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RESEARCH ARTICLE

Usage of Information and Communication Technologies (ICTs) in the Nigerian Print Media Operations

Gabriel T. Nyitse, PhD

Department of Journalism and Media Studies, Bingham University, Karu, Nigeria.

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Corresponding Author: Gabriel T. Nyitse, PhD, Department of Journalism and Media Studies, Bingham University, Karu, Nigeria.

Abstract

This study is aimed at exploring the usage of Information and Communication Technologies (ICTs) in the Nigerian print media operations. The specific objectives are to identify the ICT forms that are currently in use, and to find out the current uses of ICTs by Nigerian newspapers and magazines. The survey research method was adopted using the questionnaire and oral interview as instruments for data collection. 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 speedy coverage of events, improved picture quality, wider readership and circulation as well as more advertising revenue. Notwithstanding the foregoing imperatives of ICTs in print media operations, the study again concludes that, ICT tools are not adequately and appropriately developed towards attainment of pre-determined organizational goals. The fact that ICT adoption among the Nigerian print media fails below the appreciable standards of adequacy is explained by obvious constraints of inadequate funding, illiteracy as well as lack of expertise and lack of training and retraining opportunities.This study strengthens the theoretical bases of Roger's Innovation Adoption Theory. The theory which provided the theoretical framework for this study identified the process of information sharing and attitude of members of a social system to adoption of innovation as sole factors that can influence people's thoughts and actions in the process of adopting such a new technology.

Keywords: ICTs, Magazines, Newspapers, Print Media.

1 Background of the Study

The press is the oldest known universal medium of communication after the spoken word and gesture. According to Gangwari (2001), Akinloye(2025), written communication between nations began following the invention of calligraphy, coupled with the use of papyrus in ancient Egypt. At that rudimentary stage, writing was by hand (manuscript), ofGangwari notes that:The pace, method and process of communication took a dramatic turn, when in 1445, a German scientist, Johannes Guttenberg of Mainz invented the moveable type. The new technique spread rapidly to other parts of Europe: Italy in 1463, France in 1470, England in 1476 and Russia in 1552. One of the earliest by-products of the invention was the newspaper. Gangwari (2001) further notes that, the first newspaper ever published was, Nieuwe Tydirghen. It appeared periodically between 1605 and 1610. It was published in Germany by Abraham Verhoeven. Two other German newspapers were published in 1609. These were Avisa Relation oder Zeitung, published at Wolfenbutted by Duke Heinrich Julius and Relation, published by Johann Carolus in Strassburg. The third newspaper namely Gedenckwurdige Zeitung, was published in Cologne, in 1610.

The adoption of the print technology led to the development of the press in many countries. In Switzerland, the first newspaper was published in

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1620, Austria, began her newspaper business in 1620, England printed her first newspaper in 1621, France in 1631, Denmark in 1934, Italy 1636, Sweden in 1645 and Poland in 1661.

Duyile (2007) explains that, Nigeria eventually joined the printing revolution through the efforts of missionaries who spearheaded the establishment of the print media soon after the end of slave trade. Calabar was the first city to host a printing press in 1846 following the efforts of a Presbyterian Church Minister, the Rev. Hope Waddell and his team. The Rev. Henry Townsend, a Church Missionary Society Minister, later brought a printing press to Abeokuta. The advent of printing technology in the country led to the establishment of the first newspaper in Nigeria, "Iwe Irohin" in 1859, and the training of the first set of Nigerian printers in Abeokuta and Calabar.

It is pertinent to state that in sub-Saharan Africa it took Nigeria 414 years (about four centuries) to adaptto the printing innovation after its invention, even though countries like Liberia and Ghana had their first newspapers in 1821 and 1885 respectively. Gangwari (2001) has identified some of the initial factors responsible for the establishment of the printing press in Africa to include colonialism, christianity and nationalism.

Between 1859 and 1914, about a dozen weekly newspapers were published at different periods in Lagos. According to Dare and Uyo (1996):the leading newspapers of the period were the Lagos Times, 1880; Lagos Standard, 1882; Eagle and Lagos Critic, 1883; Lagos Weekly Record, 1891; Lagos Standard 1894; Nigerian Chronicle, 1908; Nigerian Times, 1910 and Nigerian Pioneer, 1914.

Coleman (1968) also stated that for 40 years, the Lagos Weekly Record campaigned in defense of West Africa and Africans against alien white rule:the record was so powerful that at one time, on account of its uncompromising attitude in the national interest, all foreign advertisements were withdrawn, but it stood its ground unflinchingly. It was by far and away the best paper in West Africa.

As the quest for independence heightened, coupled with the improvement in printing technology, more newspapers came on stream between 1915 and 1960. Among the most important papers were African Messenger 1921, Nigerian Spectator 1921, Nigerian Advocate 1923, Nigerian Daily Times, 1926, Lagos Daily News 1927, Nigerian Daily Mail 1930, West African Nationhood 1930, The Comet 1933 and West African Pilot 1937.

Jakande in Duyile (2007) succinctly encapsulated the significance of the spread of newspapers in the development of Nigeria when he says: as a matter of fact, the war of independence was fought on the pages of the Nigerian Press. Not one shot was fired. But many thundering editorials were written. No blood was shed. But editors and writers went to prison, or were otherwise punished by the colonial powers for their writings. The Press was the instrument both of attack and of defense for the forces of nationalism who eventually secured from the British government the political independence of the Nigerian nation.

Arguably, it would have been difficult to bring the Nigerian state into being without the printing revolution and its surrogate, the press. Besides, the growth of the press led to the growth of literacy and spread of general enlightenment. The expansion of a literate society, increased commercial rivalry, proliferation of printers and the emergence of Pan-Africanist movement stimulated rapid growth in the industry.

