Knowledge and Use of Data Driven Journalism Among Media Reporters in Minna, Niger State. Nigeria

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Abstract

This paper examined Journalists in Minna knowledge of data driven journalism, the extent of their use, the various tools used and the challenges associated with their use. Anchored on the technological determinism theory and media ecology theory, the paper used survey research method with questionnaire and interview as instrument to generate data from 262 respondents who are registered journalists in the State. Findings show that the knowledge base of data driven journalism among journalists in Minna is very low. Almost all the journalist contacted has never attempted to use it in practice. Further findings reveal that the lack of training and necessary skills in the use of the software for data mining are some of the challenges limiting their capacity to use data driven journalism in their reportage. They expressed phobia for the mathematical, numerical and scientific nature of data journalism because they are more familiar with the traditional method of news gathering and reporting and are not ready to accept the reality of the new trend in contemporary journalistic reporting. The paper recommends serious training for journalists on the nuances of data driven journalism.
Keywords" Big data, data journalism data query*, text mining, data mining

Introduction

The new media age has thrown up a number of opportunities and challenges to journalism. While media technologies have made news gathering and dissemination possible, it has also open a vista of opportunities for journalists to query social media users comments, assess number of users of a particular platform, get public reaction to an issue on the new media. It is also possible to get concrete and verifiable evidence on any issue of interest on the web. This is because the era of the new media is an age of big data. Big data according to Lewis & Westlund (2015) is a social, cultural and technological phenomenon which involves a complex amalgamation of digital abundance, emerging analytic techniques, mythology about data driven insight and growing critique about the overall influence of big data practices for democracy and society. Similarly, this suggests that big data concerns itself with digital information storage and retrieval techniques and its implications for different aspect of social life. With the advent of the social media and citizens driven journalism, journalism tends towards fake news, unanimous sources and uncertainty. Data driven journalism is a remonstrance against fake news and unprofessional news writing. It is the practice that helps journalist with social science research skills and digital literary skills to create and analyze stories from existing issues to show trend and predict the likely impact.

Bradshaw (2013) sees data driven journalism as the modern means of news processing and dissemination which has brought a new dimension to reporting where facts, figures, infographics, videographics, pictures, demographics and psychographics are creatively retrieved

and processed to serve as data for effective and credible reporting. In other words, it is possible to download files on any issue from the web and write meaningful report about them on such issues. Lechenet (2014) adds that our personal lives are recorded in huge databases.

The recent probe into *Data Analytics i*n the United Kingdom over its manipulations of voters in the United States and Nigeria in the 2016 and 2015 general elections suggest the value of data in media reportage of issues and the sort of agenda given to an issue. With the rate at which information flows on the web, knowledge of data driven journalism ought to give the journalist an ample opportunity to go beyond episodic event into big data to unravel hidden issues that have implications for the greater number of people in the society. A journalist can only do this, when he or she has the requisite knowledge of data journalism and its application. The use of big data in media enquiry can be traced to the pioneering work of Lechenet (2014) who traced his pioneering effort to the late 1960s when he laid emphasis on a new generation of Journalists that know how to find, evaluate and analyze information. It gained an appreciable level of cognizance at the dawn of the 21st Century.

The basic focus is on how people us information, mobile connectedness and use, data sharing, social media use and the new media in general. Zook, Barocas, Boyd, Crowford, Keller & Gangadharan. (2017). Given the power of big data in modern journalism, one would think that journalists in Nigeria, particularly those in Minna would take advantage of it. Where they have the knowledge and skills necessary for the practice data driven journalism, the result will likely be robust journalism. This study, therefore, assesses Journalist in Minna Knowledge and use of data driven journalism in their day to day practice.

Statement of the problem

The benefit of big data to modern journalism is that it has helped in providing empirical data for robust journalism practice. As Zook et al (2017) observes "the digital era has also afforded researchers access to new sources of digital data in unprecedented ways. New methods of codification of experimental design, the development of systematic sampling and survey, advent of multivariate statistical analysis as well as the development of searchable compilations of media content and video recordings now offer communication researchers opportunities to work with very large datasets, have new insights for thinking about existing questions, understand trends, behaviors and actions in a way that has not been previously possible".

