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IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGIESON THE PERFORMANCE OF NIGERIAN PRINT MEDIA OPERATIONS

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Abstract

The study aimed to determine the impact of ICTs on the performance of Nigerian newspapers and magazines in carrying out their functions. The study employed the survey research method using questionnaire and interview, and Binary Logistic Regression was used to test the hypothesis. It was revealed that the use of ICT forms has significant impact on the performance of journalists in the Nigerian print media.The dominant ICT forms in use by print journalists undeniably impact on the operations of the print media in the areas of in-depth and speedy coverage of events, improved picture quality, wider readership and circulation as well as more advertising revenue.

Keywords: ICT, Media, Nigeria, Operations, Performance, Print

1. Introduction

Information and Communication Technologies (ICTs) have dominated every aspect of human existence (Erkan & Evans, 2016; Ehikioya & Guillemot, 2020; Omigbodun, Familusi et al., 2026). In mass media operations, this dominance assumes greater measure because of the exigency of providing timely and functional information that facilitates societal integration and transaction.

The World Wide Web (www) or the Internet has greatly altered the landscape of information gathering and dissemination(Hsu, 2018; Kaiser et al., 2019). Today, the future of the journalist is tied to ICTs such that the journalist of the future must be computer literate and multi-tasking (Akinloye, 2024a). Thus, his resourcefulness and usefulness will depend on his competence and efficiency in the utilization of the computer in the processing of data for the information superhighway (Akinloye, 2024b). Consequently, the new age journalist must have demonstrable skills in the application of ICTs for enhanced productivity.

The knowledge of the computer in the application of information and communication technologies by the print media journalist in Nigeria is not negotiable in print media

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operations. Schmid (1998) argued that, the "new medium" – the computer is fast changing the classical notion of the press or print media. Schmid (1998) identified some advantages such as democratic access, low costs, updated contents, approach to the contents and disposal of contents that the Nigerian print journalist who is not computer literate is not likely to benefit. He summed up that, one major aspect of the new media is its processing capacity, providing us with living information (Akinloye, 2025).

Going by their products and methods of production, the Nigerian print media in particular, would be assumed to be conversant with the twenty-first century communication technologies. However, the actions and inactions of print media journalists have cast doubt on their competence and ability to adequately apply ICTs in print media operations (Adeniran, Olorunfemi & Akanmu, 2025). The inability of the Nigerian journalist to function effectively in the sciences, business and economic reporting, which are in vogue, underscores the reality that, Nigerian journalists are yet to adequately embrace Information and Communication Technologies. Emerging ICT packages such as e-business, e-enterprise, e-commerce, e-trading, e-banking and money transfers have variously challenged Nigerian print journalists in their operations (Akinloye, 2024b; Omigbodun, Familusi et al., 2026).

Of greater concern is the absence of a clear - cut ICT policy and implementation framework for the mass media. The 2001 Nigeria National Policy for IT did not provide any specific policy for the mass media. This omission underscores the low level of education and illiteracy in ICTs among government officials and the population at large. The result is the obvious lack of enabling environment for technological advancement that could make the Nigerian print media contribute to national development (Adeniran, Olorunfemi & Akanmu, 2025).

Indeed, there are numerous experiences relating to the value of ICTs in communication for development in Nigeria. What has not been fully understood is the current uses and impact of ICTs on the operations of newspapers and magazines. To this end, the research problem addresses the question of what impact ICTs exert on newsgathering, processing and dissemination, content and production of newspapers and magazines given the apparently low adoption level of these technologies by organizations concerned.

The aim of this study is to determine the impact of ICTs on the performance of Nigerian newspapers and magazines in carrying out their functions. The hypothesis states that there is no significant impact of ICT on the performance of Nigeria print media.

2. Literature Review

Impact of ICT on Print Media Industry in Nigeria

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The impact of ICTs on human existence is interesting (Choshin & Ghaffari, 2017; Cheng et al., 2019; Gogoi, 2021), particularly on newspaper and magazine production in Nigeria. The computer in particular has greatly facilitated desktop publishing, printing and distribution of newspapers and magazines. Similarly, the Internet has enhanced the efficiency of the Nigerian print journalists through sourcing of information to enrich their production. It has also, promoted the use of Digital Cameras for production of high-quality photograph required for newspaper and magazine production. The industry and the consumers of its products are the beneficiaries of it all. Through modern ICTs, newspapers and magazines are now able to publish in colour, print from different locations at the same time, while newsgathering and processing, have been simplified through technology-driven gadgets.

The improvement in the use of ICTs has enabled newspapers such as Thisday, The Sun, The Nation and Daily Trust print in more than one location simultaneously. Thisday prints in Abuja and Lagos, The Sun prints in Lagos and Onitsha, The Nation in Lagos and Abuja, Daily Trust prints in Abuja, Kano and Maiduguri all at the same time. This has led to increased advertising and sales, revenue and wider circulation.

On their part, newspapers and magazines now compete head-to-head with the electronic media in terms of technology aided production process and services – news, education, entertainment and advertising. Modern newspaper and magazine production and distribution processes now adopt multiple inputs – human, money and new media (ICTs) to drive their operations. Indeed, ICTs have greatly altered the traditional landscape of the print media. However, whether these developments occur or not, it is clear that newspaper and magazines now operate in a more complex environment prior to the advent of digital technology.

From the foregoing, the inevitable thesis is that, information and communication technologies are now the key driving force in print media operations. This implies that, social progress in society which is the main obligation of the print media is driven by technological innovations. However, for social change to occur among print media audience members, new technologies must be applied in a mutually congruent disposition with other inputs.