A critical aspect of the revolution is the pace at which the changes came. Duyile (2007), Akinloye (2024a), Akinloye (2024b) contended that, if someone were to predict to pioneers of journalism in Nigeria that the Internet and computer system would replace their old presses, he would have thought him to be victim of madness or psychosis.

However, technology evolved in a spate beyond anyone's imagination, for as the press holds sway, humanity entered the era of photographic or pictorial communication with the advent of cinematography and television. Messages were not only printed, they could be seen and heard; a genre called audio-visual emerged. This transformed the world into an electronic age. Features of the electronic age include, among others, the cinema, videotape, projector and slide, radio and television, kinescope, telex, telephone and telegraph.

The combination of printing with the by-products of the electronic age has led to significant improvements and innovations in formatting, structuring and packaging of editorial contents. Unlike the situation before this period, news reports, feature articles, political commentaries, arts, sports, economic and business information and data are now better designed, packaged and presented. Many newspapers and magazines now feature special sections on information, economy, science and technology, property and real estate, tourism and travels, trade and industry, sports and entertainment, health and

job vacancies. Each item is packaged in a unique and refreshingly different manner to achieve optimum accessibility and usability.

The profound effect of printing technology on journalism the world over is attested to by Hanson (2005) who explained that, the year 1800 saw massive changes in the business side of publishing. According to him, initially, hand-powered flatbed presses could print not more than 350 pages a day, but the new powered rotary press invented in 1844 could print as many as 16,600 sections (not just pages) within the same period. He posited that, though these types still had to be set by hand, much as it was in Gutenberg's day, the introduction of the Margenthaler linotype-typesetting machine in 1855, sped up the printing process. The linotype machine remained the standard for typesetting until the age of computer composition.

The advent of electronics in the mid 1970s radically redefined copy processing. Since then, there has been a steady growth in information and communication technologies and their applications in the print media, especially in countries where technologies like Video Display Terminals (VDTs) were in use in the processing of copy. Commenting on the application of Video Display Terminals (VDTs), Idemili (1992) in Uwakwe (2005:205) states thus:the VDTs is a rudimentary kind of computer, which greatly reduces the stress of the editor. Modern newspapers in Nigeria later introduced VDTs in their newsrooms. VDTs have keyboards with attached television screens. Reporters and editors using VDTs write and edit on the keyboards attached to the video terminals. VDTs are placed in the hands of editors final control of what is set in type and consequently, what is published.

The Nigerian print media, right from Iwe Irohin, Duyile (1987) explained, has been characterized by a technically crude production since the modern printing technology was relatively unknown. According to Duyile, Henry Townsend, "made use of that which was available from the type case and setting strike". This scenario though improved upon as technology in the printing industry moved up, the industry was never on top of the technology until the evolution of ICTs.

Ekwelie (1986) captured the situation thus, "print communication in Nigeria has evolved from inky, boring pages to glittering picture-filled pages, adorned for good measure with cartoons and dingbats". Indeed, the Nigerian print media has continued to advance in information and communication technology in the areas of copy writing, reporting, editing, and page making.

In addition, virtually all the newspapers in Nigeria now employ computer-based technology in typographic designs and graphic presentation of information. Mastheads are not only beautifully designed in colour, the contents are presented in appealing layouts. Newspapers such as Thisday, The Nation, The Punch, The Guardian and many others splash their front, back and inner pages with colour for aesthetic appeal. The newsmagazines too use glossy back covers in addition to well-separated back-cover photographs.

However, this study is centered on the current uses and impact of Information and Communication Technologies (ICTs) in Nigeria among newspapers and magazines which constitute the print media. Notably the wide spectrum of casts and types in the country's media as facilitated by ICTs can be said to be responsible for the robust, colourful and engaging discourse in the print media. Despite the long period of colonial rule and its understandably adversarial press, the print media have remained the most enduring institutions with high record of commitment to the country's development.

The foregoing effort at putting the print media in context is to situate the idea of adoption of ICTs in print media operations within the framework of their socio economic, political and cultural responsibilities to the Nigerian people. Aspinal (1971) opined that, print media managers have long believed that organisational objectives of newsgathering and dissemination are unattainable without the application of ICTs. It follows therefore that, whether analogue or digital ICTs, these technologies are not completely new to print media journalism.

One major impact of ICTs on the print media is that, they have enhanced the democratization of information as everyone has the chance of joining the information superhighway or cyberspace. Consequently, information sharing is now in vogue. This development has not only improved the editorial contents of Nigerian newspapers and magazines; it has also, enriched their aesthetics and coverage. This is not to say that ICTs do not have the capacity to enrich the print media contents but under-capacity utilisation of ICT tools due to low literacy level of media practitioners may be the obstacle.

However, the Nigeria print media have hitched on the 21st century ICT bandwagon. Okoye (2000) disclosed that all Nigerian newspapers use the computer for various purposes. This development is increasingly adding value to print journalism in Nigeria. Commenting on the benefits of the Internet to the print media, Okoye (2000) further stated that, the Internet offers enormous advantages to publishing houses that

wish to grab the communication opportunities offered by the information superhighway. He described the Internet as:A tremendous windfall because it enables people to connect with people who would not ordinarily have access to their publications or information. The Internet provides a way for any publisher to impart information and furnishes input on key issues with no geographical barriers whatsoever.

Currently, most national newspapers and magazines in Nigeria are on the Internet; they own their Websites. They are online. This makes them accessible to global readership. The Internet has relatively enhanced the efficiency of Nigerian print journalists through sourcing of information to enrich and enhance their production, typesetting and design of copy. Similarly, the Internet has promoted the use of digital cameras for the production of high-quality photographs and easy access and transmission of information. The use of digital cameras and colour separation equipment has also, enhanced the aesthetic quality of newspapers and magazines that we are seeing today.

