

# Attitude of Lagos Editors towards Use of Artificial Intelligence in News Management

Bolu John Folayan, PhD<sup>1\*</sup> Olubunmi Ajibade, PhD<sup>2</sup> Toyin Segun Onayinka, PhD<sup>3\*</sup> Amira Obi-Okoye<sup>4</sup>

1. Department of Mass Communication, The Federal Polytechnic, Ilaro,  
P.M.B. 50, Ilaro Ogun State Nigeria

2. Department of Mass Communication, McPherson University,  
Seriki-Sotayo, Ogun State, Nigeria

3. Department of Mass Communication, Federal University Oye,  
Oye-Ekiti, Nigeria

4. School of Communication, Lagos State University,  
Ojo, Lagos, Nigeria

Email of Corresponding Author: [bolujohnfolayan@gmail.com](mailto:bolujohnfolayan@gmail.com) +234-8071790753

## Abstract

This study aimed to discover and suggest feasible steps towards integrating artificial intelligence (AI) into news gathering in Nigeria. Traditionally, news gathering starts from the Newsroom, goes through several processes before it gets to the reader in print or on air. This entire process has been radically transformed by modern technology. In contemporary news management, the involvement of humans in the news management process is being increasingly reduced and in many cases, replaced with machines. In the present study, the researchers investigated the preparedness of print and online media editors in Nigeria to use Artificial Intelligence (AI) in news management. The ground tour questions in the research were: To what extent are editors prepared for use of AI in news management; and what is the major challenge that Nigerian editors face in integrating AI in their news management process? The Diffusion of Innovation (DOI) theory provided theoretical underpinning for the study. Editors of leading online and print newspaper editors selected from Lagos, the media hub of Nigeria, were interviewed after completing a structured questionnaire. Results show most of the editors are not adequately prepared for the challenges of infusing AI into their Newsroom management.

**Keywords:** Attitude, Artificial Intelligence, Editors, News management.

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## Introduction

In journalism, news is *tidings; the report or account of recent events or occurrences as a subject of report or talk*. News is not the newsworthy event itself, but rather the 'report' or 'account' of that newsworthy event. The manner of presentation of a new information is what constitutes news. Thus, 'news' is a production of many complex factors which include media ownership, political system and ideology, people involved in media (senders and receivers), level of economic development and *technology*. (Venkatesh, Morris, Davis, & Davis, 2003).

Technology has radically transformed the entire news publishing process – the most fundamental in this regard being the introduction of computer systems. (Edwards, 2017). The computer work station effectively replaced typewriters and seamlessly substituted short-hand writing with tape-recorders. But lately, instead of merely aiding humans in the news production process, technology has been trying to 'replace' humans with machines. The praxis, known as Artificial Intelligence (AI) is the theory and development of computer systems to perform tasks normally requiring human intelligence. This development has fundamental implications on the practice of journalism, especially news management.

## Problem Statement

The world is moving very rapidly to what has been aptly described as the Fourth Industrial Revolution. While the three previous revolutions – automation, steam engine, electricity and digital revolution practically eluded Africa and provided little economic transformation, the new revolution is predicted to affect more positively those who are educated, ready and equipped – including African nations. (Folayan, 2022). The Fourth Industrial Revolution refers to disruptive technologies such as the Internet of Things (IoT), robotics, Virtual Reality (VR) and Artificial Intelligence (AI). (Odediran, 2020). According to Odediran, a media technologies expert, AI was founded on the assumption that human intelligence can be so precisely described that a machine can be made to simulate it. He notes:

Technology adoption in the mass media is crystalizing into terms such as “robotic reporter”, “robot journalism”, “automated journalism” and “programmable advertising”. These terms have one thing in common: The use of algorithms, artificial intelligence (AI), software and natural language processing (NLP) techniques to produce media content.

(Odediran, 2020)

Today in many countries where journalism is more advanced, news gathering, news interpretation, story editing, photo-journalism, layout and design distribution are gradually being handled by AI. Drones, for example, are being used as “reporters” to cover wars, filing stories, taking pictures and transmitting them almost directly to media audiences. There are works that reporters can do without machines, but such works take longer time to accomplish. The efficiency of AI tends to also be better than human efforts in some circumstances (knightfoundation.org, 2021). These compelling reasons make traditional and online news organizations to look into the direction of AI.