Table 1: Examples of Print Media Uses of ICTs

S/N	Description of ICT use by selected Newspapers/Magazines	Source	Date
1.	Readers to send comments/experiences to writer of article on “How to change a Flat Tyre” through Email to: Aminaaa@leadershipeditors	Leadership Weekend	December 4,2010
2.	Clients to forward adverts for placement on Leadership Newspaper through email	Leadership	December

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	to: adverts@leadershipeditors.	Weekend	4, 2010
3.	Online Reactions: what people are saying to www.dailytrust.com Subject: "SSS Officer, Wife, 3 kids slaughtered in Kano"	Daily Trust	September 15, 2010
4.	Text us on 08131800030 Subjects: "The 2011 illusion" "going too fast" "Suicide" etc	Daily Trust	November 3, 2010
5.	Comments (views from Abroad) through www,ining.com Subject: "Freedom shouldn't mean doing exactly what you want"	Daily Independent	December 15,2010
6.	Letters to the Editor @ining.com, Letters inng @yahoo.com	Daily Independent	December 15, 2010
7.	Free Kick: your voice can be heard. Email: Freekick@unnewsonline.com	Daily Sun	December 15, 2010
8.	View Point: Owei Lakemfa Text 08033572121 Email: Lakemfaowei@ahoo.com	Vanguard	December 15, 2010
9.	"Women and Family by Ruth Benard" Readers to send email to augustaruth@yahoo.com.uk DAN AGBESE	New Nigeria Newspaper	December 15, 2010
10.	Reactions Column: FACTS, not Maths. SMS: 08055001912	Newswatch	December 20, 2010
11.	The Audacity of a Chicken: demotunde@tellng.com SMS: 08076290484	Tell	No. 50, December 20, 2010
12.	Feedback: Re: World's most wasteful Democracy Email: mails@thebewsbg.com	The News	December 20, 2010

Theoretical Framework and Related Theories

This study is hinged on Critical Mass Theory and Social Network and Social Support Theory.

Critical Mass Theory

The concept of critical mass theory as it applies to the adoption of communication technologies is imperative in the understanding of the thematic preoccupation of this study. The term is derived from physics where critical mass refers to the minimum

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amount of material needed to trigger, and sustain a radioactive chain reaction. Kaye and Medoff (2001) stated that the term has been loosely applied to communication and refers to the number of people needed as adopters before a new technology can have a permanent place in the society, Williams, Strova and Grant (1994) corroborated thus:An interesting aspect of the critical mass perspective is that widespread use appears to have a snow ball effect. Once a perceived critical mass is using the technology, those without it are strongly motivated to adopt it. The reasoning here is that, despite the drawbacks such as cost or difficulty in using the technology(Cabosky, 2016; Giao, 2018), people (and institutions) are pressured to adopt the technology because failure to do also may exclude them from existing communication networks.

The implication here is that, before any technology can be said to have significant impact on individuals, corporate bodies and the society at large, a critical mass of adopters must necessarily emerge. Communication scholars such as Markus, (1990) and Neufeld, (1997) cited in Kaye and Medoff (2001) provided a general but tentative requirement when they said that, a critical mass is achieved when at least 16 percent of the entire population has adopted an innovation.

One strong criticism against the theory is that, the 16 percent milestone appears unreliable especially that its postulants failed to provide impact assessment framework for increasing the percentage of adoption(Bueno & Gallego, 2021). However, the strength of this theory in relations to this study is the fact that, despite the percentage of the critical mass (Adopters), those who have not adopted the innovation are motivated to adopt it. This theory therefore, goes further to provide the basis for evaluation of the current uses and impact of these new media (ICTs) on the Nigerian print media.

In all, the critical mass theory justifies the theoretical basis of this study and it provides the bearing for the use of ICTs by print media journalists in their tasks of information gathering, processing and dissemination. However, this is not to depreciate the enormous challenges being faced by Nigerian journalists in their quest to cope with the digital society.

Social Network and Social Support Theory

The social network and social support theory was propounded by Israel Stein in 1985 to explain the mechanism by which social interactions can promote or inhibit individual or collective behaviour. The theory according to Manon Court (2002), emphasise the importance of “social network” and “social support” in all forms of human relationships. The scholars opined that, social network and social support refer to the linkages and social relations between people, nations and organisations, and the content of the relationship, that is, what is actually being shared or transmitted during different interactions.

The theory recognises three types of supportive actions which include:

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[1]. Emotional Support: It refers to the emotional support derived from social networks and social interactions aimed at enhancing the relationship among parties concerned. This could come in form of show of concern, care, esteem, love, sympathy, and affection among others.

[2]. Instrumental support: This includes technological transfer, skills and capacity building support, money, tangible aids; and transportation among others.

[3]. Informational support: This includes advice, suggestions, counselling or rendering and dissemination of information useful to problem solving.

Manoncourt (2002) and Edim, Gbadegesin, et al.(2025) further explained that, these factors are capable of influencing, promoting or inhibiting the growth and development of meaningful or purposeful relationships.

In the past few years, the social network and social support theory has evoked enormous interest occasioned by the pervasive emergence of modern information and communication technologies. Ethier (2004) stated that, the rapid interest in the theory is a result of the impact of ICTs on all forms of human relationships or interactions. Abu-Salim, Mustafa et al. (2019) basically established that “each actor of a group coming to a certain consensus depends on the group’s contribution of opinions which can be facilitated or hindered by communication barriers, noting that ICTs have removed almost totally, such barriers(Duan & Dholakia, 2017; Edim, Gbadegesin, et al., 2025).

The basic premise of the theory according to Ethier (2004) hinges on the fact that, the “promotion or inhibition of social interactions that could lead to emotional, instrumental and informational support is based on information obtained from the analysis of social network of the concerned parties”. This presupposes that opinion formation and supportive action is based on “Social network” which are necessarily formed and updated overtime with the help of different sources of information (Adeniran, Olorunfemi & Akanmu, 2025).

In their contributions, Arabia and Wind (1999) opined that, the growth, development and acceptance of the social network and social support theory is fostered by the emerging role of ICTs in human relations. According to them, “the field of social network and social support theory has opened the door for new research in social relations methodologies”. They contended that “by understanding the mappings connecting one individual to others, one can evaluate the resources that individual which can be used to influence others in the social circuit (Alarifi, Alsaleh & Alomar, 2017).