The introduction of Global System of Mobile Communication (GSM) in 2001 has, also, revolutionised the landscape of print journalism in Nigeria. Popoola (2003) explained that, the advent of the GSM has shaped and is still shaping the process of newsgathering and reporting in Nigeria. The arrival of the GSM has not only made reporting easy, it is, also, a big relief to reporters who hitherto found it extremely difficult to follow up on stories within deadline.

The adoption of ICTs especially computers in newspaper production is facilitating the printing of newspapers in different locations simultaneously. This development in technology has greatly eased distribution difficulties hitherto, encountered by newspaper organizations. The expansion of distribution networks in newspaper and magazine business has also led to increased advertisements and advertising revenue. The increase in advertisement and advertising revenue has largely addressed the critical issues of socio-economic sustainability of newspaper and magazine business in Nigeria.

While the adoption of ICTs in print media operations could be said to be part of the history of newspaper development in Nigeria, the relationship between these technologies and their full utilisation need to be properly understood. With the advent of ICTs, two words adequately describe the Nigerian journalist – adventurous and enterprising. However, it appears the Nigerian print media managers have not sufficiently repositioned their employees to fully embrace and appreciate the benefits of ICTs. The realities of these technologies require some continuous capacity building programmes to enhance the performances of the print media journalist.

The aim of the study is to explore the usage of Information and Communication Technologies (ICTs) in the Nigerian print media operations. The specific objectives are to identify the ICT forms that are currently in use among Nigerian newspapers and magazines; and to find out the current uses of ICTs by Nigerian newspapers and magazines. The objectives were further tested with the hypothesis which states that there is no significant relationship between the ICT forms currently in use among the Nigerian print media and the capability of journalists.This study covered the headquarters of selected newspapers and magazines across the six geo-political zones of Nigeria and the Federal Capital Territory (FCT).

2 Theoretical Framework and Related Theories

This study is anchored on Diffusion of Innovation Theory;however, Roger's Innovation Adoption Theory (1962) shall provide the framework for this study.

2.1 Diffusion of Innovation Theory

The Diffusion of Innovations Theory can be said to have been formulated in 1903 by Gabriel Tarde, a French sociologist who plotted the original S-shaped curve upon which the diffusion of innovations theory is now based. Tarde's proposition was further amplified by Rogers who observed that "most innovations have an S-shaped rate of adoption" (Rogers 1983). Diffusion of innovations took firm root in 1943 through the work of other sociologists, (Bryce Ryan and Neal Gross), when they published their seminal study on the diffusion of hybrid corn among lowa farmers in the United States of America (Kaiser et al., 2019). However, diffusion of innovations research was popularized by Everett Rogers in his studies of 1962, 1971, 1983 and 1995 (Abu-Salim, Mustafa, et al., 2019).

Although Ryan and Gross, and later Rogers, applied the diffusion of innovations to agricultural innovations (Ryan and Gross 1943, 1950; Rogers 1962, 1983, 1995), the theory is now generally applied to other areas including the print media.The diffusion of innovations theory traces the process by which a new idea or practice is communicated through certain channels, over a period of time, among members

of a social system. It also describes the factors that influence people's thoughts and actions in the process of adopting such a new technology or idea. According to Rogers, an innovation is "an idea, practice, or object that is perceived to be new adoption" while communication is "a process in which participants create and share information with one another to reach a mutual understanding" (Rogers, 1995; Adeniran, Olorunfemi & Akanmu, 2025).

In this context, communication is seen as a transfer of new idea from willing experts into the social system. It follows therefore that, all developments in general and changes in print media technology in particular, are innovations. Whether one is replacing an old method of production such as newspaper and magazine content, page making and design completely with a new approach by way of migrating from analogue to digital ICTs, or is working at removing undesirable consequences of an existing system, one is invariably introducing something new to the production process. What is introduced – the object of the effort – is the innovation (Moemeka, 2000). There are four main elements in the diffusion process, namely: the innovation, communication channels, time, and the social system.

The Innovation is the idea, practice or object that is perceived to be new. It has five characteristics: relative advantage (the degree to which an innovation is perceived as better than the idea it supersedes – migrating from analogue ICTs to digital ICTs in newspaper and magazine production processes), compatibility (the degree to which an innovation is perceived as being consistent with existing values, past experiences, and needs of potential adopters, that is publishers and print media journalists), complexity (the degree to which an innovation is perceived as difficult to understand and use (Cabosky, 2016). This characteristic points to the numerous challenges impeding the embracement of ICTs by Nigerian journalists), triableness (the degree to which an innovation may be experienced on a limited basis), and observableness (the degree to which the results of an innovation are visible to others).

Communication Channels are the means by which messages move from one individual to another. These could be mass media channels, (radio, television, Internet, newspapers, magazines etc) or interpersonal channels. Usually, mass media channels are more effective in creating knowledge about innovations while interpersonal channels are more effective in forming and changing attitude towards a new idea and thus, influencing the decision to adopt or reject the new idea.

