



**ASSOCIATION OF
COMMUNICATION SCHOLARS
& PROFESSIONALS OF NIGERIA
BOOK SERIES**

Big Data and Cultural Transformation in Nigeria

Mohammed Auwal Umar

To cite this article:

Mohammed Auwal Umar (2024), Big Data and Cultural Transformation in Nigeria in Digital Communication And Nigeria's Transformation; Bridging the Technology, Policy and Citizenry Divide ACSPN Book Series 9, pp. 179— 194

Retrieved from <http://www.acspn.com.ng>

(Institutional or Subscribed access may be required)

Please note that this is an electronic, pre-print version of this article published by the Evan Brothers (Nigeria Publishers) Limited for Association of Communication Scholars & Professionals of Nigeria (ACSPN).

The ACSPN Book Series is exclusive to the Association of Communication Scholars & Professionals of Nigeria.

ISBN: **978-978-696-444-7**

Copyright ©2024

Editor and Contributors

Layout/Design: Ashroph De Grafico Ventures.

All rights reserved. No part of this book may be used or reproduced in any form or any electronic or mechanical means, including information storage and retrieval systems, without permission in writing from the publisher, except by reviewer who may quote brief passages in a review.

Chapter Eight



Big Data and Cultural Transformation in Nigeria

Mohammed Auwal Umar

Abstract

This study examines the potentials of big data in facilitating cultural transformation in Nigeria. Big Data has gained recognition overtime both as a concept and as a tool for facilitating transformative development strides in many countries but developing countries like Nigeria is still lagging in utilising big data for cultural transformation which could in turn engender national development. To this end, this study made contributions in identifying areas where big data can foster cultural transformation and challenges that could be encountered in big data utilisation in Nigeria. We contend that

big data can inspire Social Justice, promote diversity and inclusion, promote cultural education and learning, cultural sustainability and preservation and promote cultural competence in business. However, these can only be achieved if challenges such as technological limitations, data security and privacy, and data quality demand are earnestly addressed. The study concludes that data-driven policies, programmes and interventions in the cultural sector can help Nigeria harvest the abundant resources, social capital, and explore the available opportunities for national sustainable development. The study recommends that national, local, private and public institutions in the cultural sector should tap from the available data in Nigeria by investing in the verities of big data analysis software and associated hardware to continue to expand the potentials of the cultural sector.

Introduction

Big data is an old concept that describes massive, multi-layered, integrated and consolidated data sets having varied, and complex structures for analysis, and storage. The characteristic features of big data dates back to the 1960s and 70s but were coined in the 1990s. Since its coinage, it remained largely unpopular until the swift advancement in technology in the 21st Century (Flyverbom, Deibert, & Matten, 2019; Khan, 2014; Yaqoob, *et al.*, 2016). Advancement in technologies and their acceptance among people have made big data a central issue globally.

The unimaginable rapid technological advancements and increasing digitalisation have resulted in vast amounts of data from various sources (emails, social media apps, watching

videos, online shopping) generated daily. About, 328.77 million terabytes of data are getting created every day and it is ever-increasing (Gill Press, 2024). This data holds immense potential for gaining important insights and stimulating informed decision-making, including competition among organisations. For instance, the data generated by mega technological companies gives them an edge in gaining richer and deeper insights and getting an advantage over the competitors (Sagiroglu, & Sinanc, 2013). This suggests that big data has become a factor in national transformation.

Many countries and corporate organisations have realised the benefits of big data and are utilising it as a global phenomenon that is driving development across sectors, Nigeria inclusive (Web Manger, 2023; Singh, & El-Kassar, 2019; Ali, *et al.*, 2016; Kshetri, 2014). For instance, Nwanga (2014) demonstrates that Nigeria is leveraging big data for national security purposes. Nigeria is also leveraging big data to enhance decision making across public and private sectors, enhance business decisions, improve operational efficiency, driving innovation and economic growth among others.

One sector that affects the totality of human existence is the cultural sector and Nigeria is endowed in this regard. Rich cultural heritage and diversity in culture have their benefits in terms of national development (Akanle, 2012; Erhun, 2015). However, no sector irrespective of its strides in boosting national development has reached its peak, exhausted its space or has no room for further or novel transformation, better still has no twists or complexities in its bid to foster national development. The cultural sector in Nigeria is not immune from these.