The theory is variously criticized for its failure to provide instruments for measuring upward and downward supportive action since human action arousing from social network cannot be wholly predictable in all circumstances.However, the theory is relevant to this study especially its emphasis on ICTs as mechanism by which social interactions can be enhanced to promote individual and collective behaviour as well as the subject for supportive action (Asadi & Hemadi, 2018).

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The prescription of the theory that opinion formation and supportive action are based on "social network" means that, the theory provides a sound bases for analysing how social networks in newspaper and magazine organisations can facilitate or mar the adoption of ICTs by journalists in the performance of their duties.

3. Methodology / Materials and Methods

Research Design

The study employed the survey research method using questionnaire and interview to determine the extent to which information and communication technologies impact on the print media in Nigeria. Barbie (1998) gives credence to the value of this research method. Survey research is probably the best method available to the social scientist interested in collecting original data for the purpose of describing a population too large to observe respondents whose characteristics may be taken as representative of those of larger population opportunity to be selected. Survey is also an orientation prevalent within a large population(Barbie, 1998; Adetayo, Njoku & Stephens, 2023; Asifat, Familusi & Folorunso, 2024).

The choice of survey is indeed informed by its relevance in this as it attempts to determine the incidence, distribution and interaction among sociological and psychological variables. This is more so that, only a representative sample of the population will be studied in this work and findings generalised. Again, Osuala (1990) states that "...survey synthesises and interprets useful data for sound conclusion".

The researcher is however, aware and conscious of the major weaknesses of straight survey research method using a structured questionnaire. Chava and David (1996) identified the following four of such major weaknesses associated with survey using only questionnaire:

[1]. Requires simple questions which are straight forward enough to be comprehended solely on the basis of the printed instructions and definitions;

[2]. The researcher has no opportunity for probing beyond the given answers. The answers have to be accepted as final;

[3]. No control over who fills out the questionnaire as the researcher has no control over the respondent's environment hence he cannot be sure that the appropriate person completes the questionnaire; and

[4]. The difficultly of obtaining an adequate response rate which is the percentage of respondents in the sample who retire completed copies of the questionnaire.

Based on the foregoing, the researcher enriched the survey research with oral interview which is another primary data gathering tool.

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Population of the study

The population which this study targets comprises practising journalists in the headquarters of the entire print media establishments in Nigeria national newspapers and magazines) and the entire management staff of two (2) relevant bodies responsible for formulating policies and regulating current uses of ICTs in Nigeria viz: Federal Ministry of Science and Technology as well as the National Information Technology Development Agency (NITDA), Abuja.

A breakdown of this population shows that the practising journalists in the headquarters of 13 national newspapers are 435, those in the headquarters of three (3) national magazines are 81, those practising journalists in the headquarters of seven (7) local newspapers across the (6) geopolitical zones of the country are 180 while the entire management staff of Ministry and Science and Technology and National Information Technology Development Agency (NITDA), Abuja are 15. Therefore, 435+81+180+15 = 711.

Thus, it is 711 that constitute the population of this study. (See Appendix A and Bfor population of national and local newspapers and magazines in Nigeria as well as for population of interviewees).

Sample Size

A sample size of 323 was chosen for this study. This was statistically determined using systematic sampling with a random start. Gbolagunte and Popoola (2003:42) have provided the following steps which should be observed when determining sample size using systematic sampling with a random start.

1. The population of the study must be known;
2. The researcher must decide on the fraction of the population that will constitute the sample;
3. The next stage is for the researcher to multiply the population by the fraction he has decided on in the second stage. The product of the multiplication will be the sample size (denoted by letter *n*).

The population of this study is 711. This is the first step in determining the sample size for this study. The second step is deciding on the fraction of the population which will constitute the sample. For the purpose of this study, the fraction of the population was $\frac{1}{2}$. This was justifiable because the researcher understood that $\frac{1}{2}$ of the population would be quite representative of the entire population of the study. The next step was to get the sample size. This involved the multiplication of the population (711) by the fraction $\frac{1}{2}$. Thus $\frac{1}{2} \times \frac{711}{1} = \frac{711}{2}$ =355.

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The sample size for this study was therefore statistically determined to be 355 (n = 355). This sample size is considered an adequate representation of our study population because as Nwana (1991) explained, for a population of 6,816 persons, a sample size of 340 would be quite appropriate or representative of the population. This effort also finds support in the widely accepted statistical rule that for a population of 1,000 to 2,000, a sample size of 100 would be appropriate (Nwosu and Uffoh, 2005).

Sample Selection Techniques and Procedure Questionnaire

The select the sample for the questionnaire, the simple purposive and simple random sampling techniques were used. Through the purposive sampling technique, the research selected six (6) national newspapers, three (3) national magazines and seven (7) local/state newspapers across the six geopolitical zones and FCT Abuja.

The justification for purposively selecting the national newspapers and magazines was because of their national spread, wide readership and effectiveness as well as their disposition to ICTs as organisational resources, the local newspapers were selected for want of national papers in the affected geopolitical zones of the country,

Through the simple random selection techniques, the researcher selected 25 journalists in the headquarters of each of the six (6) national newspapers, 20 from each of the three (3) national magazines and 15 from each of the seven (7) local papers.To accomplish this technique, the researcher wrote numbers of respondents in each organisation on pieces of paper, folded then, put then in cans and shuffled. A research assistant was, therefore, asked to pick from each can a folded piece of paper. The result of this exercise showed that 25 journalists would be sampled from the headquarters of each of the six (6) national newspapers, 20 would be sampled from each of the three (3) national newspapers and 15 from each of the seven (7) local papers.

To give each respondent a chance of being selected, the researcher requested and obtained the staff list of newspapers and magazines organisations. With this in hand, the researcher wrote the names of individual staff in each organisation on pieces of paper, folded, put the pieces of paper in cans and shuffled them. For each can belonging to an organisation, a research assistant was asked to pick according to the number which was earlier picked for each organisation.

Following this procedure 150 respondents were selected from six (6) national newspapers, 60 from the three national magazines and 105 from the seven (7) local newspapers. This brought the number of respondents from the questionnaire to 315.

