

**THE DETERMINANTS OF ELECTRONIC VOTING ADOPTION:
INDEPENDENT NATIONAL ELECTORAL COMMISSION OF
NIGERIA EMPLOYEES' PERSPECTIVE**

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**DOCTOR OF PHILOSOPHY
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Abstrak

Perkembangan teknologi telah menjadikan penggunaan teknologi maklumat dan peranti penyokong sangat penting dalam hampir semua aspek kehidupan. Namun, terdapat pengguna yang memilih untuk menolak sistem maklumat yang telah dibangunkan kerana beberapa faktor. Kos penolakan ini akan menjadi tinggi jika tidak dapat diselesaikan. Kajian ini menyelidik faktor penentu yang boleh mempengaruhi kejayaan penerimaan terhadap teknologi mengundi secara elektronik. Hal ini dilakukan dengan membuat kajian tinjauan ke atas perspektif pekerja dalam kalangan kakitangan pengurusan dan operasi suruhanjaya pilihan raya Nigeria untuk mengumpulkan data melalui kajian soal selidik. Berdasarkan kajian lepas mengenai penerimaan teknologi, empat faktor utama penentu atau pemboleh ubah adalah Ketersediaan Teknologi, Ketersediaan Organisasi, Faktor Persekitaran, dan Faktor Faedah yang Diperoleh. Semua faktor tersebut telah dikenal pasti daripada Teori Penyebaran Inovasi, Teori Kerangka Kerja Teknologi-Organisasi-Persekitaran dan model Iacovou et al. (1995) untuk membangunkan satu model penerimaan organisasi terhadap teknologi mengundi secara elektronik. Kajian lepas dalam bidang penerimaan teknologi juga telah mengenal pasti faktor-faktor penting lain yang mempengaruhi penerimaan teknologi. Faktor ini ialah Penglibatan Pengguna dalam Pembangunan Sistem serta Latihan ICT dan Kemahiran. Kajian ini juga mengembangkan model ini dengan dua faktor tersebut dan diuji untuk menjadi pengantara serta kesan tidak langsung dalam model hubungan menggunakan latihan ICT. Latihan ini menjadi faktor kritikal dalam kejayaan teknologi maklumat, terutamanya di negara-negara membangun seperti Nigeria berdasarkan kajian lepas. Model yang dicadangkan terdiri daripada sebelas hubungan struktur hipotesis (langsung dan tidak langsung). Sebanyak 500 soal selidik telah diedarkan untuk kajian ini dalam kalangan dua kategori utama responden, iaitu kakitangan pengurusan dan kakitangan operasi. Kajian ini menggunakan kaedah analisis Partial Least Structural Equation Modelling untuk mengkaji hubungan sebab dan akibat, hubungan pengantara dan sederhana antara pemboleh ubah tersembunyi. Hasil kajian menunjukkan bahawa semua faktor penentu mempengaruhi secara positif berjaya menerima teknologi mengundi secara elektronik. Berdasarkan keputusan yang diperolehi, model penerimaan teknologi maklumat yang dikenali sebagai E-Voting Adoption telah dicadangkan. Implikasi teori dan praktikal akhirnya dibincangkan, manakala cadangan untuk penyelidikan pada masa akan datang turut disyorkan.

Kata kunci: Penerimaan E-voting, Penggunaan teknologi maklumat, Konteks organisasi, Pemodelan persamaan struktur

Abstract

The trend in the technological development has made the use of information technology and supporting devices mandatory in virtually all aspects of life. Yet the development of an Information system can be rejected by users due to several factors, that can be costly if left unsolved. This study investigates the determinant factors that can influence the successful adoption of electronic voting technology in the organisational context using the managerial and operational staff of the electoral commission for the data collection thorough a survey study. Based on previous studies on adoption of technology, four key determinants factors or variables i.e. Technological Readiness, Organisational Readiness, Environmental Factors, and Perceived Benefits were identified from theories of Diffusion of Innovations, Technology-Organisation-Environment framework, and Iacovou et al. (1995) model to develop a model of organisational adoption of electronic voting technology. Past studies in the area of technology adoption have equally identified other important factors that can influence adoption of technology such as user participation in system development and ICT training and Skills. The study extend the model with these two factors and tested for mediation and indirect effects in the model relationships using ICT training and Skills being a critical factors in the success of any information technology adoption, especially in the developing countries such as Nigeria as shown from previous studies. The proposed model consists of eleven hypothesized structural relationships-direct and indirect. A total of 500 questionnaires was distributed for this study between the two major categories, i.e. Managerial and operational staff. A Partial Least Structural Equation Modelling method of analysis was use to investigate the causal, mediating and moderating relationships between the latent variables. The results showed that all the determinants factors positively influence the electronic voting technology adoption success. Based on the results obtained, a model of information technology adoption known as E-voting adoption is proposed. The theoretical and practical implications were finally discussed, while necessary suggestions on future research were recommended.