Time is involved in the diffusion process in three ways. First, is the innovation-decision process which is the mental process through which an individual (or another decision-making unit) passes from first knowledge of an innovation, to forming an attitude towards the innovations to a decision to adopt or reject, to implementation of the new idea, and to confirmation of the decision (Cheng, Gan et al., 2019). This is why the innovation-decision process is seen as a five-step process consisting of knowledge (person becomes aware of an innovation and has some idea of how it functions), persuasion (person forms a favourable or unfavourable attitude towards the innovation), decision (person engages in activities that lead to a choice to adopt or reject the innovation), implementation (person puts an innovation into use), and confirmation (person evaluates the results of an innovation-decision already made). An individual usually seeks information at various stages of the innovation-decision process in order to decrease uncertainty about the innovation's expected consequences (Choshin & Ghaffari, 2017). The second way in which time is involved in the diffusion process is in the innovations of the individual/other unit of adoption. This is the degree to which the individual/other unit of adoption is early in adopting new ideas than other members of a social system. There are five adopter categories:

- ***Innovators*** (the first 2.5% of the individuals in a social system to adopt an innovation). These discerning individuals are change compliant. They are the first to try out a new technology or idea. They also help to spread information about the product or idea because they are naturally influential within the community (Njoku & Stephens, 2023).
- ***Early Adopters*** (the next 13.5% of the individuals in a social system to adopt an innovation) (Duan & Dholakia, 2017; Njoku & Stephens, 2023),
- ***Early Majority*** (thenext 34% of theindividuals in a social system to adopt an innovation) (Edim, Gbadegesin et al., 2025).
- ***Late Majority*** (the next 34% of the individuals in a system to adopt an innovation). These individuals adopt "wait and see" attitude to new technology or idea. They are not ready to take a risk but as soon as they notice that a new technology is working, they queue into it (Edim, Gbadegesin et al., 2025).
- ***Laggards*** (the last 16% of the individuals in a system to adopt an innovation). This group consists of people who are apathetic to change. Even when persuaded, it takes them a long time to decide(Edim, Gbadegesin et al., 2025).

The third way in which time is involved in the diffusion process is in the rate of adoption.

This is the relative speed with which members of a social system adopt an innovation and it is usually measured as the number of members of the social system that adopt the innovation during a given period of time.

The Social System is defined as a set of interrelated units that are engaged in joint problem-solving to accomplish a common goal. The members or units of a social system may be individuals, informal groups, organisations, and/or subsystems. A social system constitutes the boundary within which an innovation diffuses (Cabosky, 2016).

Rogers and Shoemaker (1996) agreed that the innovation referred to in the diffusion of innovation theory is usually a technological idea. Much as other ideas such as those on culture could be accommodated in the premise of the theory, it is hard to dismiss their view of technology innovation (Bueno & Gallego, 2021). One can see that their past diffusion research fits well with the dominant paradigm's focus on technology.

The diffusion of innovation theory at once bears relevance to the study. Basically, the theory serves as a foundation for every socially changed programme in the world. It is important to point out as already stated above that, following the invention of printing in 1445; it took Nigeria more than 400 years to embrace the technology (Ehikioya & Guillemot, 2020). This was facilitated by the effort of Rev. Henry Townsend, the Church Missionary Society Minster (Duyile, 2007). Apart from the delay in the advent of printing technology in Nigeria which underscores the relevance of the theory, it is equally a fact that, personnel that work in print media organisations are variously affected by the elements of the theory.

Besides illiteracy and lack of expertise, the absence of a clear-cut IT policy and high cost of ICTs are some of the factors that constitute impediments to the adoption of ICTs by journalists in print media operations(Hus, 2018; Ehikioya & Guillemot, 2020). It goes then to show that, their weak knowledge of ICTs affects their overall contributions to the social system. This development needs to be addressed. Research and experience have shown that the diffusion of innovation approach is highly effective in gaining adoption of many types of innovations such as information and communication technologies across variety of print media settings (Erkan & Evans, 2016). Figure 1 below presents a conceptual model of the diffusion of innovations theory adopted in this study.