AI differs from traditional software in the sense that it does not just automate tasks or make manual works easier; it actually gets smarter on its own, learning to do the tasks better and better the more it learns.

To what extent are Nigerian news organizations ready for this radical innovation which has potentially positive and probably also some negative impact on professional practice and profitability? In what areas can or should AI be deployed at the moment in Nigeria? Unfortunately, not many studies have been done in the area of AI and journalism in Nigeria. (Folayan, 2022).

A fairly recent study by Okiyi and Nsude sought to know the challenges of deploying AI to journalism practice in Nigeria. They found “technical and structural challenges” in this regard but the investigation did not provide specific details on the nature of the challenges and their solutions. (Okiyi and Nsude, 2020). This investigation is expected to fill this knowledge gap.

### **Research Questions**

1. How prepared are Nigerian news organizations for Artificial Intelligence in the management of news?
2. What are the critical challenges facing the integration of Artificial Intelligence into the management of news?
3. What is the potential impact of lack of deployment of Artificial Intelligence in news management in Nigeria?
4. What are the solutions to the challenges of applying of Artificial Intelligence to news management in Nigeria?

The study covers only print and online news organizations (excludes radio and TV organizations) essentially because the needs of AI in the latter is fundamentally different from the former. Editors who participated in the study were drawn exclusively from Lagos. The city, for over 100 years, has remained the media hub of the country.

### **A Review of Related Literature**

#### ***The Concept of Artificial Intelligence in Journalism***

As noted earlier, Artificial Intelligence (AI), the theory and development of computer systems to perform tasks normally requiring human intelligence, is fundamentally shaping virtually all professional practices, including mass communication and journalism.

Automation algorithms are now widely used in the social media and marketing communications to detect frauds, determine social media feed, handle customer complaints, and display shoe ads that follow online media users. For example, in marketing communications, AI is used to write email, subject lines and adopting Chabot for websites. Marketingintelligenceinstitute.com investigated how large marketing firms deploy AI for communications and found that they use machines to write, speak, read and hear and understand natural language (NLG), such as completing sentences, writing content, correcting language grammar, syntax and errors, transcribing audio to text, predicting contents that will perform best and completely re-writing them in specified formats. (marketingintelligenceinstitute.com, 2021). The research sought to know how AI was deployed for the marketing of a product, *Tomorrow Sleep Boosted* and found that after several months of launch to manually boost traffic online by tracking key words analytics, the management got only 4,000 visitors to the website monthly. But when the management adopted AI software, the app helped to boost the traffic by 10,000 per cent (from 4,000 visitors to 400,000 monthly visits.), and ranked for multiple positions in a single search result. The AI software helped to identify the topics that the company needed to be talked about by potential customers and determined where competitors ranked, among others. In another study, marketingintelligenceinstitute.com investigated how *E-bay* (one of the world’s largest marketing organizations) used AI. It found that *E-bay* write thousands of email subject lines in minutes for the billions of products it sells. It deployed an AI solution called *Phrasee* using natural language generation and deep learning to do Facebook ads, push messages to potential customers, making its creative staff to concentrate more or tasks that require more important creative skills.

In journalism, AI is being deployed to source, report, edit and distribute news and features. A study by knightfoundation.org set out to find out how news organizations in London have been using artificial intelligence, machine learning and other algorithms. (knightfoundation.org, 2021). The organization collected 130 projects focused primarily on projects done over three years. Almost half of the projects surveyed used AI for “augmenting reporting capacity” by helping to detect breaking news events and sourcing news stories, such as scraping Covid-

19 data from government websites. It also found that AI was massively used in “reducing variable costs”, i.e. is used in process of transcribing images and videos, generating stories, digitizing news organizations’ archives and in analyzing audience responses. For example, the Algorithm KPCC/LAist was used for sorting thousands of Covid-19 questions into manageable buckets. The study found also that from newsgathering to product development to subscriber acquisition and retention, newsroom have used AI across the entire new production process. However, the study revealed that AI was used mainly by the larger news organizations, but nevertheless recommended that “the need for AI for local newsroom is equally, not more urgent.” (knightfoundation.org, 2021).

### **Theoretical Framework**

The Diffusion of Innovation Theory (DOI) offers theoretical foundations for this investigation. The theory was developed by in the 1960s and it remains one of the most popular theories in the area of innovation for human development. (Korpelainen, 2011). This theory has been used successfully in many fields including communication, agriculture, public health, criminal justice, social work, and marketing, perhaps most successfully in public health. (Baran & Davis, 2010).

