

A Test of the Technology Acceptance Model in Electoral Activities: The Nigerian Experience

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ABSTRACT : *The paper examined Technology Acceptance Model (TAM) within the context of electoral process in Nigeria, with a view to determining the characteristics of users of technology in the country. Data for the study were obtained through the primary and secondary sources. Primary source include the use of questionnaire, interview of respondents and observation. The study revealed that age, education, training, experience and user involvement are the major demographic variables that can determine acceptance of technology as its relates to electoral process. User involvement, experience, training need for achievement and education were equally the most prominent determinants of acceptance of technology across all thesis geo-political zones. The study concluded that these determinants should be considered by the Independent National Electoral Commission in determining the choice of technology for voting in the nearest future.*

KEYWORDS – *Technology, Electoral Process, Technology Acceptance Model, Nigeria.*

I. INTRODUCTION

In designing a new technology, it is pertinent to consider what characteristics users of new technology should possess. Technology Acceptance Model attempted to examine the motivations and perceptions of people using such technology. The Independent National Electoral Commission had deployed series of technologies since independence and intends to deploy more as the commission approaches 2019 general elections. Technologies deployed since independent include but not limited to Direct Data Capture Machine, Smart Card Readers, electronic transmission of results from registration area and Local Government Areas.

Understanding the factors that determine user acceptance of information technology is of paramount importance both to researchers in a variety of fields as well as procurement of technology for large organizations. While Millions of naira have been spent on the deployment of technologies in Nigeria particularly in electoral process, for over a decade, it is doubtful whether the Independent National Electoral Commission, has ventured to determine the acceptability of these technologies.

Despite the massive deployment of these technologies in electoral process in the country, effort has not been empirically made to determine those sociological, demographic, psychological and technological characteristics of the users that could enhance the design and procurement of appropriate technology and consequently guarantee

acceptability. Hence this study. It should however be noted that deployment of technology in the electoral process is relatively new in Nigeria, hence literature review on the social acceptability of technologies in this context is sparse.

II. THEORETICAL FOUNDATION

There are various models of acceptance ranging from technology acceptance model to theory of the visioned action, diffusion on innovation, situational theory and so on. Within the context of this work, models that will assist in designing and implementing acceptable technology was used. Hence TAM could be appropriate here, since it emphasizes the experience of users of technology to conclude whether the technology is acceptable or not. Also Technology acceptance Model has been widely used to make accurate prediction of human choice in situation as diverse as voting in an election [1]. TAM proposes a direct path from perceived usefulness to intention, violating Theory of Reasoned Action (TRA) which shows attitude completely mediating the relationship between beliefs and intentions [2]. According to [3], in the work environment, intention to use IT may be loaded on its anticipated impact on job performance, regardless of the individual's overall attitude toward that system. Put differently, an employee may use the system if it is perceived to increase job performance. [4] Found a stronger relationship between perceived usefulness and intention to use than perceived ease of use and intention.

III. METHODOLOGY

Data for the study were obtained through the primary and secondary sources. Primary sources included the use of questionnaire, interview of respondents and observation. A multi-stage sampling procedure and purposive sampling were used for the study. States with the highest registrants in the voter registration in 2006 in the six geo political zones were purposively selected for the study. They include: South east –Anambra, North Central – Benue, North East – Bauchi, North West – Kano, South South – Rivers and South West – Lagos. From each states 0.05% of registrants in the local government with the highest registrable adults was sampled. The total sample size was 716. Finally the major stakeholders in electoral process were purposively selected for interview. This was to complement information from questionnaire. These stakeholders included Nigerian Bar Association, National Council for Women’s Societies (NCWS), The Academic Staff Union of Universities (ASUU), Nigerian Union of Teachers, Nigerian Labour Congress among others.

IV. ANALYSIS OF DATA

Data collected from the six geo political zones were analyzed using frequencies and percentage. The inferential statistics used included chi-square, Duncan Multiple Range Test (DMRT) and ANOVA. The ANOVA compared the significant level of variables in all the geo political zones. DMRT brings out relationship between and within the variable means across the zones. It also brought out the significant difference between and among means.

Table I: Determination of Acceptability of Technology for Electoral Activities in the Six Geo Political Zones