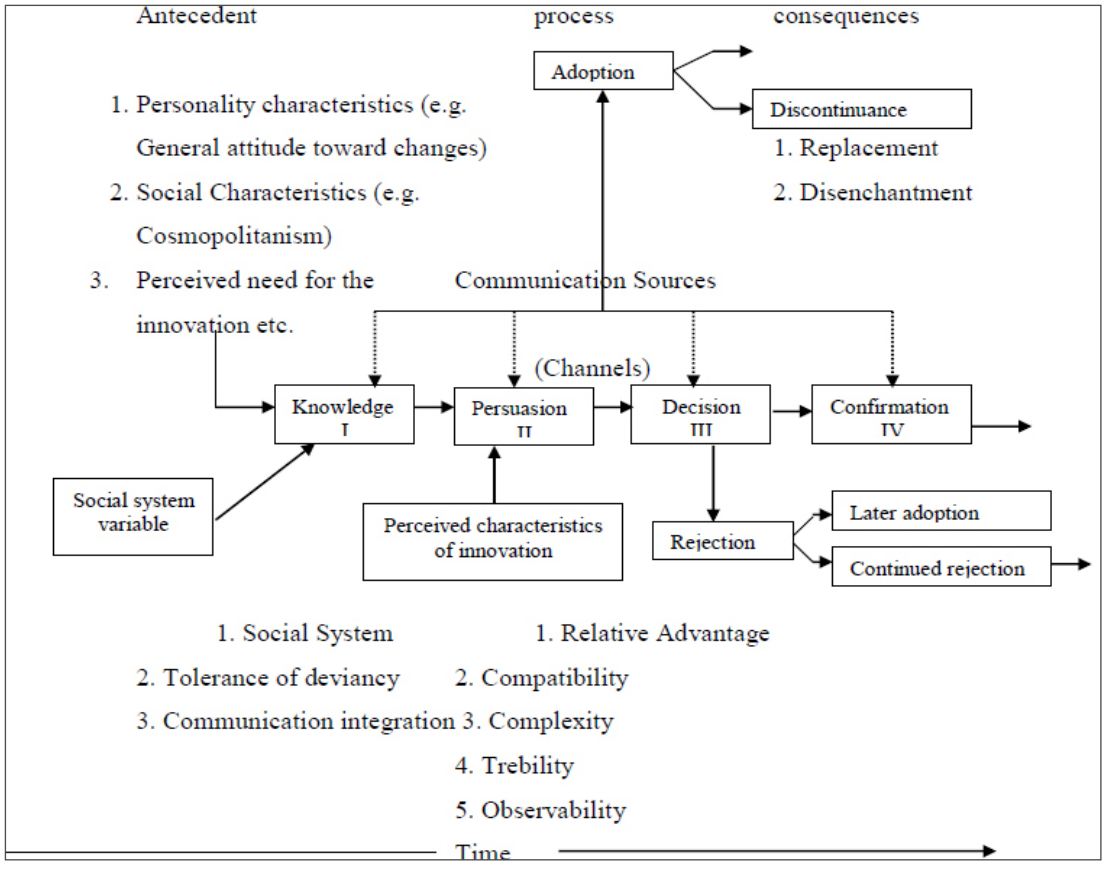

Figure 1. *The diffusion of innovations model*

Source. *Rogers (1995) Diffusion of Innovations*

Despite the fact that the Diffusion of Innovations does a good job of explaining how technologies are spread, critics of the theory however, concluded that, it is an overly simplified representation of a complex reality. In reviewing key criticisms of the theory, Rogers(1976), Dodgson and John (1996), Giao (2018), Essien and Etuk (2025) pointed out that a number of other phenomena can influence innovation adoption rates. One of these is that, customers often adopt technology to fit their needs; hence the innovation may actually change when moving from the early adopters to the majority of users. The theory failed to include these kinds of mutations.

Again, Rogers in the theory failed to appreciate that adopters often fall within different categories for different innovations: a current laggard can be an early adopter the next time depending on the kind of innovation.Another key criticism of the theory is its pro-innovation bias character. The pro-innovation bias is the implication that all members of the social system (Gogoi, 2021) should adopt the innovation. Indeed, new technologies offer wonderful promises for a better and brighter tomorrow.

Technological failures, however, sometimes bring about enormous catastrophes. Given their responsibilities to all citizens to improve society, effort would have been made in the theory to provide potential negative consequences rather than blindly accept the promises of new technologies.The theory is also criticized for being individual-blame bias (Alarifi,Alsaleh & Alomar, 2017). The individual blame-bias is the tendency to blame individuals for their non-adoption. It is true that some persons are laggards simply because they do not like change, are slow to understand new technologies, and so forth. However, the change apart must look beyond such individualistic explanations to fully appreciate reasons behind non-adoption because not all laggards are ignorant, resistant to change or otherwise personally predisposed to reject new technologies (Asadi & Hemadi, 2018). The theorists needed to have fully investigated how the characteristics of an innovation in relation to factors such as religious beliefs, economic constraints, non-availability etc might influence some persons to be laggards.

3 Methodology

3.1 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.

3.2 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); Njoku and Stephens (2023) 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. This was justifiable because the researcher understood that 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. Thus =355.

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).

3.3 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.

3.4 Interview

To select sample for the oral interview, the purposive sampling technique was adopted. The merits were identified in the study of Adeniran and Tayo-Ladega (2024). 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: 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:

3.5 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

3.6 National Information Technology Development Agency (NITDA)

- Director General – 1 interviewee
- Infrastructure and Capacity Development Department – 1 interviewee
- Strategic Planning and Research Department – 1 interviewee
- 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.

4 Research Instruments and Administration

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

4.1 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.

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).

4.1.1The Research Assistants Administered the Questionnaire to Sampled Respondents as Follows:

a. North Central and North East-2research 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.

4.2 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.

4.3 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.

4.4 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 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.

4.5 Validity and Reliability of the Instruments

The validity of test or method or instrument in any research refers to its degree of accuracy (Olaniyi, 2025). 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 (Adetayo, 2019). 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 (Hair et al., 2017; Hair et al., 2019). 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.

4.6 Reliability

Reliability refers to the consistency or dependability with which a measuring instrument assesses what it planned to measure. According to Keyton (2001); Adetayo (2025), if a measuring device varies randomly, there will be greater error and reliability will be lower. He 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 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.

4.7 Data Presentation and Analysis

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.

4.8 Data Presentation

Table 1. *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 1 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 2. *Gender Distribution*

Sex	Frequency	Percentage
Male	219	70.6
Female	91	29.4
Total	310	100

Source. *Field Survey, March 2010*

The Table 2 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 3. *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*

Table 3 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 necessaryknowledge to give valid responses to the questions contained in the questionnaire that was administered on them.

Table 4. *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*

The Table4 shows 163 (52.6%) respondents were married, 131 (42.3%) respondents were single while the remaining 16 (5.1%) respondents were widowed. The data in tableindicates that the study benefited from the varied experiences of every identifiable proportion of the sampled respondents in relation to social realities.

Table 5.*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 5 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 6. *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*

The Table 6 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 7. *ICTs Utilization by journalists in their duties*

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

Fax machine	58	18.7
Total	310	100

Source. *Field Survey, March 2010*

From Table 7, 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 8. *Journalists use of ICTs in their duties*

Options	Frequency	Percentage
Interviewing	50	16.1
Production/packaging	10	3.2
Distribution of newspapers/ magazines	04	1.3
Data banking/retrieval	36	11.6
All of the above	210	67.8
Total	310	100

Source. *Field Survey, March 2010*

The Table 8 has data on the opinions of respondents concerning the specific roles to which they deploy ICTs in the performance of their duties. Results indicate that 50 respondents representing 16.1% identified interviewing as a function which ICTs facilitate for them, 10 (3.2%) respondents said they use ICTs for production and packaging purposes, 4(1.3%) respondents are of the opinion that ICTs enhance the distribution of newspaper/magazine, 36(11.6%) respondents identified data banking and retrieval as the role which ICTs assist them to perform. Majority of the sampled respondents 210 (67.8%) are of the view that ICTs are useful to them in all the listed functions.