Diffusion of Innovation (DOI) explains how over time, an idea or product gains momentum and diffuses (or spreads) through a specific population or social system. According to Rogers, “adoption” occurs when someone puts up a new action or attitude different from the one he or she hitherto had been putting. It could be in making a purchase decision or using a new communication device or trying out a new drug. Basically, this involves a process in which people learn and respond to a new way of doing something. (LaMorte, 2016).

Diffusion was conceptualized by Rogers as a social process that occurs among people in response to learning about an innovator or/and an innovation. He notes that people respond differently in terms of how they accept or resist innovations but was able to group them in terms of their responses in five categories: *innovators*, *early adopters*, *early majority*, *majority* and *laggards*. He postulated that the majority of the general population tends to fall in the middle categories.

*Innovators* - are people who are eager to try the new idea or instrument. They are characteristically risk-takers and are fascinated by new ways of doing things. They are naturally venturesome and are thus predisposed to new ideas. That explains why they do not need so much persuasion to try out a new idea.

*Early Adopters* -. are willing to try out new ways of doing things but may not be so aggressive about it. Like the innovators, they are already predisposed to change but have not yet taken a decision. They enjoy leadership roles and embrace change opportunities. Most opinion leaders are early adopters. They are willing to embrace change but not-in-a-hurry.

*Early Majority* – are want to see evidence that the innovation will work before they adopt heavily-hence are typically susceptible to influences of peer pressure: Their appetite for risk is low. Strategies to appeal to this population include success stories and evidence of the innovation's effectiveness. Early majority wait in the wings to see the outcome of the innovation.

*Late Majority* – are the skeptics: they will only adopt an innovation after it has been tried by the majority. This category of people are not attracted to new ideas, and would only accept them on after being fully convinced that it is the best way to go.

*Laggards* - are people who are very skeptical of innovation. They are difficult to persuade. Often, they begin to show interest in new things when confronted with hard data, fear appeals and sometime threats, gifts, and peer pressure from people in the other adopter groups.

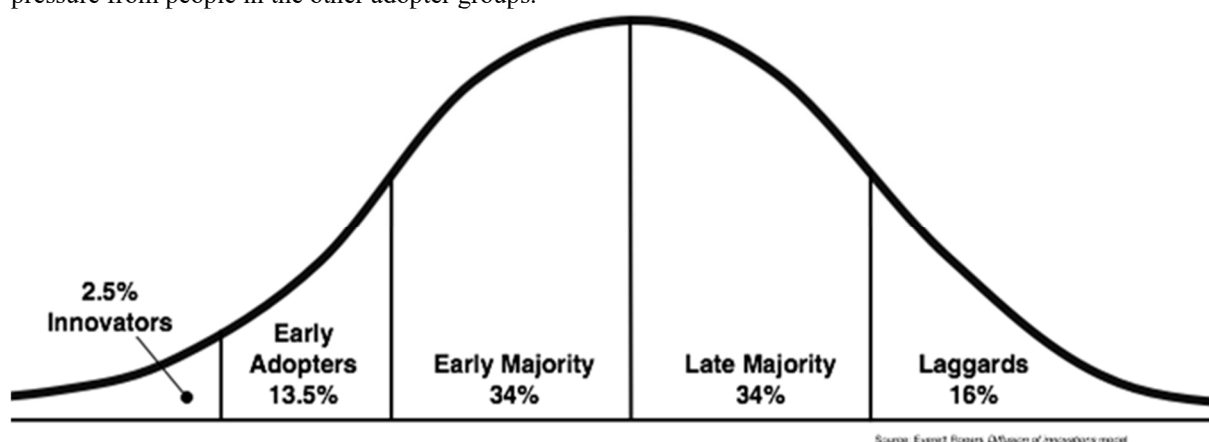


Figure 1: The five stages in the Diffusion of Innovation (Source: Everett Rogers, 2003)

Rogers further identified five main factors that influence adoption of an innovation, and each of these factors is at play to a different extent in the five adopter categories, and these were applied in investigating how AI is being adopted in news management.

1. **Relative Advantage** - The degree to which an innovation is seen as better than the idea, program, or product it replaces.
2. **Compatibility** - How consistent the innovation is with the values, experiences, and needs of the potential adopters.
3. **Complexity** - How difficult the innovation is to understand and/or use.
4. **Triability** - The extent to which the innovation can be tested or experimented with before a commitment to adopt is made.
5. **Observability** - The extent to which the innovation provides tangible results.