Keywords: E-voting adoption, Information technology adoption, Organisational context, Structural equation modelling.

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Table of Contents

Permission to Use	i
Abstrak.....	ii
Abstract.....	iii
Acknowledgement	iv
Table of Contents.....	vi
List of Figures.....	xiii
List of Appendices	xiv
Glossary of Terms.....	xv
List of Abbreviations	xvi
CHAPTER ONE: INTRODUCTION	1
1.1 Background of the study	1
1.2 Motivation of Study	4
1.3 Problem Statement	5
1.4 Research Questions	8
1.5 Research Objectives	9
1.6 Theoretical Framework	10
1.7 Scope of the Research	12
1.8 Research Contributions	13
1.9 Organisation of the Thesis	16
CHAPTER TWO: LITERATURE REVIEW.....	18
2.1 Introduction.....	18
2.2 Electronic Government (E- Government) and Services.....	18
2.2.1 Electronic Democracy (E-democracy).....	21
2.2.2 Electronic-Voting (E-voting)	23
2.3 Topology and Functions of E-voting Technologies.....	24
2.3.1 Topology of E-voting Technologies	24
2.3.2 Features and Functionalities of E-voting Technology	28
2.4 E-Government and E-Democracy: The Nigerian Perspectives.....	31
2.5 E-voting Technology Adoption in Nigeria: The Needs, Challenges and Issues..	31
2.6 Overview of Countries with Adoption and Implementation E-voting.....	34
2.6.1 Introduction.....	34
2.6.2 India	35

2.6.3 Brazil.....	37
2.6.4 USA.....	38
2.6.5 Estonia.....	39
2.7 Models of Information Technology Adoption	40
2.7.1 Diffusion of Innovations (DOI)	42
2.7.2 Technology, Organisation, and Environment (TOE) Framework	43
2.7.3 Iacovou et al. (1995) Model.....	45
2.7.4 Limitation of the Adoption Theories	47
2.7.5 Integrating Innovation Adoption Theories and Frameworks.....	48
2.8 The Research Model	50
2.8.1 Research Constructs and Hypotheses Formulation.....	51
2.8.1.1 Technological Readiness (TR)	52
2.8.1.2 Organisational Readiness (OR)	53
2.8.1.3 Environmental Factors (EF)	54
2.8.1.4 Perceived Benefits (PB)	55
2.8.1.5 Inclusion of ICT Training and Skills and Users Participation in System Development.....	56
2.8.1.5.1 Users Participation in System Development (UPSD)	56
2.8.1.5.2 ICT Training and Skills (ICTSKILL).....	58
2.8.1.6 Hypotheses for Mediating Variable.....	59
2.8.1.7 Hypothesis for Multi-Group Variables.....	61
2.8.1.8 E-voting adoption (EAD)	62
2.9 Categorization of Research variables.....	64
2.10 Chapter Summary.....	65
CHAPTER THREE: RESEARCH METHODOLOGY	66
3.1 Introduction	66
3.2 Research Approach	66
3.2.1 Quantitative Approach	68
3.2.2 Justification for Quantitative Approach.....	68
3.3 Research Methods	69
3.4 Research Design.....	70
3.5 Sampling Design and Sample Size	73