From these huge benefits of the knowledge and use of big data, it is likely that journalists that apply it in practice would stand better in their reportage. Where the knowledge of data literacy is high, it is possible to analyze and compare budgets, policies and even reports from databases they have access to. On the other hand, it is not certain the level of data literacy among reporters in Minna and their use of data driven journalism tools in practice, hence, is against this back drop that this paper sought to find out the level of knowledge and use of data driven journalism in Minna, whereby, findings from the study will be used to set further pace on how to utilize the great benefits of this relatively new area of journalism practice in other to enhance better, precise and reliable reportage.

. **Objective of the Study**

The objectives of the study were to:

1. Find out the level of knowledge reporters in Minna have in data driven journalism
2. Determine the extent to which Journalists in Minna use data driven journalism
3. Ascertain the various tools reporters in Minna use in data journalism
4. Find out the challenges that limit the capacity of reporters in Minna to use data driven journalism

Review of Related Literature

Digitization of communication has given birth to a new trend in journalism called data journalism. It is a relatively new discipline based on innovation in information technology. At the heart of digital communication is the notion of big data. Big data according to Lewis (2015) is a movement which has been associated with the analysis of large social networks, automated data aggregation and mining, web and mobile analytics, visualization of large datasets, sentiment analysis and computer-assisted content analysis of very large datasets. Thus, big data is a trend in communication research which journalism has leverage on.

It is from this perspective Bradshaw (2013:3) defines data journalism as "using methods and digital tools to gather, filter and visualize stories based on data". To Meredith Broussard (nd) in Alexander (2015) data journalism is the practice of finding stories in numbers and using numbers to tell stories," Furthermore, there are different uses of data journalism such as algorithm, text mining, data mining, social analytics, sentiment analysis, topic modeling, viblogs, microblogs. Lechenet (2014) Suggested the following ways of practicing data journalism, the collection of already published information commonly called open-source intelligence, web

scrapping which involves the use of different software to download information, crowd sourcing information from people who have firsthand information about it. Creating data bases from scratch and social network analysis which means getting the demographic and psychographic data of respondents from the social media. By its nature, data journalism has three basic features; volume, velocity and variety. The beauty of data journalism lies in the verification of the data sources and its capacity of being reproduced by different sets of researchers.

To Turo & Heikki (2015), data journalism provides avenue for real time information processing and presentation. Data journalism provides avenues for a better understanding of societal trends. It serves as a new platform to interrogate data which hitherto where too voluminous to be analyzed. Data journalism creates avenue for data literacy and knowledge transfer. It serves to provide agenda on critical issues which where hitherto neglected.

In time past when information was scarce, most of journalists' efforts were devoted to hunting and gathering of information. Now that information is abundant, processing is more important. When journalists combine new technology with narrative skills, they can deliver context, clarity and a better understanding of the world around us. Alexander (2015). Data savvy journalists can now bridge the gap between statisticians, Media reporters are needed more than ever today to curate, verify, analyze and synthetize the wash of data.

Within this context, data journalism has profound importance for both our society and the journalism profession at large. .Data journalism according to Cinzia, Yoann & Artur (2015) includes three dimensions and requires three different types of journalism skills: computer assisted reporting, news applications development and data visualization. News reporters with these skills are able to discover interesting and relevant findings analyzing data with the help of information technology tools.

Liabwuk & Pachi (2017) carried out a study of Journalists in Kaduna utilization of data for data journalism practice, result from their study, showed a strong level of agreement amongst journalists on their knowledge and use of data in journalism practice. The study called for training of journalists to make for effective practice. In another study by Alexander (2015) on the art and science of data-driven journalism, he opined that just as there is a gap between available talent and the demand created by big data, there is a data science skill gap in journalism.

He maintained that rapid expanding troves of data are useless without the skills to analyze them. He opined that whatever the context, focusing too much on tech skills could

exclude some of the best candidate for the job, but that, there will be need to build capacity in these areas through training, mentorship, numeracy, competition and recruiting. He concluded that this will create a good pathway to the profession. Similarly, both studies are relevant to this paper as this study seek to know the knowledge level of media reporters in Minna about this new trend in journalism practice. The result from this study would go a long way to prepare journalist in Minna on the required skills, capacity and training to meet up with the new trend.