Below is a framing of AI conceptually into News management in Nigeria:

<b>ADOPTER CATEGORIES</b>	<b>INDUSTRY SCENARIO PLAY</b>
Innovators	Editors deploy AI to source and process news. They use latest drones to take pictures during riots, kidnaps and election processes in remote locations for instance; they use AI software to develop edit stories and track readership profiles.
Early Adopters	Editors believe AI is necessary and starts the process of deploying it through training (knowledge acquisition). They already use editing software to process stories written by their reporters, and source trending stories, etc.
Early Majority	The management/editors believe AI is necessary and starts the process of deploying it through training (knowledge acquisition) but these efforts are at rudimentary stages. The management believes AI is good but not something to rush at.
Later Majority	The management in this stage believes that AI is not necessary at this time. It is better to wait and see those who have adopted AI are performing before jumping into such investments, especially with dwindling market shares.
Laggards	The management does not see AI as important; hence not a priority.
<b>Influencer categories for adoption of AI</b>	<b>News management scenario</b>
Relative advantage	AI is cheaper, faster, and more efficient relative to humans performing the same task.
Compatibility	Print media houses in Nigeria have not fully digitized their operations and this might make adoption of AI difficult.
Complexity	Lack of infrastructure such as regular electricity makes use of AI very complex
Triability	Management of news media seem to lack the necessary will to try out AI at levels comparable to their counterparts in developed countries.
Observability	AI will provide stunningly effective results in boosting readership and advertisers especially for the online products of news publishers.

### Methods and Materials

This study employs cross-sectional survey research design for the purpose of obtaining required information within diffusion of innovation theoretical framework, for the inferential analysis. The researchers also conducted in-depth interviews with 18 of the 36 editors who participated in the study, to give perspective to the findings. The use of survey research design has been recommended by positivist researchers for study that involves collection of quantitative (or objective) information directly from the observations under study (Creswell, 2014). Also, recent evidence (such as Saka & Adeyanju, 2022; Saka & Akinde, 2022a) have suggested that survey research design is a plausible strategy for assessing relationship between two economic variables in a field survey to arrive at a valid generalisation about a given population. The population of this study is considered as the total number of newspaper outlets in Nigeria. However, the population is confined to only Lagos newspapers with both offline and online presence. At present, there are eighteen (18) major newspapers organizations in Lagos that have both online and offline platforms (Nigerian Finder, 2022 – 12 newspapers; Finelib, 2022 – 6 more newspapers). The sample frame (population) of the study is provided in Table 1 as:

**Table 1: List of Newspapers Outlets in Lagos State Nigeria with Offline and Online Presence**

S/N	Newspaper	Source
1.	Tell Magazine	Nigerianfinder.com
2.	The Sun	✓
3.	PM News	✓
4.	Naija Newspaper	✓
5.	New Telegraph	✓
6.	The Authority Newspaper	✓
7.	Daily Times	✓
8.	Complete Sports	✓
9.	National Daily Newspaper	✓
10.	The People’s Daily	✓
11.	The Union	✓
12.	ThisDay Live	✓
13.	Vanguard	Finelib.com
14.	Guardian	✓
15.	National Mirror	✓
16.	The Nation	✓
17.	Independent Newspaper	✓
18.	Cable Newspaper	✓

**Source: Authors’ Compilation (2022)**

In this study, Editor-in-Chief and Editor represent a newspaper. Therefore, the final population of the study consists of 36 editors of all newspapers in Lagos. The choice of Editor-in-Chief and Executive Editor is informed by professional experience garnered by these editors in news process and management on behalf of their principals, newspaper organisations. More importantly, these editors significantly help to manage editorial policies and content production that determine the adoption of artificial intelligence. The study applied a sample size determination formula recommended by Krejcie and Morgan (1970) for a known population to determine an appropriate sample size for the study. The sample size formula by Krejcie and Morgan (1970) as previously employed in Saka and Akinde (2022b); Saka and Fatogun (2021); Saka (2021); Amusa and Saka (2017) is stated as follows:

$$S = \frac{X^2 NP(1-P)}{d^2 (N-1)+X^2 P(1-P)}$$

Where s = sample size;  $X^2$  = table value of chi-square at 1 degree of freedom for desired confidence level (0.95); N = population size (18); and P = population proportion (0.5). The result yields a sample size of 17 newspapers outlets.

