

**BIG DATA: DESCRIPTIVE ANALYTICS AND PERFORMANCE OF COMMERCIAL BANKS
IN PORT HARCOURT, RIVERS STATE, NIGERIA**

¹Dr. (Mrs.) Dumo Nkesi Opara and ²Dick, Aa-nu Sunday

**¹Department of Office and Information Management, Faculty of Management
Sciences, Ignatius Ajuru University of Education, Port Harcourt, Rivers State, Nigeria.**

**²Department of Office and Information Management, Faculty of Management
Sciences, Rivers State University, Port Harcourt, Rivers State, Nigeria.**

Email: aa-nu.dick@ust.edu.ng

ABSTRACT

This study surveyed Big data: Descriptive analytics and Performance of Commercial Banks in Rivers State, Nigeria. Big data analytics is the application of technological tool to solve Commercial Banks problems in real time. It is the process of transforming raw data collected from multiple data sources into useful information, which describes the past. The effective description of the past in real time helps in understanding the customer's expectation and economic growth. The objective of this study examined how descriptive analytics influence the performance of Commercial Banks in Rivers State, Nigeria. Two (2) research questions and two (2) hypotheses were employed for this study. The theoretical foundations anchored in Rough Set theory by Zdzislaw Pawlak, 1982. The research design was the cross-sectional survey. It entailed both descriptive and inferential statistics. The study population comprised of twenty one (21) commercial banks in Rivers State, Nigeria. A total of one hundred and sixty eight (168) respondents were computed from the study population using simple random sampling techniques that constitute the sample size of the study. Data were collected from both Primary and secondary sources using structured questionnaire. The 4-point Likert scale was used to analyzed the univariate variables and simple linear regression analysis (parametric statistics) was used to analyzed the bivariate variables, available in Statistical Package for Social Sciences (SPSS version 23). The major findings revealed that big data: Descriptive analytics is a timely intervention tool for enhancing customers' satisfaction and economic growth of Commercial Banks in Port Harcourt, Rivers State, Nigeria. The study concluded that big data: descriptive analytics influenced customers' satisfaction and economic growth of commercial banks in Port Harcourt, Rivers State, Nigeria. The study therefore recommended that commercial banks should not only focus on acquiring customers they cannot manage in the name of profitability, rather they should implement big data: descriptive analytic to enable the commercial banks meet up customer's expectation. Also, banks should be customers focus rather than focusing profit, causing negative impact on the customers and the economy (environment they operates) of the state.

Keywords: Big data, Descriptive analytics, Customers satisfaction and Economic growth.

INRODUCTION

The history of banking in Nigeria dates back to 1892 when African Banking Corporation and Bank of British West Africa now known as first bank were established. This means that banking business has existed for over one century in Nigeria (Olukayode and Somoye, 2018). Commercial banks are empowered by law to undertake the business of lending and borrowing in the economy, the function bridged the savings and investment gap (Zaagha, 2020). The commercial banks are identified as the main agents of saving mobilization (Ogbuabor, Malaolu & Mba, 2013). The inception of banks in Rivers State was quite a good development to the people. Before this current time customers' knowledge were mainly based on savings and borrowing of funds. The introduction of the new technology has changed the concept and perceptions of the customers from traditional banking system to a more informed customers focus. Big data is

characterize/describe as the 3Vs (volume, velocity and varieties), these data set creates serious problem to the Commercial banks if not properly manage to derive meaningful insight for banking transaction in real time or on-demand. The new technology today employed sensors devices, wearable, mobile applications, website capable of collecting data on the go. These causes data overload if adequate real time tool like descriptive analytic is not employed. These data overload poses serious challenges for banks still using the traditional approach, it is a major reason why we are still experiencing lots of customers queue with numerous complaints and problems, ranging from, delay services, errors in transaction, network failure etc. Acquiring information technology does not give complete solution to the problem. There is the need to move further to the place of analytics. Achieving good results requires strategic implementation and effective operation. These are major problems of commercial banks in Rivers State, actually they have succeeded in acquiring massive hardware, to capture, store and retrieve information, but there is still lack of analytical tool which is more important in strategic business management. Big data analytics is backward and forward looking, it looks at what is available now (descriptive), why something happen (diagnostics), what will happen in the future (predictive), and what solution we can provide (prescriptive). Descriptive analytics is basically used in describing or summarizing historical data. It is one of the business widely used analytical tool. It gives better understanding of what is going on within/outside the organization. This paper surveyed the concept of big data: descriptive analytics and performance of commercial banks in Rivers State.