Location	Age	Education	Training	Experience	User involvement	Need for achievement	Degree of defensiveness	Locus of control	Risk taking propensity	Innovation	Early adopter	Late adopters	Laggards	Perceived usefulness	Perceived ease of use	Religion	
South/East																	
Anambra (N = 67)	Mean	4.03b	4.13b	4.43c	4.43d	4.27d	3.52bc	2.70a	3.28ab	2.99ab	3.78b	3.51b	2.97ab	2.69a	3.40ab	3.39ab	3.07c
North/West																	
Kano (N = 131)	Mean	3.62a	3.82ab	3.79a	3.49a	3.38a	3.42ab	2.99ab	3.04a	3.04ab	3.37a	3.41ab	2.92ab	2.66a	3.31a	3.46abc	2.98c
NorthEast-Bauchi																	
(N = 107)	Mean	3.87ab	3.54a	3.77a	3.59ab	3.38a	3.17a	2.68a	3.24ab	2.79a	3.35a	3.18a	2.76a	2.96ab	3.60abc	3.27a	2.05a
North Central																	
Gboko (N = 91)	Mean	3.66a	4.12b	3.97ab	3.86bc	3.76b	3.85c	2.86ab	3.30ab	3.15b	3.75b	3.46ab	3.04ab	3.08b	3.66c	3.56abc	2.43ab
South/south Port																	
Harcourt (N = 138)	Mean	3.88ab	3.83ab	3.93ab	3.79abc	3.90bc	3.64bc	3.07b	3.37b	3.22b	3.67b	3.52b	3.18b	3.07b	3.70c	3.66bc	2.90c
South West																	
Lagos (N = 182)	Mean	3.87ab	4.10b	4.24bc	4.01c	4.10cd	3.76bc	2.95ab	3.35ab	3.28b	3.80b	3.65b	3.04ab	2.85ab	3.79c	3.76c	2.46b
Total (N = 716)	Mean	3.81ab	3.92ab	4.01abc	3.83abcd	3.80abcd	3.57abc	2.91ab	3.27ab	3.11ab	3.62ab	3.47ab	3.00ab	2.89ab	3.60aabc	3.55abc	2.63abc

Source: Field Survey, November (2009)

- Key:**
- 1 = Not agreed
 - 2 = Slightly agreed
 - 3 = Moderately agreed
 - 4 = Agreed
 - 5 = Strongly agreed

Means with the same letters are not significantly different

TABLE II: DETERMINANTS OF SOCIAL ACCEPTABILITY OF TECHNOLOGIES

ANOVA		Sum of squares	Df	Mean Square	F	Sig.
Age	Between Groups	11.72	5	2.34	1.62	0.15
	Within Groups	1,025.221	710	1.44		
	Total	1,036.92	715			
Education	Between Groups	30.45	5	6.09	4.14	0.00
	Within Groups	1,045.17	710	1.47		
	Total	1,075.62	715			
Training	Between Groups	34.71	5	6.94	6.03	0.00
	Within Groups	817.20	710	1.15		
	Total	851.91	715			
Experience	Between Groups	52.10	5	10.42	8.43	0.00
	Within Groups	877.11	710	1.24		
	Total	929.21	715			
User involvement	Between Groups	74.58	5	14.92	12.55	0.00
	Within Groups	843.65	710	1.19		
	Total	918.23	715			
Need for achievement	Between Groups	34.39	5	6.88	4.90	0.00
	Within Groups	996.69	710	1.40		
	Total	1,031.08	715			
Degree of defensiveness	Between Groups	13.54	5	2.71	1.85	0.10
	Within Groups	1,037.19	710	1.46		
	Total	1,050.73	715			
Locus control	Between Groups	9.77	5	1.95	1.70	0.13
	Within Groups	816.74	710	1.15		
	Total	826.51	715			
Risk taking propensity	Between Groups	19.64	5	3.93	2.80	0.02
	Within Groups	995.86	710	1.40		
	Total	1,015.50	715			
Innovation	Between Groups	25.66	5	5.13	4.02	0.00
	Within Groups	907.25	710	1.28		
	Total	932.91	715			
Early adopter	Between Groups	19.19	5	3.24	2.74	0.02
	Within Groups	840.36	710	1.18		
	Total	856.55	715			
adopter	Between groups	12.35	5	2.47	1.76	0.12
	Within Groups	997.64	710	1.41		
	Total	1,009.99	715			
Laggards	Between Groups	18.06	5	3.61	2.23	0.05
	Within Groups	1,150.22	710	1.62		
	Total	1,168.28	715			
Perceive usefulness	Between Groups	21.81	5	4.36	3.14	0.01
	Within Groups	987.33	710	1.39		
	Total	1,009.14	715			
Perceive ease of use	Between Groups	21.16	5	4.23	3.16	0.01
	Within Groups	949.82	710	1.34		
	Total	970.98	715			
Religion	Between Groups	84.24	5	16.85	8.04	0.00
	Within Groups	1,488.42	710	2.10		
	Total	1,572.66	715			

V. DETERMINANTS OF ACCEPTANCE OF NEW TECHNOLOGY

[5] Suggest that it is important to consider user factors in determining technology acceptance in order to arrive at the choice, design and operation of a technology. He went further saying that while ability to use any technology is obviously necessary, it is not sufficient to ensure acceptability and many technologies that are demonstrably usable ones are never accepted by the target user. He further identified the most relevant user factors determining technology acceptance as cognitive style, personality, demographics and user situational variables.

In the same manner, [6] also identified education, location, age, income, gender, government assistance (political will), employment status, and race as socio cultural factors that can affect adoption of a new technology. He however suggested that age, education and location have the greater effect. It was in the light of the above that the study consider and adopted these factors as important in determining the acceptability of a new technology in the management of electoral process in Nigeria.

For the purpose of reporting this analysis, a mean above 3.5 was regarded as an important factor determining the social acceptability of technology. This is because 3.5 is close to the benchmark of 5 [7].