In terms of sample unit selection, the study employed a simple random sampling technique to ensure that every newspaper in Lagos has equal chance of representation. In doing this, the study used lottery design by assigning unique number to each of the newspapers outlets then picked at random (1, 2, 3...18) from a pool of numbers representing all the newspapers organisations. From randomly sampled 17 newspapers outlets in Table 1, one Editor-in-Chief and one Executive Editor were selected thereby making a final sample of 34 respondents. Subsequently, a well-structured questionnaire was administered among the randomly sampled 34 respondents. The questionnaire contains information on the attitude of editors (newspapers) toward the use of artificial intelligence in the management of news and most important steps required to integrate artificial intelligence into news management process.

Furthermore, the study developed two probit models to achieve the study objectives. The first model explains familiarity (attitude) of editors about the use of artificial intelligence in news management while the second probit model explains steps required to integrate artificial intelligence into news management process. The choice of probit models in this study is informed by the nature of the dependent variable (decision to adopt artificial intelligence in news management or not) of the study which is categorical or binary. The dependent variable is coded as “1” if a newspaper adopts artificial intelligence in news management process or “0” if a newspaper refuses to adopt artificial intelligence.

The probit models developed were based on model adapted from Saka and Akinde (2022b) which has its foundation from Katchova (2013) and stated as:

$$F(X'\beta) = \Phi(X'\beta) = \int_{-\infty}^{X'\beta} \phi(z)\delta z \dots \dots (equation 1) (Katchova, 2013; Saka \& Akinde, 2022b)$$

Where;  $f$  = function;  $\Phi$  = cumulative distributive function (cdf);  $X$ = explanatory variable;  $\beta$  = coefficient of explanatory variable;

Equation 1 was modified to incorporate the study explanatory variable in equation 2 as:

$$F(ATT'\beta) = \Phi(ATT'\beta) = \int_{-\infty}^{ATT'\beta} \Phi(z)\delta z \dots \dots (equation 2)$$

Where,  $ATT$  = Attitude toward the deployment of Artificial Intelligence

Equation 2 is adjusted to probability-based (probit) model in equation 3 as:

$$\Pr(AIN = 1|ATT) = \Phi(ATT\beta) \dots \dots (equation 3)$$

Where:  $\Pr$  = probability;  $AIN$  (Artificial Intelligence)

The study takes into consideration the possible occurrence of random events (random variable) and that brings additional adjustment to equation 3 as:

$$AIN^* = ATT'\beta + \varepsilon \dots \dots (equation 4)$$

Where;  $\varepsilon$  (being error term)  $\sim N(0, 1)$ . Then  $AIN$  can be viewed as an indicator for whether this latent variable is positive in equation 5 as:

$$AIN = 1\{AIN^* > 0\} = \int_0^{1 \text{ if } AIN^*} -\varepsilon < \sum_{i=1}^n ATT'\beta_j, \dots \dots (equation 5)$$

Where;  $\sum_{i=1}^n ATT$  = summation of number of  $ATT$  as independent variable ranging from  $n = 1, 2$ . The independent variable has 2 components (PRE and KNA). PRE = Preparedness; KNA = Knowledge Adequacy.

By extension, equation 5 is expanded into equation 6 as:

$$AIN = 1\{AIN^* > 0\} = \int_0^{1 \text{ if } AIN^*} -\varepsilon < \beta_1PRE + \beta_2KNA \dots \dots (eqtn. 6)(Model 1)$$

$$AIN = 1\{AIN^* > 0\} = \int_0^{1 \text{ if } AIN^*} -\varepsilon < \beta_3TRA + \beta_4FUN + \beta_5PUC \dots \dots (eqtn. 7)(Model 2)$$

From Model 2, TRA = Training; FUN = Funding; PUC = Publisher's Commitment

The two probit models in equations 6 and 7 were analyzed through Maximum Likelihood Estimation (MLE) method in STATA 12 as statistical software at 5% level of significance.

## Presentation, Interpretation and Discussion of Results

### Presentation of Results

This sub-section provides the estimation outcomes of probit regression and conditional marginal effects analyses of specified Model 1 and Model 2 as contained in the methodology section. Maximum Likelihood Estimation (MLE) method was employed to perform the two analyses. The results are presented in Table 2 and Table 3.