The divergent views of the sampled respondents can be interpreted to be a function of their training and preparation. Again, the majority opinion that ICTs find expression in all the listed roles shows that the sampled respondents substantially understand the synergy in the newspaper and magazine production processes. This shows that they are aware of the role's ICTs can play in stimulating journalists to optimum productivity. This equally gives credence to their responses to questions in the study.

Table 9. *Regularity of ICT training*

Options	Frequency	Percentage
Very regularly	Nil	Nil
Regularly	Nil	Nil
Irregularly	46	14.8
Only initial training	194	62.6
Can not say	70	22.6
Total	310	100

Source: *Field Survey, March 2010*

The Table 9 seeks to know how often journalists embark on ICT training. Surprisingly, only 46 (14.8%) respondents said they receive training irregularly while 194 (62.6%) said they received only initial training.

This data show that majority of print media organisations do not have retraining staff development capacity building programme for staff. Commenting on the importance of staff development, Lawson (2000) stated that, "the days are certainly gone

when government - even a local authority could control its operations by relying wholly on the appointment qualification of the staff".

Table 10. *ICTs journalists are able to buy*

Options	Frequency	Percentage
Laptop, desktop, GSM and Internet facilities	47	15.2
Laptop and GSM telephone only	154	49.7
Laptop computer only	Nil	Nil
Desktop computer only	Nil	Nil
GSM telephone only	96	30.9
None of the above	13	4.2
Total	310	100

Source. *Field Survey, March 2010*

Data from Table 10 seek to know which ICT tools journalists are able to personally buy. Results show that 47 (15.2%) are able to buy laptop, desktop, GSM and Internet facilities. One hundred and fifty-four 154 respondents representing 49.7% claimed that they are able to personally buy laptop and GSM telephone only, 96 (30.9%) respondents could only buy GSM telephone while the remaining 13 (4.2%) respondents are unable to buy any of the identified ICT tools.The implication of this data is that, whereas some journalists fairly have access to modern ICTs, a large number of Nigerian journalists still do not have these facilities at their disposal. This is dysfunctional because of the normal expectation that, the journalist of this era must necessarily be a technician whose competence on the computer and indeed, other ICTs should not be in doubt.

Table 11. *Nigerian journalists view of modern ICTs and consistency in newsgathering, packaging and dissemination*

Options	Frequency	Percentage
Strongly agree	Nil	Nil
Agree	5	1.6
Neutral	8	2.6
Disagree	83	26.7
Strongly disagree	214	69.1
Total	310	100

Source. *Field Survey, March 2010*

Responses from Table 11 show that none of the respondents strongly agree with the above statement. However, 5 (1.6%) respondents agree, 8(2.6%) were neutral, 83 (26.7%) disagree while an overwhelming percentage of 214 (69.1%) respondents strongly disagreed with the statement.The implication is that Nigerian journalists appreciate the value of ICTs in relation to their tasks of timely and accurate news gathering and dissemination.

4.8 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.

- Name and position.
- What factors does your organisation consider in ICT policy formulation and regulation in Nigeria?
- How does the existing ICT policy document recognise the mass media?
- What is your policy direction towards improvement of print media infrastructures and personnel?
- Would you say that ICT development in Nigeria has resulted into a Knowledge-Based Economy and Society?
- What are the possible measures that can improve the existing ICT policy and implementation framework in Nigeria in relation to the role of the print media?

4.9 Name and Position

Interview sessions were held with the following selected interviewees:

4.10 Federal Ministry of Sciences and Technology, Abuja

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

ii. Mr. Ochepa Ogenyi, Director, Planning, Research and Policy Analysis.

iii. Engineer Wahab Kolawole Jimoh, Director, Technology, Assessment and Acquisition.

iv. Engineer Mohammed Yahaya Shashi, Director, Information Technology.

4.11 National Information Technology Development Agency

i. Professor Cleopas Angaye, Director General

ii. Mr. Yinka Adejube, Acting Director, Infrastructure and Capacity Development.

iii. Mr. Emeka Ezekwesili, Director, Strategic Planning and Research.

iv. Mr. Inye Kem Abonta, Director, Standards and Regulations.

5 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 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.

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.

5.1 How ICT Policy Recognizes the Print Media

On the issue of how existing ICT policy in Nigeria recognise the print media, the researcher variously interviewed sampled interviewees from the Federal Ministry of Science and Technology and NITDA who provided similar responses. Both Mr. Ochepa Ogenyi and Mr. Istifanus Faktur from the Federal Ministry of Science and Technology admitted that apart from the advocacy role assigned to the media, they are not aware of any specific policy towards improvement of the print media structures and personnel.

However, Mr. Ogenyi noted that the major thrust of Nigeria ICT policy is the need to enhance IT capability to enable us become key player in today's information society. He stressed that; this can only be done through the development and appropriate deployment of ICTs hardware and ICT applications and improvement in information/data gathering, storage, retrieval and dissemination. According to Mr. Ogenyi, the mass media and ICT policy makers are professional partners in the important enterprise to create IT awareness and to ensure universal access.