3.5.1 Population of the Study.....	73
3.5.2 Sampling Design.....	73
3.5.3 Sample Size.....	75
3.6 Data Collection Methods	78
3.6.1 Survey Administration	78
3.6.2 Instrument Design	79
3.7 Unit of Analysis	88
3.8 Data Analysis	88
3.9 Reliability and Validity of Instruments Used for the Pilot Study	89
3.10 The Pilot Study: Instrument Development and validation Process.....	92
3.10.1 Method Used.....	93
3.10.2 Results and Discussion	93
3.10.2.1 Profile of Respondents (Pilot Study).....	94
3.10.2.2 Reliability of Research Constructs	96
3.11 Conclusion	101
3.12 Chapter Summary.....	102
CHAPTER FOUR: DATA ANALYSIS AND RESULTS	103
4.1 Introduction.....	103
4.2 Analysis of Survey Response.....	103
4.2.1 Response Rate of Distribution	103
4.2.2 Non-Response Bias Test.....	104
4.3 Profile of Respondents	106
4.3.1 Respondents Profile by Department	107
4.3.2 Respondents Profile by Position at INEC	108
4.3.3 Respondents Profile by Work Experience	109
4.3.4 Respondents Profile by Qualification	110
4.3.5 Respondents Profile by Gender	110
4.3.6 Descriptive Statistics of the Research Constructs (Variables).....	111
4.3.7 Respondents Profile by Age.....	112
4.3.8 Respondents Profile by Marital Status.....	112
4.4 Data Screening	113
4.4.1 Missing Data	113

4.4.2 Test of Normality	115
4.4.3 Linearity Test	118
4.4.4 Detection and Management of Outliers	120
4.4.5 Assessment of Multicollinearity	125
4.5 Measurement Model Assessment (PLS-SEM).....	128
4.5.1 Overview	128
4.5.2 Reliability and Validity Assessment	129
4.5.2.1 Reflective Measurement Assessment	129
4.5.2.2 Formative Measurement Assessment	133
4.5.3 Reliability and Validity Assessment Results	136
4.6 Structural Model Assessment (PLS-SEM)	137
4.6.1 Overview	137
4.6.1.1 Assessing the Structural Model for Collinearity	138
4.6.1.2 The Relevance and Significance of the Path Coefficients.....	138
4.6.1.3 Coefficient of Determination (R^2)	140
4.6.1.4 Effect Size (f^2)	141
4.6.1.5 Predictive Relevance (Q^2)	142
4.6.2 Structural Model Assessment Results.....	143
4.6.3 Results of Hypothesis Testing	151
4.6.4 Analysis of Mediating and Indirect Effect.....	154
4.6.4.1 Overview of Methods	154
4.6.4.2 Results of Mediation Analysis (Baron and Kenny Approach)....	156
4.6.4.3 Results of Indirect Effect Analysis	157
4.6.5 Multi-Group Analysis (MGA)- Heterogeneous Data Modelling.....	160
4.6.5.1 Observed Multi-Group Analysis (MGA)	161
4.6.5.2 Unobserved Multi-Group Analysis	164
4.6.5.3 Results of Multi-Group Analysis (MGA).....	168
4.6.5.3.1 Results of Observed Multi-Group Analysis	
(Nonparametric Approach).....	168
4.6.5.3.2 Results of Unobserved Multi-Group Analysis	
(FIMIX-PLS)	174

4.7 Chapter Summary.....	180
CHAPTER FIVE: DISCUSSION.....	182
5.1 Introduction.....	182
5.2 Research Overview.....	182
5.3 Discussion on the Research Hypotheses.....	184
5.3.1 The Influence of Technological Readiness on E-voting Adoption.....	184
5.3.2 The Influence of Organisational Readiness on E-voting Adoption Success.....	186
5.3.3 The Influence of Environmental Factors on E-voting Adoption Success.....	189
5.3.4 The Influence of Perceived Benefits on E-voting Adoption Success.....	191
5.3.5 The Influence of User Participation in System Development on E-voting.....	194
5.3.6 The Influence of ICT Training and Skills on E-voting Adoption Success.....	196
5.4 Discussion on the Mediating Effect Analysis.....	198
5.5 Discussion on the Multi-group Analysis.....	200
5.6 Chapter Summary.....	205
CHAPTER SIX: CONCLUSION AND FUTURE RESEARCH.....	206
6.1 Introduction.....	206
6.2 Discussion.....	206
6.2.1 Outcome of Hypotheses Testing.....	208
6.2.2 Research Questions.....	210
6.3 Research Objectives.....	221
6.4 Theoretical Contributions of the Research.....	224
6.5 Practical Contributions of the Research.....	227
6.6 Delimitations of the Study.....	230
6.7 Future Research.....	234
REFERENCES.....	236