**Table 2: Model 1 Estimation Results (Probit Regression and Conditional Marginal Effects Analyses)**

Probit Regression						
Number of observations = 32						
LR chi2(2) = 1.62						
Prob > chi2 = 0.0008						
Log likelihood = -17.182241 Pseudo R2 = 0.0452						
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AIN	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
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PRE	.1852012	.177685	1.04	0.297	-.1630549	.5334573
KNA	.1463574	.1945807	0.75	0.452	-.5277285	.2350138
_cons	.8428422	.7440445	1.13	0.257	-2.301143	.6154582
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Conditional Marginal Effects						
Model VCE : OIM						
Expression : Pr(AIN), predict()						
dy/dx w.r.t. : PRE KNA						
at : PRE = 2.8125 (mean)						
KNA = 2.65625 (mean)						
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	Delta-method					
	dy/dx	Std. Err.	z	P> z	[95% Conf. Interval]	
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PRE	.0573939	.0544722	1.05	0.292	-.0493697	.1641575
KNA	.0453562	.0599522	0.76	0.449	-.1628603	.0721479
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Source: STATA 12 Outputs (2022)

**Table 3: Model 2 Estimation Results (Probit Regression and Conditional Marginal Effects Analyses)**

Probit Regression							
Number of observation = 32							
LR chi2(3) = 4.77							
Prob > chi2 = 0.0093							
Log likelihood = -15.608998 Pseudo R2 = 0.1326							
AIN	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]		
TRA	.4496791	.2203354	2.04	0.041	.8815286	.0178296	
FUN	.0846213	.2132591	0.40	0.692	.333359	.5026015	
PUC	.3010825	.2410895	1.25	0.212	.1714442	.7736092	
_cons	.3931654	.9247881	0.43	0.671	2.205717	1.419386	
Conditional Marginal Effects							
Model VCE : OIM							
Expression : Pr(AIN), predict()							
dy/dx w.r.t. : TRA FUN PUC							
at : TRA = 3.1875 (mean)							
FUN = 2.875 (mean)							
PUC = 2.6875 (mean)							
	Delta-method				[95% Conf. Interval]		
	dy/dx	Std. Err.	z	P> z			
TRA	.1329538	.0638713	2.08	0.037	.2581392	.0077684	
FUN	.0250194	.0628027	0.40	0.690	.0980716	.1481105	
PUC	.0890192	.0699287	1.27	0.203	.0480386	.226077	

Source: STATA Outputs (2022)

### Interpretation and Discussion of Results

The information in Table 2 illustrates the estimation outcomes of probit regression and Conditional Marginal Effects (henceforth, *CMEs*) analyses of model 1 in equation 6 of the model specification. Out of total 34 questionnaires administered, only 32 were returned and filled appropriately by the respondents who are the Editors-in-Chief and Executive Editors of sampled newspapers. The retrieved questionnaires represent 94.11% retrieval rate of total administered questionnaires. Interestingly, model 1 (probit regression) was found adequate and statistically fit ( $Prob > chi2 = 0.0008$ ) via the study obtained data to explain the attitude of Nigerian newspaper about the use of artificial intelligence in their news management process. From model 1 probit regression, increase in the level of preparation for adoption of effective technologies increases the likelihood that Nigerian newspapers will use artificial intelligence in the news management process. Similarly, increased knowledge adequacy and skills will increase the probability of the use of artificial intelligence in news management process by Nigerian newspaper outlets particularly those that have both offline and online presence.

With information via *CMEs*, an increase in the level of preparation for adoption of efficient technologies is more likely to increase the use of artificial intelligence by Nigerian newspapers in news management process by 5.7% ( $PRE: dy/dx = .05739 \times 100$ ). In the same manner, an increase in the level of knowledge and skills adequacy in artificial intelligence has high likelihood to increase the use of artificial intelligence in news management process by 4.5% (*that is, KNA:  $dy/dx = 0.04535 \times 100$* ). However, from the results obtained in probit regression and *CMEs*, both level of preparation for and knowledge adequacy level of artificial intelligence by Nigerian newspapers outlets are statistically insignificant ( $PRE: p\text{-value} = 0.29$ ;  $KNA: p\text{-value} = 0.45$ ) to predict the adoption or the use of artificial intelligence in news management process in Nigeria. These results show lack of familiarity with artificial intelligence by Nigerian newspapers media outlets.