Specifically, Mr. Ogenyi noted that the existing ICT policy encourages the mass media to:

- Create IT awareness among the populace;
- Ensure access to IT infrastructure;
- To liaise with appropriate government agencies to establishing IT awareness machineries at Federal, State and Local levels and encourage private sector participation in exposing Nigeria to the use and benefits of IT;
- Creating National data base in various aspects of the nation's socio-economic and political activities etc, in collaboration with ministries, departments and agencies.

Both Mr. Ogenyi and Mr. Faktur summarily, agreed that the mass media especially the print media have critical roles to play in the implementation of ICT policy in Nigeria. According to Mr. Faktur, the print media should be able to key into the general development blueprint offered by the existing ICT policy document. Hopefully, Engineer Mohammed Yahaya Shashi, also from the Federal Ministry of Science and Technology said that their parastatal (NITDA) is making good its mandate by sharpening the existing ICT policy in line with functional realities. Engineer Shashi acknowledged that, the Ministry cannot afford to overlook the print media in ICT policy formulation and implementation as that will adversely affect the entire vision of the policy especially as it relates to awareness creation.

From NITDA, Professor Cleopas Angaye, Mr. Yinka Adejube, Emeka Ezekwesili and Mr. Inye Abonta similarly admitted that both the National IT Policy and ICT for Development Strategic Action Plan have no clearly specified policy and implementation framework for the media. Professor Angaya however, insists that the advocacy role assigned to the media in the two documents is consistent with the traditional roles of the media in information dissemination and mass mobilization. Mr. Inye Abonta however, reasoned differently when he clearly admitted that NITDA in collaboration with its parent Ministry need to do more in providing a broad ICT policy that will facilitate media operations in Nigeria. Mr. Abonta specifically requested the researcher to avail the agency with the final copy of this research.

5.2 ICT Policy Towards Improvement of Print Media Infrastructures and Personnel

On whether the two organisations responsible for ICT policy formulation and regulation in Nigeria have any policy direction towards improvement of print media infrastructures and personnel, Mr. Istifanus Faktur said that the National ICT Policy did not provide specifically for improvement of print media infrastructures and personnel. Mr. Faktur explained that, even though the National ICT policy provides specifically for some key sectors of the economy, the broad objective is to stimulate overall development of ICTs in Nigeria.

On his part, Mr. Ochepa Ogenyi said that the failure of the National ICT policy to make a specific provision to enhance the capacity of the print media for effective service delivery has not recorded any obvious negative impact on the media industry. Mr. Ogenyi further said that the ICT adoption level among the Nigerian print media is relatively reasonable stressing that almost all the national newspapers and magazines currently have online editions. Admitting that the print media can play useful roles in ICT advocacy towards attaining a Knowledge-Based Economy and Society, Mr. Ogenyi said that the need to have a policy that focuses on the print is certainly overdue noting that the existing policy aims at achieving the following:

- Enhancing the capacity and capabilities of media practitioners;
- Provision of IT grants and infrastructures to print media houses to promote greater awareness;
- Joint collaborative efforts such as sponsoring of workshops, seminars, training tours etc,
- Partnerships in promotion and popularization of ICT at all levels.

Professor Cleopas Angaye and Emeka Ezekwesili also said that both the National ICT Policy and the ICT4D Action Plan have no clear-cut policy for the print media. According to them ICT development among the Nigerian print media in terms of infrastructures and application is quite encouraging, maintaining that it is difficult to say whether the success is a function of government policy or private sector initiative.

According to Professor Angaye, his agency is currently reviewing the checklist for evaluation of the ICT4D Action Plan and hope that, the review will address such critical issues.

5.3 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 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 softwares 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".

5.4 Measures to Improve ICT Policy and Implementation Framework in Nigeria

On measures to improve ICT policy and implementation framework in Nigeria, Professor Cleopas Angayebasically acknowledged that IT development in African countries including Nigeria is still being hampered by lack of adequate political will to fully support and embrace new technologies. Professor Angaye suggested that the multi-sectoral approach to ICT development and in operationalising the policy should be strengthened. He noted that the benefits of IT have not sufficiently trickled down the grassroots which partly account for why NITDA introduced the Rural Information Technology Centres (RITC) at the State and Local Government levels. The aim according to him is to help bridge the internal digital divide in the country. Professor Angayeenjoined the banks and the financial sector to invest in the Research and Development (R and D) efforts that would give birth to truly Nigerian banking software. The Professor of Software Development also emphasised the need to subject the IT policy to constant monitoring and periodic evaluation in line with its objectives. This strategy according to him will help the policy and implementation framework key properly into new world trends.

Engineer Jimoh on his part called on the government to increase its funding of ICT in Nigeria so that the required expansion in the current policy and implementation strategies can be accomplished at the right time. Yinka Adejube on his part said that the National ICT Policy should urgently emphasize local infrastructure and capacity development which according to him will resolve so many challenges of ICT adoption. Mr. Adejube stressed that local content like language software must become more accessible and affordable to guarantee smooth application of these technologies across all the sectors of the Nigerian society and economy.

On his part, Engr. Mohammed Yahaya Shashi from the Federal Ministry of Science and Technology stressed the need for public and private partnership in ICT policy formulation and implementation strategies in Nigeria. This approach according to him will greatly sustain ICT development in Nigeria, saying that the need to develop a broad base ICT policy in Nigeria should accommodate inputs from the private sector as well as individuals with relevant expertise.

5.4.1 Research Question 1: What are the Dominant ICT Forms Currently in Use among Nigerian Newspapers and Magazines?

The Tables 7 and 20 particularly but not exclusively provide data that answer this research question. Data contained in table 7 indicates that 32.9% of the sampled respondents claimed to have computers in the performance of their duties while 11.6%, 36.8% and 18.7% said they have Internet, mobile phones and fax machines respectively.