Theoretical Framework

This study is anchored on the technological determinism theory and the media ecology theory. Technological determinism\ theory emanated from Marshall McLuhan in 1964. The basic premise of the theory is that the media are the extensions of the human body and that the media do not only alter the environment but the very message they convey. The media bring new perceptual habits and ways of doing things while their technologies create new environments. The theory states that technology, especially the media, decisively shape how individuals think, feel and act and how societies organize themselves and operate. According to Asemah (2011), the medium determines the content of communication. The medium has the power to manipulate our perceptions of our environment. As opposed to Karl Marx's theory of economic determinism where production makes changes in the history,

McLuhan's theory of technological determinism says that changes in modes of communication evolved from human experience. McLuhan examined the ways technology has shaped human society and experience and came to the conclusion, that technology creates changes in human society as we communicate. He observed that when the printing press was invented, human moved from writing on papyrus to printed materials. Similarly, when the telephone and telegraph were invented, the message runner was replaced with these technologies

In relations to this paper, the advent of new form of information storage and processing has given birth to a new form of journalism, thereby altering the old way of news gathering and analysis. Thus, journalism is moving from just reporting episodic event to interrogative recorded events on the web.

Media ecology theory was propounded by Neil Postman in the 1970s. The basic thrust of the theory is that machines have in many ways shaped and changed the media environment from the physical plane to the virtual space. The result is that these changes shape the journalists work environment and perception.

Liabwuk & Pachi (2017) contend that the engagement of digi textual practices in all spheres of human endeavor has increased with technological advancement both in software programmes and hardware technology.

According to him "the internet which serves as the media environment and the data software which serve as tools for processing information and the audience which are found in the virtual space all make use of internet to source for news". He argued that the ecology or internet environment has made the audience and journalists to operate at a hyper level which was not the case in the traditional or conventional era of news sourcing and dissemination. The relevance of this theory to the paper lies in the fact that, modern journalism is driven by data. Only journalists who are familiar with the tools and skills necessary to operate data bases can practice data journalism.

Research Methodology

The research design employed in this study was survey. Survey method is useful in collecting primary data involving large human samples and their cumulative views on a particular matter. Asemah, Gujbawu, Ekhareafo and Okpanachi (2012) opine that the aim of the survey is to find out why people behave in a particular way and what their behavior would be under a given condition. They noted that the survey design makes it possible to study the perception, opinion of a sample and variables as they are without the researcher making any attempt to control or manipulate them.

The population of Journalists in Minna as at 5th May, 2018 stood at 277. Of these, there were 189 males and 88 females with varying academic degrees. From the demographic data obtained, 54 were single, 191 were married, widowed 15, separated 9 and divorced 8. Furthermore because the population for the study is relatively small, the researchers adopted the entire 277 registered journalists as population for the study. However, only 262 journalists responded to the questionnaire.

The researchers used the accidental sampling technique in selecting journalists for the study. This is because the NUJ house popularly known as IBB Pen house in Minna is a meeting point for all journalists from various media houses and correspondents chapel in the City. It is the most suitable place where the researchers can get the needed respondents for the research exercise. Interestingly the survey coincided with the world press freedom day, hence the

researchers reached out to a very good number of registered members of the Union present at the event.

A 22-item questionnaire was administered on respondents to generate relevant data for the study. The questionnaire was analyzed using cross tabulation with frequency tables and simple percentages. This format made the presentation clearer and the calculation of percentage scores much more feasible. The analysis of the result is presented below.

In addition, qualitative data were obtained using in-depth interview as method of data collection for research objective four of the study which sought to find out the challenges that limit the capacity of reporters in Minna to use data driven journalism. The interview guide contained basic questions derived from the objectives of the study, while thematic explanation of the interview was adopted using the Yin explanation building to analyze data from the interview. A few individuals who were willing to speak on the topic were purposively selected for the interview.

Data presentation and Analysis

Table 1   Registered Journalists in Niger State

S/N	Media House	Frequency	Percentage
1	Newsline	32	11.55
2	Radio Niger	39	14.08
3	NSTV	19	6.86
4	NTA	17	6.19
5	Power Fm	16	5.78
6	Prestige Fm	28	10.11
7	Ministry of Information	64	23.10
8	Federal Information Resource Centre	14	5.05
9	Correspondents from other media house outside Minna represented in Niger State	48	17.33
Total		**277**	**100**

From the table above, it is glaring that majority of journalists in Minna were from Ministry of information, Radio Niger and Newsline newspaper respectively. Of all the 277 registered journalists in Minna only 262 journalists responded to the questionnaire.