Interview

To select sample for the oral interview, the purposive sampling technique was adopted. This led the researcher to selecting one (1) chief executive and three (3) management staff from each of the two (2) sampled ICTs regulatory agencies viz:

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Ministry of Science and Technology, Abuja and NITDA, Abuja. The decision to purposively select these categories of persons was informed by the fact that these people were directly concerned with ICTs policy formulation, implementation and regulation. Given these roles, the chosen respondents were bound to be more knowledgeable about ICTs than the rest of the people in these organisations. The departments from where the respondents were purposively selected are:

Federal Ministry of Science and Technology

1. Director of Administration and Finance (DAF) on the instruction of the Honourable Minister – interviewee
2. Planning, Research and Policy Analysis, Department – 1 interviewee
3. Information and Communication Technology Department – 1 interviewee
4. Technical Acquisition and Assessment Department – 1 interviewee

National Information Technology Development Agency (NITDA)

1. Director General – 1 interviewee
2. Infrastructure and Capacity Development Department – 1 interviewee
3. Strategic Planning and Research Department – 1 interviewee
4. Standards and Regulation Department – 1 interviewee

Following this procedure, 8 respondents were selected for the oral interview. This brought the total number of respondents for both questionnaires and oral interview to 323.

Research Instruments and Administration

The instruments used to elicit information from the respondents were questionnaire and interview guide.

Questionnaire

The questionnaire was divided into four (4) sections. Sections A, B, C and D. Section A which was principally concerned with the bio data of the respondents, had six items ranging from the age to the place of employment of respondents. Section B contained 18 items which were to be attended to by every respondent to the questionnaire. These sought to know from the respondents, among other things, their usage of ICTs, factors influencing the procurement of ICTs in the respondent's work as well as the types of ICTs which the respondents use. Section C was also designed for all the respondents and was principally concerned with knowing from the respondents the most prevalent factors constraining ICTs application the respondent's organisation. Section D contained 11 items which sought to know from the respondents the various advantages of the uses of ICTs in the respondent's organisation.

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For ease of administration of the research instruments, eight (8) pre-trained research assistants were engaged in the administration of research instruments to sampled respondents is the six (6) national newspapers, three (3) national magazines and seven (7) local newspapers under study. The selected research assistants acted for, and on the strict directives of the researcher. The qualification of these research assistants is first degree in Mass Communication (B.A and B.Sc.). Permission for necessary use of staff of these establishments was obtained from the various Chief Executive Officers (CEOs).

The research assistants administered the questionnaire to sampled respondents as follows:

a. North Central and North East - 2 research assistants
b. North West - 2 research assistants
c. South East and South South - 2 research assistants
d. South West - 2 research assistants

As much as the questionnaire administration and retrieval were done at the different sampled locations concurrently, the exercise took eight (8) working days after which the instrument was subjected to interpretation and analysis.

Interview Guide

Appreciating the significance of the interviews to this study, the researcher personally administered the oral interview on one Chief Executive and three management staff from each of the two (2) selected ICT regulatory agencies in Abuja. This exercise took four (4) days in each of the two (2) ICT regulatory agencies making a total of eight (8) days. In doing this, a day was devoted to each of the interviewees due to the tightness of their operational schedules.

Method of Data Collection

The primary and the secondary methods of data collection were both employed in this study. In the primary method, the questionnaire and interview guide were used to collect data from the respondents. The secondary method of collection comprised the use of library materials such as books, newspapers, magazines, professional technical and trade journals among other sources. The internet sources such as Yahoo, Google and Devil Finder were also part of the secondary sources used for the study.

Method of Data Analysis

This study employed the use of questionnaire and oral interview guide to elicit information from the respondents. Accordingly, the quantitative and the qualitative methods of data analysis were used. Data collected through the use of questionnaire were analysed using tables which expressed simple percentages and frequency. The quantitative data used both the descriptive and inferential statistics

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such as Spearman's Ranked Correlation analysis, Binary Logistic Regression and Mann-Whitney U-Test.

Data collected through the qualitative method (interview) was analysed through the various themes which were derived from the research objectives and questions. Accordingly, the explanatory method of data analysis was employed in analysing qualitative data.

Validity and Reliability of the Instruments

The validity of test or method or instrument in any research refers to its degree of accuracy. In other words, the validity of a research instrument means its success in probing and/or assessing (measuring) what it sets out to probe or assess (Olaniyi, 2025). This explains why Agbe (1999) has asserted that the validity of an instrument is the extent to which it measures what it set out measure. To ascertain the reliability of the instruments designed for the study, a pilot study was carried out. In the pilot study, the research purposively sampled one print medium from the six (6) national newspapers (*The Nation*) one from the three (3) national magazines (*Newswatch*) and one from the seven (7) local/state newspapers (*The Voice* Newspaper of Benue State Government) across the six geopolitical zones and administered 10 copies of the questionnaire to each. All the copies of the administered questionnaire were collected after 2 days and the analysis showed that the items in the questionnaire were valid because they gave the researcher what he had set out to find.

Also, interviews were conducted with 2 people who were purposively selected from the Benue State Ministry of Science and Technology, Makurdi. The people interviewed included the Director Administration and Finance (DAF) and Director Strategic Planning and Research.The interview results also indicated that the interview guide was capable of testing what it was initially set out to test. In this wise, the instrument was adjudged to be valid to the study.

Reliability

Reliability refers to the consistency or dependability with which a measuring instrument assesses what it planned to measure. According to Keyton (2001), Adetayo (2019), if a measuring device varies randomly, there will be greater error and reliability will be lower. Olaniyi(2025)further asserts that, a reliable measure is one that is consistent and which gives similar results each time it is used.

To establish the reliability of the questionnaire instrument used for this study, 20 purposively selected journalists from *The Abuja Explorer* a local newspaper operating in Abuja were administered with the questionnaire. The minimum time interval between the first and second administration of the questionnaire was four weeks.