The Table 10 on its part addressed the issue of the ICT forms which journalists are able to buy. Data from the table show that, slight majority of 49.7% of the sampled respondents are only able to buy laptop and GSM telephone, while only 15.2% claimed to have personal Internet facilities that enhances their operations.

As much as the data contained in Table 7 and 20 identified the above dominant ICTs as reasonably available for journalists in the performance of their duties, Table 9 tied their procurement largely to availability of funds. This is supported by majority of respondents 53.5% who backed this viewpoint against 27.8% and 7.8% respondents who attributed ICT procurement in their organisations to journalists' efficiency at work and organisational policy respectively.

The above picture of funding as a key factor in ICT procurement for print media workers means that the dominance of some ICT forms over others does not translate to their availability or adequacy. Majority of

the sample respondents 91.9% backed this viewpoint against 8.1% who considered these ICTs adequate in the performance of their duties.

5.4.2 Research Question 2:What are the Current Uses of ICTs by Newspapers and Magazines in Nigeria?

Many tables in the study provide data that answer this question. Basically, table 6 shows that ICTs are useful in newspaper and magazine production. Data from this table indicate that 81.6% of the research subjects who provided functional responses to the issue of the current uses and impact of ICTs on the Nigerian print media were from newspaper organizations while 18.4% were from magazine establishments.

The Table 8 provides data that answer this research question with greater clarity as majority of the sampled respondents, 67.8% identified interviewing, production/packaging, distribution, and data banking/ retrieval as current uses of ICTs in their newspaper and magazine organisations. This is in addition to 16.1% and 11.6% of the research subjects who specifically identified interviewing of news sources and data banking retrieval as current uses of ICTs in their organisations.

The Table 11 on its part strongly validates the various data that answered this research question when 69.1% of the research subjects strongly disagreed with the statement that "Nigerian journalists do not see modern ICTs as consistent with their needs of newsgathering, packaging and dissemination".

5.5 Test of Hypotheses

The five research questions earlier raised to guide this study (See pp 15 – 16) provided the basic premise on which the testing of hypotheses was predicated. The kernel of this study which is best captured in researchquestions one, three and four were converted to three null hypotheses. In this section, a recap of these hypotheses is necessary to refresh our memory.

$H0_1$: There is no significant relationship between the ICT forms currently in use among the Nigerian print media and the capability of journalists.

Hypothesis I: There is no significant relationship between the ICT forms currently in use among the Nigerian Print media and the capability of journalists.

Hypothesis one was tested using the Spearman's Ranked Correlation Analysis. The relevant data used for testing this hypothesis were gottenwhich generated data on ICT forms being used by journalists and how they bear on their work.

The formula for Spearman's Ranked Correlation analysis is:

Where = Spearman's Ranked Correlation Coefficient

D = Differences between the ranks

N = Sample size

Spearman's Ranked Correlation Analysis determines the nature of relationship between two variables (x and y) that are qualitative or measured on ordinal scale (Oboh et al., 2006; Njoku, & Stephens, 2023; Asifat et al., 2024).. Where p is significant, it implies that as x increases, y also increases and that the Ns is not due to error of randomization but real.

The result shows that

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed)

The analysis shows that the correlation coefficient between the use of mobile phone and enhancement of duties is positive (0.195), and it is significant at 0.01 level of probability (0.001). This result implies that at 1 percent use of mobile phone, the performance of the duties of journalists is enhanced by 0.195 units.

Similarly, the correlation coefficient between the use of computer and enhancement of duties is positive (0.179), and it is significant at 0.01 level of probability (0.002). This result implies that at 1 percent use of mobile phone, the performance of the duties of Nigerian journalists is enhanced by 0.179 units.

Finally, the correlation coefficient of the use of fax machine and duty enhancement is positive (0.126) and significant (0.026) at 0.05 level of probability, indicating that 1 percent use of fax machine increases duty enhancement by 0.126 units.Thus, the alternative hypothesis is accepted implying that there is significant relationship between forms of ICT used (mobile phone, computer and fax machine) and duty enhancement of journalists.

6. Conclusion

The study explored the usage of Information and Communication Technologies (ICTs) in the Nigerian print media operations. The specific objectives are to identify the ICT forms that are currently in use, and to find out the current uses of ICTs by Nigerian newspapers and magazines.

The survey research method was adopted using the questionnaire and oral interview as instruments for

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

Notwithstanding the foregoing imperatives of ICTs in print media operations, the study again concludes that, ICT tools are not adequately and appropriately developed towards attainment of pre-determined organisational goals. The fact that ICT adoption among the Nigerian print media fails below the appreciable standards of adequacy is explained by obvious constraints of inadequate funding, illiteracy as well as lack of expertise and lack of training and retraining opportunities.

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 was 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.

There is the need for general improvement in the Nigerian economy, large – scale development in the telecommunication and energy sectors, and a level of liberalisation required to create an investment friendly climate. The present national policy on commercialisation and deregulation in Nigeria is a step in the right direction. Appropriate security measures required to protect both human and material resources in Nigeria will guarantee local and foreign investment in these sectors.

The present National ICT Policy in Nigeria needs to be upgraded in line with current global trends. A clearly defined media focused ICT policy and implementation framework aimed at developing media infrastructures and personnel is an imperative. This will give concrete expression to the political agenda and other socio-economic programmes contained in ICT4D document.

This study strengthens the theoretical bases of Roger's Innovation Adoption Theory. The theory which provided the theoretical framework for this study identified the process of information sharing and attitude of members of a social system to adoption of innovation as sole factors that can influence people's thoughts and actions in the process of adopting such a new technology.

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