Tables I and II reveal analyses based on ANOVA and Duncan Multiple Range Test (DMRT). Age had the highest mean of (4.03) in Anambra, an indication that age is an important determining factor. Age was not significantly different in Bauchi, Portharcourt and Lagos ($F=1.62$, $P<0.1$). Also there is equality in the opinion of respondents in Kano and Benue (Gboko). The least weighted mean was found in North Central Gboko (3.66). Hence, it can be inferred that age is an important determinant of social acceptability across the six geopolitical Zones.

Also, level of Education was not significantly different in all the zones except Bauchi and Kano ($F = 4.14$, $P < 0.05$). Anambra had the highest mean of 4.13 in the six zones while Bauchi has the least mean of 3.54. Invariably, all

the means in the six zones point to the fact that education is an important factor.

For training, there was no significant difference between Kano and Bauchi and also between Benue (Gboko) and Rivers (Portharcourt) ($F = 6.03$, $P < 0.05$). The results also shows that the weighted means were more than 3.5 with the highest in Anambra (4.43) and the least in Bauchi (3.77). This indicates that training is a very important factor. However, there is significant difference in the view of respondents on experience as a determinant across the six geopolitical zones ($F=8.43$, $P<0.05$). The highest weighted mean for experienced in Anambra was (4.43) while the least was 3.49 from Kano. With the exception of Kano, it can be inferred that experience is an important determinant of social responsibility of technology in the zones.

Furthermore, there exist no significant difference between Kano and Bauchi in terms of users involvement ($F = 12.55$, $P < 0.05$). Anambra had the highest mean of 4.27 while Kano and Bauchi had the least weighted mean of 3.38. However, user involvement is an important factor determining social acceptability because the weighted means in all the zones are above 3.5 except in Kano and Bauchi where the means were 3.38.

Under personality traits, the need for achievement is not significantly different in Anambra, Portharcourt and Lagos ($F = 4.90$, $P<0.05$). This factor was important in all the zones except Kano and Bauchi where the means are less than 3.5. Other personality traits such as degree of defensiveness, locus of control and risk taking propensity are not so important factors because their means are less than 3.5.

Innovation appears to be the most significant determinant among user situational variables. It shows that there exists no significant difference in Benue (Gboko), Rivers (Portharcourt), Lagos and Anambra at $F=5.13$, $P<0.05$. There also exist no significant difference between Kano and Bauchi. A critical look at Table I shows that other variables such as locus of control (the place where an individual feels the control to accept innovation) is seem to be less important determinants because its means across the zones

are mostly below 3, an indication that the respondents did not see them as good determinants.

In Table II, user involvement ($F= 12.55, P < 0.05$); experience, ($F = 8.43, P < 0.05$); training, ($F = 6.03, P < 0.05$); need for achievement, ($F = 4.90, P < 0.05$); education, ($F= 4.14, P < 0.05$); and innovation, ($F = 4.02, P < 0.05$) and age ($F = 1.62, P < 0.05$) were not significantly different in most of the geopolitical zones with the means above 3.5. Hence, they are the most important determinants of social acceptability of technology. Also, perceived usefulness is not significantly different in Gboko and Portharcourt ($F = 3.14, P < 0.1$). This confirms the work of Rogers (1995) that education, training, experience and user involvement correlate well with the acceptance of new technology. Looking at some of the variables considered to be important in the acceptability of new technology, age, education and training are some of the variables that the commission should consider most in the acquisition and deployment of new technologies in the future. For example, youth plays a very important role in politics in Nigeria. They form about more than 50% of the Population in Nigeria - National Population Commission. Hence the design of the technology should consider the interest of the youth. Similarly, education and training cannot be left out. There are many illiterates in the country and probably they may form the bulk of the users of this technology. The technology therefore needs to be user-friendly to accommodate the illiteracy level in the country. Similarly, emphasis should be placed on training of users and operators of the equipment. Other factors include perceived usefulness which is the degree to which a user believes that using the system will enhance his or her performance. Perceived ease of use on the other hand means the degree to which the user believe that using a system will pose no problem or will be free from effort. All these should be considered before designing and choosing a new technology for voting in the country.

VI. CONCLUSION

The study concludes that demographic variables as well as situational trait such as age, education, training, perceived usefulness, perceived ease of use are important factors to be considered in the choice of appropriate technology for the commission.

VII. RECOMMENDATION

1. The Independent National Electoral Commission, should take into consideration the result of this research by paying attention to the identified demographic, personality traits as well as situational variables which are paramount in the determination of social acceptability of new technology. This becomes relevant because of the urge by the Commission to move towards electronic voting in Nigeria.
2. Raising the literacy level as well as emphasizing training are very important before acquiring new technology. Illiteracy level in Nigeria is presently put at about 36.1% of the population UNESCO. Specifically, about 65 million Nigerians are illiterates. Hence, the technology should not be too complex for people to operate.

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AUTHOR'S PROFILE



Dr. (Barr.) Omoleke Muslim was born in Ikire, Irewole Local Government area of Osun State, Nigeria. He attended Ife City College between 1976 and 1980

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