This strategy ensured that the recall of the questionnaire did not influence the respondent's opinion. The test-retest reliability was computed using the Pearson Product Moment Correlation Coefficient (*r*). The respondent's suggestions were

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used to affect improvement and development of the final instrument. The reliability coefficient of the questionnaire was found to be 0.712, implying that the correlation coefficient was high.

4. Results

A total of 347 copies of the questionnaire were administered on sampled respondents in selected newspaper and magazine establishments across the six (6) geopolitical zones of Nigeria. The distribution was 100% successful. However, 29 copies or 8.4% of the number distributed were not returned. Again, when the returned copies were critically examined, it was discovered that only 310 copies constituting 89.3% were useful. The remaining eight copies or 2.3% were rendered invalid because of multiple shading. This presentation is therefore, based on the 310 correctly filled and returned copies of the questionnaire.

Data Presentation

Table 2: Age Distribution

Age bracket	**Frequency**	**Percentage**
18 – 30 years	105	34
31 – 53 years	153	49.3
54 and above	52	16.7
Total	**310**	**100**

Source: Field Survey, March 2010

Data in Table 2 shows that respondents within the age range of 18 – 30 years where 105 (34%). Respondents aged 31-53 were 153 (49.3%) while the remaining 52 respondents, an equivalent of 16.7% were within the age range of 54 and above.

The implication of this data is that the sampled respondents are old enough to make valid contributions that will address the problem of the study. The dominance of respondents within the age range of 31-53 is consistent with the reality that this class of people actually dominates the workforce in both private and public sectors.From the foregoing, the responses of these people will be treated as a representation of the Nigerian print media under study.

Table 3: Gender Distribution

Sex	**Frequency**	**Percentage**
Male	219	70.6

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Female	91	29.4
Total	**310**	**100**

Source: Field Survey, March 2010

The Table 3 shows that 219 (70.6%) respondents were male while 91 (29.4%) respondents were female.The above data implies that the study was not biased against any sex as it cut across both males and females in the sampled newspapers and magazines from the six (6) geopolitical zones of Nigeria.

Table 4: Educational Distribution

Educational status	Frequency	Percentage
Diploma	60	19.3
First degree	135	43.5
PGD/Masters	110	35.4
Ph.D.	5	1.8
Total	**310**	**100**

Source: Field Survey, March 2010

The Table 4 shows that 60 (19.3%) respondents were diploma holders 135 (42.5%) were first degree holders 110 (35.4%) respondents were post graduate diploma/PhD holders. The above data on educational status of respondents shows that the study was executed among literate subjects with necessary knowledge to give valid responses to the questions contained in the questionnaire that was administered on them.

Table 5: Marital Status Distribution

Marital status	Frequency	Percentage
Married	163	52.6
Single	131	42.3
Widowed	16	5.1
Total	**310**	**100**

Source: Field Survey, March 2010

TheTable5shows 163 (52.6%) respondents were married, 131 (42.3%) respondents were single while the remaining 16 (5.1%) respondents were widowed.The data in

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table indicates that the study benefited from the varied experiences of every identifiable proportion of the sampled respondents in relation to social realities.

Table 6: Cadre of Staff Distribution

Calibre	Frequency	Percentage
Junior staff	62	20
Senior staff	162	52.2
Management staff	86	27.8
Total	**310**	**100**

Source: Field Survey, March 2010

The Table 6 shows data concerning the status of respondents in the hierarchy of the organisations under study. The data shows that staffs in the junior category were 62 (20%), respondents in the senior level were 162 (52.2%) while respondents occupying management position were 86 (27.8%).This breakdown shows that all categories of staff were sampled, making the responses representative of all calibre of staff at the various organisations under study.

Table 7: Distribution According to place of employment

Place of employment	Frequency	Percentage
Newspaper	253	81.6
Magazine	57	18.4
Total	**310**	**100**

Source: Field Survey, March 2010

Table 7 shows that 253 (81.6%) respondents were from newspaper organisations while 57 (18.4%) were from sampled magazine establishments.The data indicates that the entire print media in Nigeria which is the subject of this study was adequately covered. It is also deduced that, the sampled respondents were practising journalists whose views are relevant to the main thrust of the study.

Table 8: ICTs Utilization by journalists in their duties

Options	Frequency	Percentage
Computer	102	32.9
Internet	36	11.6
Mobile phone	114	36.8

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Fax machine	58	18.7
Total	**310**	**100**

Source: Field Survey, March 2010

From Table 8, data presented shows that 102 (32.9%) respondents utilize computer in the performance of their duties, 36 (11.6%) respondents have Internet facilities available to them at work, 114 (36.8%) respondents claimed to have Mobile phone as operational tool while 58 (18.7%) respondents have fax machine at their disposal in the performance of their duties.

It can be deduced from the foregoing data that the ability of the sampled respondents to properly place the identified ICTs in relation to their tasks of news gathering and dissemination shows that they have substantial understanding of the research subject.

Again, the fact that all the listed ICTs are variously in use by respondents in the performance of their duties indicates that modern ICTs are reasonably available to journalists in Nigeria. However, the 102 (32.9%) and 114 (36.8%) high points in the use of computer and mobile phones respectively by respondents, shows a disturbing incidence of lack of ICTs for some journalists to carry out their duties.

Table 9: Impact of ICT on newspapers/magazines

Options	**Frequency**	**Percentage**
Timely and in-depth coverage of news/event	20	6.5
Improved aesthetics and visual appeal	08	2.6
Wider readership and circulation	Nil	Nil
More advertising patronage	Nil	Nil
All of the above	282	90.9
Total	**310**	**100**

Source: Field Survey, March 2010

The Table 9 presents data on the impact of ICTs on print media operations. Out of the listed possible impact of ICTs, 20 (6.5%) respondents said that the new media enhance their timely and in-depth coverage of news, Eight respondents representing 2.6% felt that ICTs have improved the aesthetics and visual appeal of their newspapers and magazines. Majority of the respondents 282 (90.9%) felt that ICTs impact on all the listed options in their organizations.

