Computer Skills
Electoral official 1	Residence Electoral Commissioner	Male	31 – 45	Higher Qualification	Average Income	Urban	Basic Computer Skills
Electoral official 2	Head of Legal Department	Male	46 and above	Higer Qualification	Low Income	Rural	No Computer Skills
Electoral official 3	Head of Logistic and Transport	Male	18 – 30	Higher Qualification	Average Income	Urban	Basic Computer Skills
Electoral official 4	Head of Computer	Female	31 – 45	Higer Qualification	Average Income	Rural	Advanced Computer Skills
Electoral official 5	Head of Operation	Male	46 and above	Higher Qualification	High Income	Urban	Basic Computer Skills
Electoral official 6	Head of Human Resource Mgt	Male	31 – 45	Higer Qualification	Low Income	Urban	Advanced Computer Skills

Category	Designation	Gender	Age Bracket	Education Level	Income level	Res	Computer literacy
Party official 1	Organizing Secretary	Male	18 – 30	Lower Qualification	Average Income	Rural	Advanced Computer Skills
Party official 2	Vice Chairman	Male	31 – 45	Higher Qualification	High Income	Urban	Basic Computer Skills
Party official 3	Women Leader	Female	46 and above	Lower Qualification	Low Income	Rural	No Computer Skills
Party official 4	Youth Leader	Male	31 – 45	Lower Qualification	High Income	Urban	Basic Computer Skills

Table F2

Interviewees' Response about Challenging Factors with Potential for Imposing Decrease in Voter Turnout using e-Voting System

	Institutional Challenges					Socio-psychological Challenges				Technological Challenges		Infrastructural Challenges	
Respondents	**TEO**	**TPO**	**BPO**	**ConsC**	**TechC**	**Illit**	**CompL**	**DigD**	**BelS**	**InInf**	**Trial**	**ReqF**	**ElecS**
Voter1	1	1			1		1		1	1	1	1	
Voter2	1		1			1	1	1		1	1		1
Voter3	1	1		1			1				1	1	1
Voter4		1			1	1		1		1			
Voter5	1		1	1			1		1	1	1	1	1
Voter6		1			1	1		1		1	1	1	
Voter7	1	1	1				1				1	1	1
Voter8					1	1		1	1	1			1
Voter9	1		1		1		1	1		1	1	1	1
Voter10	1	1				1	1	1		1	1	1	
Voter11	1	1	1		1	1			1	1	1		
Voter12						1	1	1		1	1	1	1
Voter13	1		1	1		1	1				1	1	
Voter14	1								1	1		1	1
Voter15		1	1		1	1	1			1	1	1	
E. Offical1	1		1	1		1	1			1	1		1
E. Official2		1			1			1		1		1	
E. Official3	1	1		1		1			1	1	1		1
E. Official4		1			1		1				1	1	
E. Official5	1		1							1		1	1
E. Official6		1		1	1	1	1			1	1		

P. Official1	1		1		1	1		1		1		1	1
P. Official2		1		1			1		1		1	1	1
P. Official3	1	1		1		1	1	1		1	1	1	1
P. Official4	1		1	1	1	1	1	1	1	1	1	1	

TEO = Trust in Electoral Government Officials; TPO = Trust in Elected Government Officials; BPO = Bureaucratic policy orientation; ConsC = Constitutional control; TechC = Technical capacity; Illit = Illiteracy; CompL = Computer literacy; DigD = Digital divides; BelS = Belief systems; InInf = Inadequate information; Trial = Trialing the technology; ReqF = Requisite facilities; ElecS = Electricity supply

Table F3

Interviewees' Response about Remedy to Potential Challenges of Voter Turnout in a Drive to Adopt e-Voting Systsem

	Strengthening Institutional Framework						
Respondents	**EPF**	**SAL**	**AII**	**EID**	**ATAV**	**IIMP**	**ARF**
Voter1	1	1	1	1		1	1
Voter2	1		1	1		1	1
Voter3	1	1	1	1	1	1	1
Voter4		1	1		1	1	
Voter5	1		1	1	1	1	1
Voter6		1	1	1	1	1	
Voter7	1		1	1		1	1
Voter8			1	1		1	
Voter9	1		1	1	1	1	1
Voter10		1	1	1		1	1
Voter11		1	1	1	1	1	
Voter12	1			1		1	1
Voter13	1	1	1	1		1	1
Voter14	1		1	1		1	
Voter15			1	1	1	1	1
E. Offical1			1	1		1	1
E. Official2	1		1	1	1		
E. Official3		1		1		1	
E. Official4			1	1	1		1
E. Official5	1		1	1			
E. Official6		1		1	1	1	1
P. Official1	1		1	1	1	1	1
P. Official2	1		1	1		1	1
P. Official3	1	1		1		1	1
P. Official4	1		1	1	1	1	1

EPF = Effective Policy Framework; SAL = Severe Anti-corruption Law; AII = Absolute Independent of INEC; EID = Effective Information Dissemination; ATA = Appealing Technological Attributes; IIMP = Incremental Implementation; ARF = Adequate Requisite Facilities