List of Tables

Table 1.1: Research Variables and Source	10
Table 2.2: Association of Independent Variables and Dependent Variables of Iacovou et al. Model	46
Table 2.3: Summary of the Research Hypotheses.	62
Table 2.4: Research Variables	64
Table 3.1: Questionnaire Distribution Pattern	77
Table 3.2: Number of Questionnaire Returned	77
Table 3.3: Varimax Rotation of Five-Factor Solution for Items Used in Pilot Study	90
Table 3.4: Working Experience of INEC Staff	94
Table 3.5: Qualification for INEC Staff	95
Table 3.6: Reliability Analysis for the Variables Construct	97
Table 3.7: Correlation between TR and EAD	99
Table 3.8: Correlation between PB and EAD	99
Table 3.9: Correlation between OR and EAD	100
Table 3.10: Correlation between EF and EAD	100
Table 3.11: Model Summary (Regression Analysis)	101
Table 4.1: Test of Non-Respondents Bias	106
Table 4.2: Respondent Distribution by Department (main study)	108
Table 4.3: Respondent Distribution by Position (main study)	109
Table 4.4: Respondent Distribution by Work Experience (main study)	109
Table 4.5: Respondent Distribution by Qualification	110
Table 4.6: Respondent Distribution by Gender (main study)	110
Table 4.7: Descriptive Statistics for al Research Constructs (Variables) of the Study	112

Table 4.8: Respondents by Age (main study)	112
Table 4.9: Respondent Distribution by Marital Status (main study)	112
Table 4.10: Values of Skewness and Kurtosis of measured variables.	116
Table 4.11: Kolmogorov- Smirnov test of normality for all measured variables	118
Table 4.12: Identification of Error Outliers Using Boxplots	121
Table 4.13: Identification of Error Outliers Using Percentiles Analysis	122
Table 4.14: Identification of Error Outliers Using Scatter Plots	123
Table 4.15: Identification of error potential outliers using Malahanobis Distance	124
Table 4.16: Cases with Cook's D above 0.0107	124
Table 4.17: Collinearity Test with EAD as Endogenous Construct	127
Table 4.18: Collinearity Test with ICTSKILL as Endogenous Construct	127
Table 4.19: Results of Significant Relationships	145
Table 4.20: Summary of Results -Path Coefficients, Effect Sizes- f^2 and Effect Size- q^2	149
Table 4.21: Index Values and Total Effects for the IPMA of EAD	150
Table 4.22: Results of Hypothesized Relationships	153
Table 4.23: Testing for Mediating Effect	157
Table 4.24: Results of Indirect Effects Relationships	160
Table 4.25: Parameter Estimates (Path Coefficients) For Groups Based on WorkExperience	172
Table 4.26: Parameter Estimates (Path Coefficients) For Groups Based on Position	173
Table 4.27: Model Selection	174
Table 4.28: Relative Segment Size for Different Numbers of Segments.	174
Table 4.29: Parameter Estimates(Path Coefficients) For Groups Based on Gender	179
Table 4.30: Parameter Estimates (Path Coefficients) For Groups Based on Gender	180
Table 5.1: Organisational Factors Influencing E-voting adoption	202
Table 6.1: Summary of Significant factors and the T-Values	213

List of Figures

Figure 2.1: Major steps in the voting process when using DREs	23
Figure 2.2: Direct Recording Electronic Voting System	25
Figure 2.3: Optical Mark Recognition	26
Figure 2.4: Diffusion of Innovation	43
Figure 2.5: Technology, Organisation, and Environment Framework	44
Figure 2.6: Iacovou, Benbasat, & Dexter, 1995 model..	47
Figure 2.7: The Initial Research Model	
Figure 2.8: Main Research Model for E-voting adoption (EVSAM)	51
Figure 2.9: The Hypothesized Research Model	63
Figure 3.1: Schematic diagram for the Research Design	72
Figure 3.2: Map of Nigeria Showing the Geo-Political Zones	78
Figure 3.3: Working Experience of INEC Staff	95
Figure 3.4: Qualification for INEC Senior Staff	96
Figure 3.5: Chart Showing the Reliability Analysis for the Variables Constructs	98
Figure 4.1: Structural Model Results	146
Figure 4.2: IPMA Results of EAD as Target Construct	150
Figure 4.3: Structural Model (standardized PLS path coefficients) with Group (Position) Parameter Estimates	169
Figure 4.4: Structural Model (standardized PLS path coefficients) with Group (Work Experience) Parameter Estimates	170
Figure 4.5: Structural Model (standardized PLS path coefficients) with Group (Position) Parameter Estimates	176
Figure 4.6: Structural Model (standardized PLS path coefficients) with Group (Gender) Parameter Estimates	177
Figure 5.1: The Revised Structural Model of E-voting Adoption	204