The implication of this data is that, ICTs have impacted on a wide range of activities in print media organisations – especially in enhancing their corporate objectives.

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The understanding of the respondents of the impact of ICTs on their organisations is also relevant to the thrust of this study.

Table 10: ICTs enhancing competitive advantage

Options	Frequency	Percentage
Much	290	93.5
Not much	20	6.5
Total	**310**	**100**

Source: Field Survey, March 2010

The Table 10 tries to find out how the adoption of ICTs by newspapers and magazines is enhancing their competitive advantage over other media organisations. Two hundred and ninety (290) respondents representing 93.5% agreed that ICTs give them much competitive advantage over other media organisations while only 20 (6.5%) respondents were of the view that ICTs do not provide them much competitive advantage.This result shows that the respondents are actually from a section of the media that would not easily give up an advantage without being compelled or at least give strong justification for doing so.

Table 11: Profitability of newspaper/magazine

Options	Frequency	Percentage
Very profitable	26	8.4
Profitable	73	23.5
Fairly profitable	182	58.7
Not profitable	Nil	Nil
Can not say	29	9.4
Total	**310**	**100**

Source: Field Survey, March 2010

Data from Table 11 shows that 26 (8.4%) respondents said their newspaper/magazine outfits are highly profitable, 73 (23.5%) agreed that their organisations are profitable, majority, i.e. 182 (58.6%) respondents stated that their establishments are only fairly profitable while 29 (9.4%) respondents could not say anything on the question.

The majority opinion from this table shows that there are obvious challenges of readership and circulation of newspapers and magazines in Nigeria occasioned by market forces of demand and supply. Even though, the Nigeria Audit Bureau of

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Circulation (ABC), the only globally recognized body that can give valid circulation figures of newspapers and magazines has ceased to function, global realities of poor economy and poor reading culture show that the landscape of newspaper and magazine business is currently quite challenging.

Part II: Interview

The researcher conducted face-to-face oral interview with one chief executive and three management staff of the two selected ICT regulatory agencies in Nigeria viz; Ministry of Science and Technology, Abuja and the National Information Technology Development Agency, (NITDA) Abuja. To this end, four interviewees were selected and interviewed from each of the two agencies totally eight (8) interviewees. They were interviewed individually or separately on the same six (6) items (questions) which are presented below.

(1). Name and position.

(2). Would you say that ICT development in Nigeria has resulted into a Knowledge-Based Economy and Society?

Name and Position

Interview sessions were held with the following selected interviewees:

Federal Ministry of Sciences and Technology, Abuja

[1]. Mr. Istifanus Musa Faktur, Acting Director, Administration and Finance (for the Honourable Minister)

[2]. Mr. Ochepa Ogenyi, Director, Planning, Research and Policy Analysis.

[3]. Engineer Wahab Kolawole Jimoh, Director, Technology, Assessment and Acquisition.

[4]. Engineer Mohammed Yahaya Shashi, Director, Information Technology.

National Information Technology Development Agency

[1]. Professor Cleopas Angaye, Director General

[2]. Mr. Yinka Adejube, Acting Director, Infrastructure and Capacity Development.

[3]. Mr. Emeka Ezekwesili, Director, Strategic Planning and Research.

[4]. Mr. Inye Kem Abonta, Director, Standards and Regulations.

Factors that determine ICT policy formulation and regulation in Nigeria

The first interview sessions were held with Mr. Istifanus Musa Faktur, Mr. Ochepa Ogenyi, Engineer Wahab Kolawole Jimoh, and Engineer Mohammed Yahaya

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Shashi, from the Federal Ministry of Science and Technology, Abuja respectively. In their separate responses on what factors their organisation consider in ICT policy formulation and regulation in Nigeria Mr. Istifanus Musa Faktur said that, factors that determine the formulation of the National ICT policy and indeed, implementation are in most cases different from those that influence such policies at organizational or sectoral levels. According to him, the thrust of the National ICT Policy basically takes cognisance of the importance of ICTs in stimulating accelerated and sustainable socio-economic development. He explained that, as much as the synergy in the operations of his ministry with other sectors on ICT policy and implementation cannot be compromised, such organisations enjoy freedom to develop and implement their own ICT policies in line with their predetermined organizational goals. However, Mr. Faktur stated that, ICT policies at all levels in Nigeria are not allowed to depart radically from the National ICT Policy. The three other interviewees from the Ministry of Science and Technology separately expressed similar views on the factors that determine ICT policy formulation and implementation in Nigeria. On his part, Mr. Ochepa Ogenyi stated that basic considerations for ICT policy formulation need to insist on developing ICT infrastructures and personnel towards the attainment of a Knowledge-Based Economy and Society. According to him, the factors that interplay in ICT policy issues in Nigeria are obviously more serious than merely wanting to be current in the global ICT domain. Specifically, Mr. Ogenyi highlighted the following pertinent issues:

- The private sector is recognized as the engine for the effective and sustainable ICT policy. It is therefore considered vital for government to enter into strategic alliances, collaborations, and joint ventures with the private sector stakeholders for the actualization of the IT vision, which is to use IT as a vehicle for sustainable development and global competitiveness. In this regard, collaborative research and development activities among industry, higher educational institutes as well as private and public research institutes for software and hardware development is quite essential;
- Need to enhance indigenous capabilities for the local manufacture of ICT hardware, software and other accessories;
- To empower the youths to acquire IT skills and integrate IT into the mainstream of education and training;
- Incorporation of ICT knowledge and awareness in all sectors in order to promote IT diffusion in various aspects of national life;
- Enhance capacity and capabilities by ensuring that IT resources are readily available to promote rapid national development.

Engineer Jimoh further highlighted that, the aspiration of Nigeria to participate effectively and become a key player in the emerging information age underscores the strong political will by successive governments since 1999 to put in place a highly efficient information technology system driven by a vibrant ICT policy.