Nigeria's cultural sector, as endowed and vibrant as it appears has its complexities and undoubtedly transformational desires

(Bassey, 2015; Ekpenyong, 2022). For instance, Ekpenyong (2022) states that Nigeria should embrace cultural change for transformation at the grassroots for national and global benefits. This suggests that there are still unoccupied transformative spaces in Nigeria's cultural sector especially concerning national growth and development. Considering the unimaginable potentials of the Big data phenomenon in national development or transformation and the nation's quest for sectoral transformation, this paper examines the possibilities of big data for cultural transformation in Nigeria. The study has two objectives: i) examine areas where Big data fosters/can foster cultural transformation in Nigeria and (ii) identify the challenges of big data for cultural transformation. To achieve this, the study employs a library research method and observation to examine secondary sources, identify potential areas and merge with observed tendencies in Nigeria.

Literature review

The concept of Big Data can be traced back to the advent of computers in the 1960s and 1970s to describe large and diverse data sets. Before then, data were usually collected, processed, analysed and stored manually but with the introduction of computers, the data analytical horizon expanded. To this end, data becomes more precious, central and crucial. Additionally, data collection exercises and aggregation continue to expand. Big data then came to be described as extremely large and diverse collections of structured, unstructured, and semi-structured data that continue to grow exponentially over time. Ylijoki, and Porras, (2016) state that there is no single acceptable definition of Big Data. Several scholars attempted to define the concept using different approaches, concepts and points of view (Al-Mekhlal, & Khwaja, 2019; De Mauro, Greco, & Grimaldi, 2016). Favaretto, et al., (2020) define Big Data as a concept

used to describe the “collection and aggregation of vast amounts of data, to a plethora of advanced digital techniques designed to reveal patterns related to human behaviour.” This definition accommodates not only the collection and aggregation of data but also the purpose of big data analytics. In this regard, Big Data does not provide the full advantage on its own without analytics. Beyond this, there is also a perspective that sees Big Data as a disruptive technology (Ylijoki, & Porras, (2016) that has widespread implications on society. Ylijoki and Porras further state that at the initial stage, big meant the size and all the sources recognized and referenced big data with the increasing volumes of data.

However, Laney (2001) offered a substantial improvement in defining big data with three essential dimensions or categories: *volume, velocity and variety*. In terms of Volume, big data obviously involves vast or large amounts of data. The scale of information in these datasets makes it impossible for conventional storage and management systems. For Velocity, it is about how fast new information is generated and processed to keep up with the pace of information. Variety is primarily about the data multiple formats from numerous sources, ranging from industrial devices, social media platforms, emails etc which can take the form text, audio, videos, pictures, sales data among others . These three dimensions or categories provide a useful way to think about big data and to easily envision the challenges of working with it.

The concept of Big Data is understood and used in this paper as an ingenious phenomenon that introduces significant prospects for societal transformation, especially in developing countries like Nigeria. For instance, Nigeria has generated large, structured, unstructured and extremely diverse data, thanks to its physical diversity, which is not fully utilised in

facilitating development, especially in the cultural sector (Tugbokorwei, 2008). Nevertheless, with the growing significance of big data in driving sectoral transformation, Nigeria has a lot to make from its rich cultural data for national development.

Cultural Transformation and National Development in Nigeria

Cultural transformation and national development have a multi-dimensional impact on each other. Each is determined as a requisite for achieving the other. However, a lot has been said about how authorities neglect the contributions of culture and cultural transformation to national development in Nigeria. Tugbokorwei (2008) states that Nigeria as a developing country fervently pursues multitrack development strides but seemingly prioritises science and technology as the only routes for the attainment of this dream. This neglects and excludes the contribution of other factors like culture and arts despite open statements made by people in government about the place of culture in the development of Nigeria. Sometimes such situations are created due to how the concept of national development is defined or the lack of corresponding will to the good definitions.

Tugbokorwei (2008) defines national development as the “positive progression in all its ramifications from one state to a better one of a group of people occupying a given territory and who share several things in common.” This definition is maximalist and all-inclusive because it sees the development from all ramifications including cultural transformation. Cultural transformation on the other hand entails changing, adjusting, adapting, modifying and enhancing people's practices (Du Toit, & Forlin, 2009).

Cultural transformation does not suggest manipulation, identity switch, unsustainability or abandonment of the entire cultural system. It rather entails the identification and transformation of practices, conceptions, ideas and values that do not adequately support the development of the society. In Nigeria, the identification of anti-development cultures has not been a difficult task but transforming them is the line that is yet to be straightened. However, all hope is not lost for Nigeria to continue to expand the search to prospects that can engender cultural transformation. Big Data holds these potentials for prospects regarding cultural transformation that can translate to national development in Nigeria.

