The Impact of Big Data Analytics and Business Intelligence on Management Accountants: A Critical Appraisal

Ehiriudu Jude Alaoma
Lecturer, Department of Accountancy,
Institute of Management & Technology (IMT), Enugu, Enugu State, Nigeria
Akudo Bibian Obilor
Financial Analyst, Department of Financial Control,
First City Monument Bank (FCMB), Victoria Insland, Lagos, Nigeria
Igweonyia Obiageli Virginia
Lecturer, Department of Accountancy,
Institute of Management & Technology (IMT), Enugu, Enugu State, Nigeria
Nwobobo Azuka Tina
Lecturer, Department of Accountancy,
Institute of Management & Technology (IMT), Enugu, Enugu State, Nigeria

Abstract:
This study critically examined the Impact of Big Data Analytics and Business Intelligence on Management Accountants in three multinational companies namely Apple, Amazon and Google were the impact of big data and business intelligence on Management Accountants evaluated. Literature review was used as the basis of the analysis of the impact in the three companies. There was no statistical inference or empirical analysis. The impact was measured using literature review. The study reveals that the three companies had a huge impact on the work of management accountants on the area of storage of business information, retrieval of business information, dissemination of business information and decision making. Also, the study pointed out that the advent of big data and business intelligence had made the work of management accountants easy and secured. In conclusion, it was stated that the usefulness and the importance of big data analytics and business intelligence technologies to the three multinational companies and other companies in the world at large, cannot be over- emphasized. Finally, the study recommended that every organizations both public and private should leverage on the new technology.

Keywords: Big data, big data analytics, business intelligence, management accountants, multinational companies

1. Introduction

1.1. Background of Study

Data are those business resources that have not been transformed into information. Business intelligence and analytics (BI&A) is a modern technology that helps accountants in day to day reporting and decision making in their businesses. It is obvious that the primary functions of management accountants are decisions making and to instil controls in the organization.

The advent of big data, business intelligence and data analytics has improved the work of management accountants in successfully bringing together the gains from business intelligence and analytics (BI&A) techniques into the managerial accounting process.

Oxford dictionary latest edition defined big data as ''extremely large data sets that may be analysed computationally to reveal patterns, trends and associations, especially relating to human behaviour and interactions''. Companies, governments and private individuals are investing a lot of their resources in information technology (IT) towards managing and maintaining big data. On the other hands, Barbara (2014) defined business intelligence (BI) as a ''technology driven process for analyzing data and presenting actionable information to help executives, managers and other corporate end users make informed business decisions''.

However, big data accessibility creates lots of unprecedented opportunities and lead ways for ravelling solutions to the challenges of storage, management, and processing of data used by management accountants. Roger, Paulo and Edward (2012), opined that 'Business Intelligence and Analytics are emerging disciplines that seek to address the demands of this new era. Also, they articulated that Big Data and BI&A present unique challenges and opportunities not only for the research community but the entire accounting information system programs used in business schools.

Also, advance analytics known as big data analytics techniques works on big data set. Here big data and analytics combined together to form a huge business intelligences (BI) that produces a profound result. The multinational companies combined the two trends in order to have a big effect in business data analytics. It is obvious that for the past three years many organizations like Amazon, Apple, Google and other multinational organizations have utilized the huge effects of using analytics and business intelligence in managing large sets of data in their different business locations and still produces efficient results.

1.2. Statement of the Problem

Big data analytics and business intelligence had been a wonderful technology which have helped management accountants in several ways in carrying out their enormous work. There are several challenges that arises as a result of the use of big data analytics and business intelligence which the study tends to point out. They include:

- The cost of buying the necessary computer devices for the operation of big data sets, this has been a serious challenge among small companies and entrepreneurs
- Big data can suddenly become vague and turned into an obsession in large organization. This could occur as a result of physical damage of the storage system as the system is analyses large amounts of data.
- Data protection and security, in solving this problem data analysis and software engineers has provided a solution by providing password and personal identification number (PIN) which gives the user access to the specific data sets.
- Trained personnel that are qualified to manipulate, maintain and analyse big data may be difficult and capital intensive to recruit for some organizations.

1.3. Objectives of the Study

The objectives of the study are enumerated below:

- To ascertain the usefulness of big data analytics and business intelligences to management accountants in multinational companies.
- To appraise the challenges of buying new computer devices for the operation of big data analytics and business intelligences in companies.
- To maintain a data security by the use of standard procedures in protecting and securing the companies data sets, from the public through passwords and 'PIN' controlled access management.
- To train qualified personnel or employees that will control the whole lots of big data sets in the company.