Table 2 Respondents Level of Knowledge/Awareness of Data Driven Journalism, in Minna

Have you heard about data driven Journalism?	Freq.	%	Have you had any form of training/exposure about data journalism?	Freq.	%
Yes	3	1.15	Yes	1	0.4
No	259	98,85	No	261	99.6
Total	**262**	**100**	**Total**	**262**	**100**

A close look at table 2 above shows that almost all journalists in Minna had little or no knowledge about data driven journalism. Furthermore, a larger percentage (99.6%) of journalist had no form of formal training or exposure about data journalism. Only 1 out of the 3 respondents who indicated knowledge about data journalism had a form of training about it. Further information from the journalist showed that the exposure gotten was not as a result of formal training from the media organization where he work but through personal research and interest in the emerging field.

Table 3 Extent of Usage of Data Journalism by Reporters in Minna

Are you conversant with the use of Big data in reporting?	Freq.	%	Have often do you use Big Data in your report?	Freq.	%	Have you ever used any of the data software in reporting?	Freq.	
Yes	1	0.4	Occasionally	1	0.4	Yes	0	0
			Frequently	0	0		0	0
No	261	99.6	Not at all	259	99.6	No	262	100
Total	**262**	**100**	**Total**	**262**	**100**	**Total**	**262**	**100**

The second objective of the study was to determine the extent of usage of data journalism by reporters in Minna. Information from table 3 revealed that 99.6% of journalists in Minna are not conversant with the use of Big data in reporting. It is glaring from the table that, only 1 respondent occasionally use Big data in his reportage but none had mastered the use of data software in their reports as far as data driven journalism is concerned.

Furthermore, the result of this finding is in line with the media ecology theory used in this study which lies in the fact that, modern journalism is driven by data. Only journalists who are familiar with the tools and skills necessary to operate data bases can practice data journalism. Hence it is glaring that because a very large number of media reporters in Minna lack the

required knowledge of the software for data journalism hence their inability to adopt same in their reportage.

Table 4   **Tools/Techniques used in Data Driven Journalism**

Have you heard of Big Data tools like Import, Open refine, Data Cleaner, Handroop, Cloudera and MongroBD?	Freq	%	Have you come Across software For data mining, Analysis and Visualizing in your practice?	Freq	%	Which of the following data mining software are you conversant with?	Freq	%
Yes	1	0.4	Yes	1	0.4	ODA	0	0
						Word Star	0	0
						Text Mining	1	0.4
						Some of the above	0	0
No	261	99.6	No	259	99.6	None of the above	261	99.6
Total	**262**	**100**	**Total**	**262**	**100**	**Total**	**262**	**100**

The third objective of the study sought to ascertain the various data journalism tools and techniques used by reporters in Minna in their reportage. Information on the table shows that 99.6% of journalists in Minna do not use nor have an idea of the tools and techniques used in data journalism. Neither have they mastered the use of the software for data journalism.

As a matter of fact majority of the respondents frowned at the idea of data journalism, according to them, they are satisfied with the traditional method of news gathering and reporting. Most of them feared that the idea of data driven journalism is too scientific and may involve some level of mathematical technicality which is too scientific for their liking.

Challenges that limit the capacity of reporters in Minna to use data driven journalism

The fourth objective of the study sought to find out the challenges that limit the capacity of reporters in Minna to use data driven journalism. To generate concrete data for this research question, the researchers adopted the qualitative method with interview as instrument. The Yin's thematic analysis was used to analyze the information gotten from the interview conducted with selected few who were willing to speak on the issue.

Majority of the responses show that the challenges confronting journalists in Minna use of data journalism was due to lack of adequate knowledge and exposure to the new phenomenon

as most of the respondents were of the view that their media organizations have not keyed into it and the necessary training has not been organized for them to effectively apply it in their reports.