List of Appendices

Appendix A Request For Research Instruments Evaluation	270
Appendix B Research Instruments	273
Appendix C Request For Research Data Collections	284
Appendix D Statistical Analysis	289
Appendix E Measurement and Structural Models Analysis	334

Glossary of Terms

E-voting Technology refers to the use of computers and other related equipment for votes casting in an election with the aims of increasing voter's participation, reducing the costs of elections and improving the accuracy of the election results.

IT Adoption IT Adoption refers to the application of Information and Communication Technologies (ICT) tools including computer hardware, software, and networks required for connecting to the internet in order to provide operational, managerial, and decision making supports in an organisation or to the users.

IT Innovations is the use of information technology in a creative ways to make organisation or users more efficient in order to improve the relationships between technology initiatives and the business or information technology goals.

List of Abbreviations

ACE	Administration and Cost of Elections
AVE	Average Variance Extracted
CB-SEM	Covariance-Based Structural Equation Modelling
CD	Compact Disk
CR	Composite Reliability
DOI	Diffusion Of Innovations
DRE	Direct Recording Electronic
DV	Dependent Variable
EAD	Electronic Voting Adoption
EF	Environment Factors
FIMIX-PLS	Finite Mixture- Partial Least Squares
GWIS	Government Wide Information System
ICT	Information Communication Technology
ICTSKILL	ICT Training and Skills
INEC	Independent National Electoral Commission
IPMA	Important Performance Matrix Analysis
IS	Information Systems
IT	Information Technology
IV	Independent Variable
IVS	Internet Voting Systems
KMO	Kaiser Meyer-Okin
LV	Latent Variable
MGA	Multi Group Analysis
MOBS	Modified Open Ballot System
NNPIT	Nigerian National Policy for Information Technology
OBS	Open Ballot System
OMR	Optical Mark Recognition
OR	Organisational Readiness
OSBS	Open Secret Ballot System
OSVS	Optical Scan Voting System
PB	Perceived Benefits
PCA	Principal Component Analysis
PLS-SEM	Partial Least Squares Structural Equation Modelling
SBS	Secret Ballot System
SMART	Speed, Moral, Accountable/Accurate, Responsive and Transparent
SPSS	Statistical Package for Social Science
TOE	Technology Organisation Environment
TR	Technological Readiness
UPSD	User Participation in Systems Development
VIF	Variance Inflation Factor
VVPAT	Voter-Verified Paper Audit Trail

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Paper voting (non-electronic voting) technology, the oldest and most popular voting system used by democratic countries the world over, has not been able to establish the voter's intents and to accurately translate the intents into a final tally or count in a convenient way for voters due to the scale and complexity of election. This has brought about decline in the voters turnout and apathy towards elections in most democracies (Burmester & Magkos, 2003; Merighi & Ravaioli, 2009). This has equally led to vote manipulation, ballot stuffing, ballot snatching, and outright vote stealing, among others, in most developing democracies, especially on the African continent (Folorunsho, Ogunseye, Okesola & Olaniyan, 2010).

The adoption and implementation of E-voting technology into the conduct of elections in some developed democracies such as United States of America, India and Brazil has reduced voter's apathy, improved voters turnout during elections, and ensured, to a greater extent, the accuracy of vote count (Avgerou, Ganzaroli, Poulymenakou, & Reinhard, 2009). The adoption of E-voting technology by developing democratic countries is not only expected to prevent, but also eliminate problems of ballot stuffing, ballot snatching, votes and voters records manipulations, among others (Umonbong, 2006; AlJa'am, Alkhelaifi, Al-Khinji & Al-Sayrafi, 2009; ACE Electoral Knowledge Network, 2011).

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