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The second interview session was held with sampled interviewees from the National Information Technology Development Agency (NITDA): Professor Cleopas Angaye, Yinka Adejube, Mr. Emeka Ezekwesili, and Mr. Inye Kem Abonta. In their remarks, they all identified socio-economic and political factors as pivotal to the formulation of ICT policy and implementation framework in Nigeria. Professor Cleopas Angaye,a Professor of Software Development, noted that the cultural context of ICTs in Nigeria and attendant micro and macro implications strongly determine ICT policy formulation and implementation. Professor Angaye stressed that, the pressure of globalisation makes it compelling and indeed, obligatory on Nigeria to develop appropriate ICT policy and implementation framework.

Similarly, Mr. Yinka Adejube said that, all the factors that determine the ICT policy in Nigeria were structured to facilitate tangible development across all sectors of the society and economy. On his part, Mr. Emeka Ezekwesili disclosed that, the need to translate ICT policy to actual development process led to the development of the ICT for Development Strategic Action Plan for Economic Sectors of Nigeria. Mr. Ezekwesili further explained that, the document which was sponsored by the United Nations Economic Commissions for Africa (UNECA) in collaboration with NITDA is aimed at encouraging investment in ICTs as well as appreciation of ICT as tools for a wide range of applications and infrastructure planning.

Has ICT development in Nigeria resulted to a Knowledge-Based Economy and Society?

On the extent to which ICT development in Nigeria has resulted to a Knowledge-Based Economy and Society, Mr. Istifanus Faktur commended the interest and efforts of successive governments in the country at ICT development. Mr. Faktur said that since March, 2001 when the Obasanjo administration first formulated the National Policy on Information Technology, there has been sustained political will to develop ICTs in Nigeria. The sincerity and commitment of government according to Mr. Faktur is evident in series of support especially the establishment and substantial funding of the National Information Technology Development Fund (NITDEF) in line with the prescription of the National Policy on Information Technology. Mr. Faktur concluded that, with ICT revolution in almost all sectors of the Nigerian economy and society, it is safe to say at this stage that ICTs are reasonably enhancing a Knowledge-Based Economy and Society in Nigeria.

On his part, Engineer Wahab Jimoh observed that, Nigeria is certainly not one of those countries that can be said to suffer excommunication in the information economy. Nevertheless, Engineer Jimoh said that there is still inequality in the level to which ICTs have resulted to a Knowledge-Based Economy and Society between Nigeria and industrially advanced countries of Europe, America and even in some Third World Countries such as Ghana, Egypt and South Africa. Similarly, Mr. Ochepa Ogenyi added that virtually, all aspects of our daily life; Economic, Social and Educational have been affected by the ICT revolution. Mr. Ogenyi noted that despite increasing sectoral interests and applications, the progress of ICTs in Nigeria is still being constrained by some socio-economic factors especially

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widespread poverty resulting into inability of many people and even organisations to acquire these technologies.

The views expressed by interviewees from NITDA were similar to those obtained from the various research subjects from the Federal Ministry of Science and Technology. However, Professor Cleopas Angaye warned that since efforts to produce these technologies locally have not yielded much positive result, Nigeria will certainly score low on the ICT infrastructural development and adoption scoreboard when compared to countries from where these technologies are imported into Nigeria. According to Professor Angaye, ICTs in Nigeria are so far doing well in creating new economic opportunities, social equity and improved service delivery in both private and public sectors.

Professor Angaye identified some specific areas in which ICTs are providing a knowledge-based Economy and society. In the banking sector, Professor Angaye said that many Nigerians not have forgotten the “tally numbers and long queues in the banks”. According to him, today, banking transactionscan be done in the comfort of our living rooms and offices. Professor Angaye pointed out that the terms “Electronic banking” and “Electronic Payments” are now familiar buzz words, but re-echoing however that these services would not have been possible without software both at the back and at the front end of the transactions. Today, Nigerians own international debit cards and do not have to carry cash during oversea travels, he said.

Apart from the banks, professor Angaye further stated that many businesses have migrated to the on-line environment: airlines tickets are now available at the press of a few computer buttons, hotels and hospitality industry, medical services as well as newspapers and magazines have improved service delivery through on-line presence and application of information technology.

Also, Yinka Adejube said that ICTs have brought enormous transformation in higher education for the knowledge and information society occasioned by trends in Open Distance Learning and Virtual University modes. According to Adejube, these technologies are opening new frontiers and extending learning opportunities using tools and environments that are flexible to the learner. Mr. Adejube disclosed that NITDA as part of its capacity development mandate in ICTs has awarded scholarship to many Nigerians through the National Information Technology Development Fund (NITDF). He concluded that, ICT development in Nigeria has not fully resulted to a functional Knowledge-Based Economy and Society, but “we will certainly get it right”.

Answering Research Question

The foregoing quantitative and qualitative data presented will further attempt to provide answers to the five research questions earlier formulated to guide the study. To refresh our memory, the research questionis:-

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1. What is the impact of the adoption of ICTs on the Nigerian print media in the performance of their functions?

Research question 1: What is the impact of the adoption of ICTs on the Nigerian print media performance of their duties?

The Tables 8, 9, 10 and 11 supply data that vividly answer this research question. The data contained in Table 8 show 90.9% respondents who identified timely and in-depth coverage of news/events, improved aesthetics and visual appeal, wider readership and circulation figures as well as more advertising patronage as measurable impact of ICTs on their newspapers/magazines. This is in addition to the remaining 6.5% and 2.6% who specifically mentioned timely and in-depth coverage of news/events as well as improved aesthetics and visual appeal as impact of ICTs on the operations of their newspaper/magazine outfits.

Furthermore, data from Table 9 show that 93.5% of the sampled respondents subscribed to the view that, ICTs are giving Nigerian newspapers and magazines much competitive advantage over other media of public communication particularly the relentless onslaught from the electronic media.

The Table 10 on its part provide data showing that the adoption of ICTs is by extension making Nigerian newspapers and magazines fairly profitable given the current globally acknowledged low circulation figures of print media products. This is the viewpoint of 58.7% respondents while 23.5% said that their newspaper/magazine organisations are profitable and another 8.4% are of the view that their outfits are very profitable.