Discussion of Findings

The position of this paper lays on the premise that the advent of new form of information storage and processing has given birth to a new form of journalism called data driven journalism, thereby altering the old way of news gathering and analysis. Thus, journalism is moving from just reporting episodic event to interrogative recorded events on the web. Hence the researchers sought to find out knowledge and use of data driven journalism among media reporters in Minna, Niger State. The discussion is based on the four research objectives raised at the beginning of the study.

Findings from the study revealed that the knowledge base of journalists in Minna about data journalism is very low. Only 1.15% of journalists in Minna had knowledge about the relatively new trend. Majority of respondents lack knowledge about data journalism as clearly indicated in table 2. Amongst all the respondents, only one has knowledge on the software used for data mining, analyzing and visualizing.

Further interactions from respondents who indicated knowledge about data driven journalism show that those who had heard about journalism are not necessarily conversant with the use of the tools or techniques. Only one respondent had actually used some of the tools for data journalism

The import of this is that data journalism practice is yet to gain the necessary awareness, adoption and use amongst journalists in Minna. This may be based on the level of advancement in technology use and the expertise necessary for a digital driven media These findings in a way contradicts the media ecology theory by Neil Postman in the 1970s. The basic thrust of the theory is that machines have in many ways shaped and changed the media environment from the physical plane to the virtual space. The result is that these changes shape the journalists work environment and perception

This study argues that the changes which the media ecology theory talked about can only shape the journalists environment and perception if only media personnels who are conveners of this change are willing and able to make conscious effort to adapt to new technology of data journalism practice.

Further result from research objective three shows that 99.6% of journalists in Minna do not use nor have an idea of the tools and techniques used in data journalism. As a matter of fact majority of the respondents contacted during the survey frowned at the idea of data journalism, according to them, they are satisfied with the traditional method of news gathering and reporting. Most of them feared that the idea of data driven journalism is too scientific and may involve some level of mathematical technicality which is too scientific for their liking

In respect to the challenges that limit their capacity to use data journalism in their reportage as stated earlier, the study discovered that, these findings differ considerably from those of Liabwuk & Pachi (2017) study of Journalists in Kaduna utilization of data for data journalism practice, where they find a strong level of agreement amongst journalists on their knowledge and use of data in journalism practice. However, the challenges confronting Minna Journalists also find support with those in Kaduna who called for training of the journalists to make for effective practice.

Further information from the interviews revealed that, journalists are reluctant to imbibe this new form of journalism in practice because they are not willing to adopt data journalism in their reportage as they find it too complex to understand. If this be the case, then Alexander was right when he stated that "there is a gap between available talent and the demand created by big data, there is a data science gap skill gap in journalism". To him, "rapid expanding troves of data are useless without the skills to analyze them".

This study posit that the gap referred to by Alexander (2017) can only be bridged if journalists are equipped with necessary intensive training and tools and must be willing to learn and apply the skill in practice. It also agreed with the fact that when journalists combine new technology with narrative skills, they can deliver content, clarity and a better understanding of the world view around us as stipulated by Alexander in his work "the art and science of data driven journalism".

Conclusion

The research work focused on knowledge and use of data driven journalism among media reporters in Minna, Niger State. The objectives of the study, amongst others were to, find out the level of knowledge reporters in Minna have in data driven journalism, determine the extent to which journalists in Minna use data journalism, ascertain the various tools reporters in Minna use in data journalism and the challenges that limit their capacity to use data driven journalism.

From the findings, the study concluded that the knowledge base of data driven journalism among journalists in Minna is very low. Almost all the journalist contacted has never attempted to use it in

practice. They lack basic knowledge on the use and application of data driven journalism in their reportage. The lack of training and necessary skills in the use of the software for data mining are some of the challenges limiting their capacity to use data driven journalism in their reportage.

Recommendations

Based on the findings, the study recommends that:

1. Media proprietors in Minna should as a matter of urgency organize training on Big data research for reporters.

2. The necessary software for data driven journalism should be acquired and installed for media reporters to have hands on experience.

3. The Nigerian Union of Journalists should as a matter of urgency organize workshop in this new trend of journalism practice to enable reporters move with the new trend in journalism.

4. Media training institutions should introduce courses in this area, so that students who hope to practice can have adequate knowledge of the skills required before they venture into the profession.

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