In Table 3, estimation results of probit regression and *CMEs* were shown. The model 2 probit model was



found statistically significant ( $Prob > \chi^2 = 0.0093$ ) and best fitted for the study data to explain factors that determine possible integration of artificial intelligence into the news management process of Nigerian print and online newspapers. From the probit regression estimations, training of staff (*TRA*), funding (*FUN*) of news processing technology, and publisher commitment (*PUC*) to the use of advanced technology such as *AI* are important factors that have positive implications to the deployment or integration of artificial intelligence into the news management process of newspapers media outlets in Nigeria. In term of *CMEs* analysis, an increase in the level of training of newspapers editors in Nigeria on *AI* training is more likely to increase the probability of integrating artificial intelligence into their news management process by 13.30% (*TRA*:  $dy/dx = .13295$ ).

Further, the *CMEs* analysis shows that an increase in funding of investment in artificial intelligence equipments by newspapers agencies in Nigeria has high likelihood to increase the integration of artificial intelligence into news management processes of the newspapers companies by 2.5% (*FUN*:  $dy/dx = .0250$ ). Similarly, an increase in the publisher commitment toward the use of *AI* technology is more associated with high probability of increasing integration of artificial intelligence into the news management process of Nigerian newspapers media outlets by 8.9% (*PUC*:  $dy/dx = .0890$ ). Despite the high likelihood that *AI* technology investment funding and publisher commitment facilitate increased integration of artificial intelligence into news management process these factors were found statistically insignificant (*FUN*:  $p\text{-value} = 0.69$ ; *PUC*:  $p\text{-value} = 0.20$ ) within Nigeria context. But rather training of editors on the use of *AI* is observed to be the only significant factor (*TRA*:  $p\text{-value} = 0.037$ ) that explains the medium through which artificial intelligence solutions could be integrated into the news management process of Nigerian newspapers outlets. The results obtained from this study are consistent with previous findings by de-Lima-Santos and Mesquita (2021b); Krumsvik *et al.* (2019); Paulussen (2016); de-Lima-Santos and Salaverria (2020).

The editors consider the cost of acquiring equipment and materials of use of *AI* for news production very high. They however believe *AI* would lead to faster news management process.

Data generated from the interviews indicate that most of the editors consider the attitude of the publisher to the application of *AI* as the main problem facing the application of *AI* to news management. One of the editors succinctly explained:

My publisher does not see any reason why he should invest money in *AI*. Even for online news, he is not enthusiastic to invest in this area. His reason is that it will not bring in the needed income; so why waste money? But I assume he thinks that way because he is not familiar what *AI* can do. He does not consider the fact that if I get and deploy the right drone for instance, we can cover activities of kidnappers from far away and this would eventually boost copy sales. Currently, we have six Rewrite Specialists. One re-write software can do the task of those six. Unless he changes his perception of *AI*, we won't get better in that area.

## CONCLUSION

This study reveals that most editors of newspapers in Lagos, the media hub of Nigeria, are not prepared for the deployment of Artificial Intelligence in their news operations. Although they consider *AI* application in news gathering and reporting necessary, they do not think the technology would be applied soon in their operations because they think such is not a top consideration for them. This suggests that the preparedness of Nigerian news organizations for Artificial Intelligence in the management of news is poor. However, the news managers studied are willing to integrate *AI* into their news management process because they think the deployment of *AI* would lead to cost efficiency and faster production process.

This investigation implies that most of the news organizations were in the categories of "Late Adopters" and "Laggards". They are in the "trialability" and "observational" stages in Rogers' Diffusion of Innovation ladder.

Solutions to the challenges being faced in the integration of *AI* in news management in Nigeria include organization of seminars by professional bodies for publishers and editors for them to understand the critical role *AI* will play in modern journalism. Although fears that introduction of *AI* will worsen the gloomy employment prospects of fresh journalism graduates may be genuine, experience has shown that *AI* tends to create new jobs as it replaces old jobs. If carefully introduced, therefore, *AI* would not lead to job losses.

The management of news organizations needs to step up efforts to move up the innovation ladder – especially for their online operations. "Trial" is critical in the adoption of innovation process. Unless editors see *AI*-at-work in the newsroom, they may not fully comprehend the importance of the phenomena. The Nigeria Union of Journalists should urgently coordinate trials or demonstrations in the area of *AI* application in news management as strategy to prime-up adoption of innovation of *AI* to news operations.

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