Again, data contained in Table 11 have generated additional answers to research question three. In appreciating the values of modern ICTs to the operations of newspapers and magazines, majority of the sampled respondents 54.5% agreed with the statement that “Nigerian Journalists see modern ICTs as better than analogue system in the performance of their duties”. This data is quite significant as ICTs cannot make any impact in the Nigerian print media if journalists do not appreciate their relevance.

In a related development, the qualitative data generated from face-to-face oral interview on the question of whether ICT development in Nigeria has resulted to a Knowledge-Based Economy and Society provides relevant answer to this research question. One of the interviewees, Mr Istifanus Faktur, Acting Director, Administration and finance at the Federal Ministry of Science and Technology, Abuja confessed that ICT revolution among the Nigerian print media are reasonably enhancing a Knowledge-Based Economy and society in Nigeria.

Hypothesis I: *There is no significant impact of ICT on the performance of the print media in Nigeria.*

Using Tables (7) and (9) the Binary Logistic Regression was used to test this hypothesis. Logit regression is used in regression analysis where the response

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variable is a binary dependent variable (Hair et al., 2017; Hair et al., 2019). The implicit form of the model is:

$$ln\frac{P_i}{1-P_i} = z_i = b_0 + b_{1i}x_{1i} + b_{2i}x_{2i} + \cdots + e_i$$

Where:

Zi = Probability, which measures the total contribution of the independent variables in the model and is known as the logit; Zi is composed of Pi (probability of occurrence) and 1- Pi (probability of non-occurrence) (Olaniyi & Tayo-Ladega, 2024);

β_0 = The intercept, which is also the value of z when the value of all the independent variables is equated to zero;

β_i = the coefficient, which describes the size and nature of the contribution of X_i to *z* or effect of x_1 *on z*. A positive β_i means that X_i increases the probability of the outcome; a negative β_i means X_i decreases the probability; a large β_i means that the factor strongly influences the probability; while a near zero β_i means that the X_i has little influence on *z* (Oboh *et al.,* 2006; Olaniyi & Tayo-Ladega, 2024).

The use of ICT forms is assumed to have positive impact or increase the performance of journalists in the Nigerian print media. ICT forms examined in the study were computer, Internet, fax machine and mobile phone. These ICT forms were used as independent variables and then regressed on the performance of journalists. Thus, the explicit form of logit model is represented as follows:

$$z = ln\frac{P}{1-P} = lnY = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4$$

Where

Z = high performance (1) and low performance (0)

X_1 = use of computer

X_2 = use of Internet

X_3 = use of fax machine

X_4 = use of mobile phone

b1 = coefficient of x_1 or effect of x_1 on z (performance)

b2 = coefficient of x_2 or effect of x_2 on z (performance)

b3 = coefficient of x_3 or effect of x_3 on z (performance)

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b4 = coefficient of x_4 or effect of x_4 on z (performance)

Having worked the statistics (see Appendix F) also see Appendix G and H for coding procedure and detailed SPSS computer printout.

The result shows thus:

Log y = impact on performance of Nigerian journalists;

- Significant at 1% probability level; ** Significant at probability 5% level;

Log likelihood ratio = 96.567; Nagelkerke R2 = 51.1%; Chi-square statistic = 151.367; Significance of chi-square = 0.000

The result shows that the coefficient of the use of computer is positive (2.348). The t-ratio of the use of computer, represented by Wald, is significant at 0.01 level of probability (0.001). Implying that 1 percent in the use of computer will more than double the probability of the impact on the performance of journalists in the Nigerian print media.

Similarly, the coefficient of the use of mobile phone is positive (1.044); its t-ratio, represented by Wald, is significant (0.039) at 0.05 level of probability. This implies that 1 percent increase in the use of mobile phone will raise the probability of the performance of journalist in the Nigerian print media.

The constant is negative (-0.665) and significant (0.000) at 0.01 level of probability. This confirms the appropriateness of the specified variables in the logit model. In other words, in the absence of these explanatory variables, Nigerian journalists in the print media will not be able to perform well given the competition engendered by the evolution of ICTs.

The log likelihood, which determines the relationship between the explanatory and response variables is sufficiently high (267.469), indicating high performance in relation to use of ICT forms. The Nagelkerke R^2, which estimates how much of the variations in the probability of y is explained by the explanatory variables in the model, is 52.1 percent. Finally, the chi-square (X^2) for the distribution (151.367) is significant at 0.01 level of probability (0.000).

Based on the foregoing, the alternative hypothesis is accepted, implying that the use of ICT forms has significant impact on the performance of journalists in the Nigerian print media.

5. Conclusion

Deductions from the data generated by the study lead to the conclusion that, modern ICTs are relevant to print media operations especially newsgathering, processing and dissemination. The dominant ICT forms in use by print journalists undeniably impact on the operations of the print media in the areas of in-depth and

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speedy coverage of events, improved picture quality, wider readership and circulation as well as more advertising revenue.

Apart from the apathetic disposition of Nigerian journalists to changes in ICTs, poor reward systems for employees and lack of media focused ICT policy and implementation framework constitutes other areas of concern.It is recommended that the Nigerian print media need to be fully aware and most probably, apprehensive of the changing role of the print media in the emerging information economy as well as the impact of ICTs on print media operations. In this wise, the organisational support and investment in ICTs require urgent improvement. Also, there is also the need for continuous manpower development as a way of enabling the print media industry to embrace the values of ICTs in their operations. In this 21st century, print media managers should avoid any tendency to allow journalists and indeed, other employees to lag behind current trends in ICTs. Not only has the world-wide web (www) or Internet altered the pattern of information gathering, processing and dissemination, it has also brought with it the need for total re-examination of the manpower training and development of the Nigerian print media journalist.

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Conflicts of Interest

The authors declare no conflict of interest.

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Author Responsibility Statement

NGT: Conceptualization, Writing - original draft, Introduction, Method, Discussion, Conclusion. The author read and approved the final manuscript.