1.4. Research Questions

The following research questions emanated from the research objectives; they are as follows:

- To what extent have big data analytics and business intelligent helped management accountants in controlling and managing their business?
- Has the installation of computer devices helped in the operation of big data analytics and business intelligence in companies?
- What is the level of compliance and adherence to standards and procedures in securing the companies access protocols to big data sets?
- Have the companies employed qualified personnel man-powers that are well trained on the big data analytics and business intelligence mechanism or operation?

1.5. Significances of the Study

The following are the importance of the study

- The study has helped in unveiling the meaning and the whole concept of big data analytics and business intelligence in multinational companies, government owned enterprises and private enterprises.
- The study revealed the importance of big data analytics and business intelligence in managing, controlling big data huge effects in storage, retrieval and dissemination of information in different organizations.
- The study pointed out the importance of big data analytics in decision making of business organization. The onerous function of Management Accountants in every business concern is decision making at the echelon level.
- The study showed that big data analytics and business intelligence is to analyse all information and generate the predictive mode of the outcome of the information in the nearest future, this helps business organisations to opportunities of making profits and reduced cost, thereby increasing the revenue of the organization.

2. Literature Review

This study sets out to provide a brief literature review of BI&A, pointing out the roles of BI&A education in business School and entirely management accounting in particularly then essay x-rays the challenges faced by management accountant in delivering BI&A education to the end-users of accounting information.

Business intelligence (BI) encompasses a broad range of analytical processes and tools to manage and analyze Big Data. The main objective is to perform data analysis which is used for decision making. This information and analysis are the key reasons for improving organizational performance and profitability. The BI technologies should be easy to use and cost-effective so that the benefits outweigh the cost when compared.

In the words of Pavans (2013) big data refers to a range of large data sets almost impossible to manage and process using traditional data management tools not only due to size, but also their complexity''. Juxtaposing big data and business intelligence analytics, the two works closely. Business intelligence and analytics is the driving force on which the big data analytics works. Roger (2005) stressed the point that 'big data can be seen in the retail, finance and business where enormous data from stock exchange, banking, online purchasing and shopping onsite through data flows computerized systems, inventory monitoring, customer behaviour and market'. The upsurge in computational and storage power facilitates the agglomeration, storage and analysis of big data sets.

Hsinchum, Roger and Veda (2012) explained that, 'business intelligence and analytics has emerged as an important area of study for both practitioners and researchers', reflecting the magnitude and impact of data related problems to be solved in the contemporary business organizations. They further pointed out that 'business intelligence research provides a framework that identifies the evolution, application and emerging research areas in business intelligence and analytics''. In furtherance of their study in BI&A, they came up with three key areas in BI&A research known as BI&A 1.0, BI&A 2.0 and BI&A 3.0. They defined and described these key areas based on challenges and opportunities associated with BI&A research and education identified. They also, reported a bibliometric study of critical BI&A publications and researches documented for academic industries over a decade, these researches comprise of special issues on BI&A.

Luhn (1958) acknowledges that business intelligence has become not only an important technology for improving the business performance of an enterprise but also a tool for enhancing business, e-commerce, and e-services. Also, business intelligence is a platform for developing organization intelligence, management intelligence, enterprise intelligence and marketing intelligence. Luhn (1958), further explained that intelligence in business intelligence has to do with understanding completely the difficulties faced in manipulating big data and big data technologies that involves the use of big data analytics services to improve business intelligence in e-commerce, e-services, and other information systems.

Big data Analytics can be explained as the management of collecting, organizing and analyzing big data to discover, visualize, and display patterns, knowledge and intelligence as well as other information within the data. Luhn, opined that big data analytics operate in this form 'data warehouse (DW) + data mining (DM). 'DM + statistical modelling (SM) + machine learning respectively + visualization + optimization' is equal to big data and analytics. The foremost data warehouse providers including, Amazon's Redshift, Google's Big Query, Microsoft's Azure, and Teva data analytics agree that big data intelligence and analytics techniques in general, can facilitate business decision making and realization of business objectives through bridging of the current problem and future trends. Creating profit models to forecast future opportunities and threats and historical production or profit data to enhance organizational performance using the above-mentioned techniques and innovations.

Lim (2013) stated that Big data analytics and Business intelligence has drawn increasing attention in the computing business and e-commerce community, Roger and Veda (2012) agreed obviously that Business Intelligence and Analytics has emerged as an important area of research for all managers and business experts in equipping business activities, in relation to solving problems in contemporary business societies. Business intelligence and analytics and big data analytics are two important related fields. The importance of these two fields in academics and business communities cannot be over-emphasized in the past two decades of operations.