Descriptive analytics helps business to understand, the number of time customers has visited the bank, types of transaction(s) carried out, how are they satisfied with the banks products and services. Banks in the developed world are customers focus rather than business focus. Descriptive analytics tools are used to find out how things exist (pattern) in organizations (banks). Knowing how things had happen will help individuals and organizations to ascertain what will happen in the near future. The world today is moving towards the next generation of recommender system that will enhance customers' satisfaction and economic growth (Adomavisins, & Tuzhilin, 2005). Although, we cannot say that, banks and other businesses in Rivers State have done nothing in the area of information technology and communication, actually, they have made tremendous impact in the area of data acquisition, storing and management but little or nothing has been done in the area of analytics (Bestman & Dick, 2020).

Statement of the Problem

The commercial banks are the pivot upon which all other sectors of the economic stand, be it transportation, social, political and educational sectors etc. Once there is a problem in the banking industries, the whole system (nation or organizations) collapses. Money is the common means of transactions; banks are financial institutions that take the responsibility of the management of organizations, government and public investment. The inadequacy of our banks today is a major factor affecting the economic growth of our nation, Nigeria and Rivers State in particular. The banks have not taken into considerations, the customers' expectation (satisfaction). In most cases people are still filing up in the banks in Rivers State, wasting precious time for just few transactions. Banks in Rivers State has not also buy the idea of helping organizations and government in the distribution of financial resources from the area of surplus to the area of scarcity. They delivered products and services that customers are not interested in. No adequate feedback mechanism before developing their products and services for customers. They kept on acquiring customers they cannot manage effectively for the sake of profitability that never comes through as a result of the traditional tool they are still using. It is difficult for them to meet customers need on demand (real time) using the traditional tool. These are some of the problems that necessitated the concept big data: descriptive analytics and performance of commercial banks in Rivers State, Nigeria.

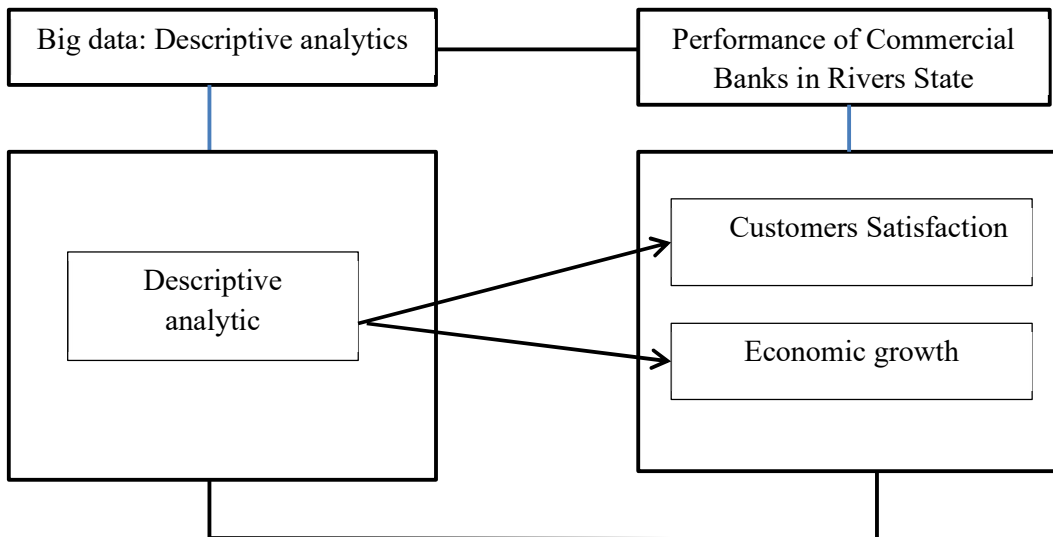


Figure 1: Big data: Descriptive analytics and performance of commercial banks in Port Harcourt, Rivers State