Big Data and National Transformation

The centrality of data has a long recognition in the governance and development of nations. This is why the collection, analysis and utilisation of data are crucial and sensitive tasks. The sensitivity is not just about the data in itself but also the bearing it has on the generality of the development strides of nations. For instance, Big Data is central in the analysis, policy and decisions on national security and governance across many countries (Crampton, 2015; Klein, et al., 2016; Van Puyvelde, et al., 2017). Big Data also provides countless opportunities for national transformation (Andrienko, et al., 2021; Jarmin, & O'Hara, 2016; Pencheva, Esteve, & Mikhaylov, 2020), especially in the areas of cultural transformation, policy analysis and transformation of cities, attitude and behaviours of people. It is pertinent to state that national transformation owes a lot to cultural transformation because people make changes. If the people are not transformed, the nation cannot achieve realistic and measurable transformations. In this sense, national transformation is hinged upon cultural transformation that can be facilitated through big data analyses, which inherently hold patterns, meanings and directions that inform policy, practices

and decision-making towards national growth and development.

Challenges of Big Data and National Transformation

Generally, data-based governance is an obvious challenge in Nigeria. But, the challenge has its roots in the reliability of the data from its collection, analysis and utilisation. These and other challenges are drawn from the global experiences as expressed by Hilbert (2016) that challenges of big data for development include continuous unequal access, big data reliance on samples, lack of adequate training for specialists who are in direct implementation and the global shortage of experts. This has been re-echoed by Noormohammad, et al., (2010) who state that “use of Big Data applications in development project shows that adequate training for data specialists and managers is one of the main reasons for failure.”

Additionally, the global shortage of experts has disproportional negative effect on developing countries and the public sector disproportionately (Borne, 2013; Freedman Consulting, 2013). This shows that even on the global stage and in the general practice of Big Data, the challenges seem intense in developing countries. It can be deduced from these that the inadequate utilisation of Big Data for national development and transformation is captured in the submissions. It is only when these challenges are overcome at the higher level and local initiatives are proposed that Big Data can be fully integrated and utilised for national growth, development and transformation.

Big Data Fosters Cultural Transformation in Nigeria

Nigeria has abundant data sets, databases and data systems that have largely remained redundant and under-utilised. This

does not mean that there are no ways such data can be utilised for cultural transformation. Having collected, synthesised and examined available literature and observations made, the following are key areas Big Data can be used to foster cultural transformation in Nigeria:

- i. Diversity, Equity, and Inclusion:* Diversity in Nigeria is a capital resource that is most often used negatively. Nigeria can use big data to analyse the nitty-gritty of its diversity to identify areas that needs to be transformed, modified and adjusted. Analysing data on diversity metrics, bias, and inclusion can help the government and its institutions identify areas for improvement and develop data-driven strategies for promoting equity and inclusivity. Using a data-based approach can facilitate equity and inclusion for minority groups and marginalised communities.
- ii. Education and Learning:* Education as a transformational tool can be used to transform cultural and developmental strides in Nigeria. The education in Nigeria in itself is banking education. This largely excludes many people who only have traditional knowledge and traditional cultural expressions. Using databases in analysing patterns and directions of education and learning can help in transforming how Nigeria educates its citizens about culture and development. Big Data can enhance personalised learning, student outcomes, and educational resource allocation.
- iii. Art and Creative Expression:* Big Data can help connect between artists and their audience. Artists can also utilise data to understand where their expressions are most valuable and needed and channel them appropriately. Similarly, it can also inform decisions to introduce new art forms that can positively influence people towards cultural and transformative

development.

- iv. **Cultural Preservation and Sustainability:** Cultural sustainability is a big challenge in Nigeria due to a lack of documentation and preservation. A lot of cultural heritages are fast declining and without data, very limited can be done to promote sustainability and preservation. This is also an area where data can help preserve cultural heritage sites, artefacts, and historical records.
- v. **Inspire Social Justice and Activism:** there are many marginalised groups in Nigeria. Using data, government and private institutions can make interventions that would uplift such groups and integrate them into the national developmental structure and enhance their participation in cultural life. Data analysis can also support social justice movements by identifying trends, tracking progress, and optimizing advocacy strategies.
- vi. **Cultural Exchange and Diplomacy:** When cultures come together, three things take place. Cultural borrowing, cultural imposition and cultural exchange, and while imposition is relatively negative towards transformation, borrowing and exchange induce voluntary acceptance of cultural practices and values that can enhance individual lives and national development. Big Data can also facilitate cross-cultural understanding, language translation, and international collaborations.
- vii. **Promote Cultural Competence in Business:** There are many cultural businesses that are operated at the subsistence level. Such business can have mega contributions to national growth if they are adequately transformed. Data-driven insights can promote cultural competence in business, enhance market research, and inform economic development strategies at individual and institutional levels.