The IBM Tech trends report (2011) pointed out that business analytic as one of the major technologies that emerged in 2010. The study conducted by Bloomberg Business week (2011) shows that ninety-seven percent of companies with revenue that is above $100 million were found to be operating with business analytics.
Apart from the application of BI&A in data processing and analytical technologies, business intelligence and analytics can be applied to various high-impact applications like e-government, public healthcare, e-commerce, security, transportation industries, and market intelligence. Watson and Wixom (2007) explained that big data and business intelligence were data structured, collected by companies through various systems and often manufactured in a database management system.
Doan et al (2011) and O'Reilly (2005) have brought to bear in very new and exciting knowledge of BI&A in their collaborative researches in the 2000s centred on text and web analytics for unstructured web content. The study revealed an immense number of companies, industry and customer information in text and web mining techniques. This is done by analyzing customer data logs using web analytics tools in Google analytics that can provide a trail of the user's online activities such as browsing and purchasing patterns. This is another milestone achievement in BI&A technologies. In the 2004, many web 2.0 applications developed and created an abundance of user-generated content from online social media forums like; online group weblogs, social networking sites, social multimedia sites, and social games. O'Reilly (2005) concluded that there are reference and feedback on everyday events and activities in every organization.

Michael (2013) explained that big data had gone through several years and decades of innovations, that it did not suddenly emerge as people were seeing it of recent. Computer veterans attested to the fact that big data can be traced back during the era of mainframe computers, stating that the operation and manipulation of complex and sophisticated computer devices has led to the increase in the activities of multinational companies in several countries in the world.

Business Intelligence and analytics technologies in management accounting perspective has widened the scope and horizon of management accounting practices. The numbers of personal computers (PC) in use and highly connected mobile phones like iPad, iPhones, and Android phones have expanded the applications and supply of management accounting software which are hosted on internet-enabled equipment. October 2011, an article in the economist (2011) showed that managers and accountants all over the world (about 480 million) are connected to the internet enable phone devices and surpassing the number of managers and accountants using laptops and PCs (about 380 million units) in 2011. Also, the study projected the number of mobile devices connected would rise to 10 billion in 2020.

Roger (2005) summarizes by bring the points together to say that, 'the emergence of big data has facilitated the understanding of business intelligence and advance analytics technologies. He concluded by saying that 'the techniques have a predictive form of analytics, there is data mining stage, text analytics and lastly statistics and language processing'. All these phases evolved to track the states of business activities have tremendously helped customers behaviour and the managers in taking productive and persuasive decision on the business. He further said that these methodologies can be applied to various high- impact applications such as e-government, e-commerce, healthcare and security.

3. Findings

The big data business intelligence and data analytics technologies revealed that the emerging technology had helped in all the sectors of the economy and the management accountants have used several applications and advance in analytic technologies in enhancing their professional work schedule. Also, the advent of BI&A and big data analytics technologies have made their work easy and secure. The trail on every job schedule can be retrieved through login passwords and other secondary applications.

Another impact of Big Data business intelligence and big data analytics technologies has helped management accountants in several fields of life, data intelligence and analytic technologies applied and adopted in e-commerce and market intelligence, e-government and politics, science and technology, smart-health and well-being, security and public safety.

Frankwick (2012) shared his knowledge on the new field of study on big data analytics explained that the breakthrough in big data analytics shows great usefulness and innovation in business world, defined the whole arrangement that pointed out the visible and invisible worth's of a business assets and liabilities into marketable material that can be used to redefine markets, enhanced profit margins and rediscover new business windows and possibilities. He explained that big data analytics has reveals another method of accessing the competitiveness of a genuine business comparative and competitive advantages. A look on the financial impact which big data analytics and business intelligence brought to bear in our both local and international businesses through interconnectivities of business and trade online cannot be over stressed. These can be witnessed in our world- wide or globally recognized online businesses like eBay, apple and Amazon, these organizations had seriously leverage on big data analytics and technologies component in business strategic growth.

4. Conclusion

It is obvious that business intelligence and analytics are new technologies that have facilitated in the area of data collection, verification and assembling of the data collected to support managers and other users of the information in decision making. The onerous function of management accountants is decision making as such data from BI&A help in supporting the activities of the management accountants. In all ramifications, management accounting has successfully gain ground in integrating business intelligent and analytics techniques into managerial accounting process and tasks.
Chartered Institute of Management Accountants, in recognition of the role of BI&A on big data, has given grants for its members to undertake research on BI&A. This has really emphasized the great importance and values business intelligence and big data analytics could bring into business development in general and management accountants in particular.