viii. Environmental Sustainability: Cultures are often determined by the environment and vice-versa. As such, cultural practices have bearings on the sustainability of the environment. The negative impact of cultural practices on the environment can be reduced by transforming the culture using available data. Data analysis can support environmental conservation, climate change research, and sustainable resource management.

Challenges of Big data for cultural transformation in Nigeria

As novel and beneficial as Big data is, harnessing it is usually accompanied with some challenges, which Nigeria would have to brace up to address, to make the most out of it. Some of the challenges are:

1. **Poor or inadequate Knowledge:** A lot of experts across sectors including the cultural sector are still not with the big data and its application, so there is bound to be failure in correctly utilising the big data.
2. **Technological limitation:** The soaring amount of the data often exceeds the management capability of the traditional database. It is always a huge challenge to build stable and extensible servers.
3. **Integrating data from multiple sources:** The data itself presents another challenge. There is a lot, but it is also diverse, considering Nigeria's rich and diverse culture because it can come from a variety of different sources. None of this data is structured the same but may have to be integrated and reconciled to gather necessary insights and create meaningful information from them. To address this challenge, experts use data integration software, ETL software, etc to map data sources into a common structure and combine them so they can

- generate accurate information, but human resource to do this has always stood as problem.
4. Challenges on how to interpret or understand the diverse and massive cultural diversity. For example, Big data analysis can be a solution or application that can adapt learning to improve, such as the combined use of deep learning methods to accelerate data analysis, given the cultural diversity of the nation, a lot of cultural affiliations may take a while to reach with such technologies for deep learning method.
 5. Data security and privacy: any organisation that handles sensitive important data, often become a target of hackers. Ensuring the information safety is a crucial issue in the era of big data. The increasing big data demands more for the physical safety of the data storage and information stored, resulting in higher requirements for backups and disaster recovery mechanisms.
 6. The data quality demand: Big data is not only to collect a large amount of data information but to process the collected data to offer the possibility of extracting valuable information. Analytics and machine learning processes that depend on big data to run also require clean and accurate data to generate valid insights and if the data is incomplete or not correct, the results will not be correct.

Conclusion and Recommendations

Big data hold diverse, pervasive and influential prospects to facilitate cultural exchange, inspire social justice and activism, education and learning, cultural and environmental sustainability in Nigeria. These prospects can also induce national growth, transformation and national development. Data-driven policies, programmes and interventions in the cultural sector can help Nigeria harvest the abundant

resources, social capital and explore the available opportunities for national sustainable development.

Against this backdrop, the chapter recommends that national, local, private and public institutions in the cultural sector should tap from the available data in Nigeria by investing in the verities of big data analysis software and associated hardware to continue to expand the potentials of the cultural sector and maximise its contribution to cultural transformation and national development. It is also recommended that Nigeria should continue to harvest, compile, integrate and consolidate its databases for utilisation in cultural transformation.

References

- Akanle, O. (2012). The ligaments of culture and development in Nigeria. *International Journal of Applied Sociology*, 2(3), 16-21.
- Ali, A., Qadir, J., Rasool, R. U., Sathiaseelan, A., Zwitter, A., & Crowcroft, J. (2016). Big data for development: applications and techniques. *Big Data Analytics*, 1, 1-24.
- Al-Mekhlal, M., & Khwaja, A. A. (2019, August). A synthesis of big data definition and characteristics. In *2019 IEEE international conference on Computational Science and Engineering (CSE) and IEEE international conference on Embedded and Ubiquitous Computing (EUC)* (pp. 314-322). IEEE.
- Andrienko, G., Andrienko, N., Boldrini, C., Caldarelli, G., Cintia, P., Cresci, S., ... & Trasarti, R. (2021). (So) Big Data and the transformation of the city. *International Journal of Data Science and Analytics*, 11, 311-340.
- Bassey, B. E. (2015). Transforming the Nigeria tourism industry through tourism entrepreneurial development. *African Journal of Business Management*, 9(15), 569-580.
- Crampton, J. W. (2015). Collect it all: National security, big data and governance. *GeoJournal*, 80, 519-531.
- De Mauro, A., Greco, M., & Grimaldi, M. (2016). A formal definition of Big Data based on its essential features. *Library review*, 65(3), 122-135.
- Du Toit, P., & Forlin, C. (2009). Cultural transformation for inclusion, what is needed? A South African perspective. *School Psychology International*, 30(6), 644-666.
- Ekpenyong, M. (2022). Changing Cultural Values and Grassroots Transformation in Nigeria. *Texila International Journal of Academic Research Special Edition* Apr 2022 DOI: 10.21522/TIJAR.2014.SE.

22.01.Art017

- Erhun, M. O. (2015). The relevance of culture to the socio-economic growth and development of Nigeria: A Legal Perspective.
- Favaretto, M., De Clercq, E., Schneble, C. O., & Elger, B. S. (2020). What is your definition of Big Data? Researchers' understanding of the phenomenon of the decade. *PloS one*, 15(2), e0228987.
- Flyverbom, M., Deibert, R., & Matten, D. (2019). The governance of digital technology, big data, and the internet: New roles and responsibilities for business. *Business & Society*, 58(1), 3-19.
- Gill Press (2024). What is Big Data. <https://whatsthebigdata.com/data-generated-every-day/>
- Hilbert, M. (2016). Big data for development: A review of promises and challenges. *Development Policy Review*, 34(1), 135-174.
- Jarmin, R. S., & O'Hara, A. B. (2016). Big data and the transformation of public policy analysis. *Journal of Policy Analysis and Management*, 35(3), 715-721.
- Khan, N., Yaqoob, I., Hashem, I. A. T., Inayat, Z., Mahmoud Ali, W. K., Alam, M., ... & Gani, A. (2014). Big data: survey, technologies, opportunities, and challenges. *The scientific world journal*, 2014(1), 712826.
- Klein, J., Buglak, R., Blockow, D., Wuttke, T., & Cooper, B. (2016, May). A reference architecture for big data systems in the national security domain. In *Proceedings of the 2nd International Workshop on BIG Data Software Engineering* (pp. 51-57).
- Kshetri, N. (2014). The emerging role of Big Data in key development issues: Opportunities, challenges, and concerns. *Big Data & Society*, 1(2), 2053951714564227.
- Nwanga, M. E., Onwuka, E. N., Albinu, A. M., & Ubadike, O. C. (2014). Leveraging big data in enhancing national

- security in Nigeria. *International Journal of Knowledge, innovation and entrepreneurship*, 2(2), 66-80.
- Pencheva, I., Esteve, M., & Mikhaylov, S. J. (2020). Big Data and AIA transformational shift for government: So, what next for research?. *Public Policy and Administration*, 35(1), 24-44.
- Sagioglu, S., & Sinanc, D. (2013, May). Big data: A review. In *2013 international conference on collaboration technologies and systems (CTS)* (pp. 42-47). IEEE.
- Singh, S. K., & El-Kassar, A. N. (2019). Role of big data analytics in developing sustainable capabilities. *Journal of cleaner production*, 213, 1264-1273.
- Tugbokorwei, M. U. E. (2008). Culture and National Development in Nigeria: A Critical Appraisal. In *Professor Femi Osofisan International Conference on Performance: Book of Proceedings* (pp. 72-80). Valid Publishing Co., Awka.
- Van Puyvelde, D., Coulthart, S., & Hossain, M. S. (2017). Beyond the buzzword: big data and national security decision-making. *International Affairs*, 93(6), 1397-1416.
- Web Manager (2024) Big Data Analytics and its Role in Decision - Making in Nigeria . <https://webmanager.ng/blog/big-data-analytics-its-role-in-decision-making/#:~:text=Big%20data%20analytics%20plays%20a,market%20trends%2C%20and%20emerging%20patterns>.
- Yaqoob, I., Hashem, I. A. T., Gani, A., Mokhtar, S., Ahmed, E., Anuar, N. B., & Vasilakos, A. V. (2016). Big data: From beginning to future. *International Journal of Information Management*, 36(6), 1231-1247.
- Ylijoki, O., & Porras, J. (2016). Perspectives to definition of big data: a mapping study and discussion. *Journal of innovation management*, 4(1), 69-91.