In agreement with Barbara (2014), 'the overall importance or role of business intelligence to companies, government, individuals and management accountants is to improve access to firm's data and using them to increase profitability', collected data helps in business processes improvement. This helps to create strategic business decision that brings accelerated productivity and tremendous increase in revenue of the business and overall growth in the business which form the core contribution of management account.

Finally, aligning with Roger (2005) summary of the importance and impact of BI&A, actually, the emergence of big data has facilitated the understanding of business intelligence and advance analytics technologies. Their application especially in tracking the states of business activities, and customers activities had greatly helped the managers in making productive and winning decision on the business. this impact in general help the management accountant actualize more in less time impacting on productivity and understanding business direction and trends.

In conclusion, impact of big data business intelligence and data analytics on management accountants is huge and encompasses several segments of economy where management accountants' function in different facets of life. As business continue to need fast pace business decision through connected devices on the cloud and less reaction time, realization of business objectives through linking of the current challenges and future trends will continue to drive business and as such impact the work of the management accountant greatly. Hence big data business intelligence will continue to help the management accountant in actualizing this goal of using available business data to forecast and track emerging trends, that form the bedrock of investment decision and profitability estimation.

5. Recommendation

The study recommended that every organizations both public and private organization should leverage on the new technology in order to facilitate easy storage of information, retrieval of information and dissemination of information which big data analytics and business intelligence encourages. Big data analytics in business is needed because of its usefulness in analysing relevant business information and producing a predictive model of what the outcome will be. Finally, business intelligence and big data analytics is recommended by this study because it is a veritable tool for decision making in digitalised organisations and the usefulness in our present generation cannot be relegated to the background.

6. References

i. Barbara W. And David D. (2014) The current State of Business Intelligence in Academia: The Arrival of Big Data. Communication of   Association of Information System Journal, Volume 34, 2014

ii. Doan R.R and AY. Haley (2011) Crowd sourcing System on the world –wide web. Communications of the ACM Vol.54, No4 page 86-96 2011

iii. Edward R and Frankwick L (2012) Effect of Big Data Analytics on New Product Success: A Knowledge Fusion Research. Vol 69, issue 5, May2016, Page1562-1566 Perspective. Journal of Business

iv. Hsinchun Chen (2012) Business Intelligence and Analytics from Big Data to Big Impact, Management Information System, Quarterly, 1165-1188,2012

v. LIM E. P, Chen G and Chen G. (2013) Business Intelligence and Analytics (BI&A): Research Directions. ACM Transaction on Management Information System (TMIS 3 (4), 1-10, 2013)

vi. Liang T. Pang and Liu Yu- Hsi (2018) Research Landscape of Business Intelligence and Big Data Analytics: A Bibliometrics Study Expert System with Application Journal, Volume 111, Issue30, page 2-10

vii. Luhn H.P (1958) Business Intelligence System, IBM Journal of Research and Development 2314-319

viii. Michael Minelli at el (2013) Big Data, Big Analytics: Emerging Business Intelligences and Trends for Today's Business, John willy &sons Inc, Hoboken, New Jersey, USA. 2013.

ix. Tim O'Reilly (2005) Design Patterns and Business Intelligence Model for next generation of Softwares: Communication and Strategies No 65, First Quarter 2007

x. Roger H.L Chiang (2012) Business and Analytics Education and program Development: A Unique Opportunity for the InformationSystems Disciplines. ACM on Management Information system (TMIS) 3 (3), 1-13,2012.

xi. Roger H.L (2012) Business Intelligence and Analytics from Big Data to Big Impact, Journal of Management Information System, Quarterly. DoI:10.2307/41703503, December, 2012.

xii. Pavan S. (2013) Big Data and Business Intelligence: International Journal for Enhanced Research for science and Technology, Volume2 (8), 87-96

xiii. Shaokun F. And Raymond Y.K (2015) Demystifying Big Data Analytics for Business Intelligence Through the Lens of Marketing Mix. Big Data Research. Vol. 2 Issue 1, March 2015

xiv. Veda C. Storey (2012) Business Intelligence and Analytics from Big Data to Big Impact. Management information System. Quarterly, 1165-1188, 2012.

xv. Watson and Wixom (2007) The Current State of Business Intelligence, Journal of Computer Science, SEPTEMBER 2007, Page 96-99, Vol 40, DOI, Book mark:10.1109/mc:2007, 331

xvi. IBM Tech Trends Reports (2011) Learn how IBM Technology and Business and IT. Tech 2011.

xvii. ACCA Study text (2020) Management Accounting Interactive Text; BPP Learning Media, London, United Kingdom.

xviii. Oxford Advance Learners Dictionary 2015, by Albert Sydney Hornby. https:// www. Bloomberg.com, Bloomberg Business week- September issue