Aim and Objectives of the Study

The aim of this study is to investigate the linear relationship between Big Data: Descriptive analytics and Performance of Commercial Banks in Rivers State, Nigeria. In line with this goal, the sub objectives are to;

- i. determine the extent to which descriptive analytics influence customers satisfaction of commercial banks in Rivers State, Nigeria.
- ii. determine the extent to which descriptive analytics influence economic growth of commercial banks in Rivers State, Nigeria.

Research Questions

Based on the above stated aims and objectives of this study, the following research questions are formulated to study the concept big data: descriptive analytics and performance of commercial banks in Rivers State as follows;

- i. To what extent does descriptive analytics influence customers' satisfaction of commercial banks in Rivers State, Nigeria?
- ii. To what extent does descriptive analytics influence economic growth of commercial banks in Rivers State, Nigeria?

Research Hypotheses

The following Null hypothetical statements tentatively answered the research questions as follows;

H₀₁: Descriptive analytics does not influence customers' satisfaction of commercial banks in Rivers State, Nigeria.

H₀₂: Descriptive analytics does not influence economic growth of commercial banks in Rivers State, Nigeria

Concept of Big Data Analytics (BDA)

Big data has made a significant impact in many sectors of the developed world, such as transportation, marketing, healthcare, manufacturing and retail. Apart from the government sector, the financial sector has more to gain from leveraging big data; the technology does not only help financial institutions to maximize the value of data, it also help them in gaining competitive advantages, minimize costs, converting challenges to opportunities and minimizing risks in real time. The impact explained the huge opportunity financial services firms gain from the new data sets and strategies to business operations which will optimize capital allocation, cash management and currency processing (Subarna & Smys, 2021).

Favaretto et al. (2020) defines big data as a range of different concepts, from the collection and aggregation of vast amounts of data, to a plethora of advanced digital techniques designed to reveal patterns related to human behavior. It describes the vast growth and availability of data in a distributed database, both structured and unstructured. It refers to a technological phenomenon which arose in the mid-1980s due to the improvement of computers, growing storage and processing capacities. These have provided new and improved ways of sifting through the infinite quantities of data available. He added that big data is in-field shorthand, it reduces the vast mass of data coming from the distributed database, it valued, give meaning to the data, increase daily production within global networks, today, data is growing exponentially (internet generated data) at a pace exceeding the capacity of current databases. Riahi and Riahi (2018) describe big data not only by the amount of information but also its variety and complexity as well as the speed by which the data has to be analyzed or delivered. Ingram Micro Advisor (2018) distinguishes big data from congenital (disorderliness) data with its three 3Vs, namely; Volume: The quantity of analyzed data exceeds the capability of conventional analytics and statistical modeling tools. The analysis of big data scales to handle petabytes and has the possibility to handle larger volumes. Riahi and Riahi (2018) added that the sheer volume of stored data is exploding, and IBM predicts that by 2020 there will be 35 zettabytes stored in the distributed database across the globe. Velocity is the speed of accessing data. Conventional Business Intelligence (BI) applications use historical data dating back weeks, months or quarters, while big-data relies on real time information in order to deliver rapid insights. The velocity of data depends not only on the speed of the data flow but also the pace at which it must be collected, analyzed and retrieved (Riahi & Riahi, 2018). Big data looks at all sorts of information, structure, semi structure and unstructured, stored in the Data Warehouse (DW).

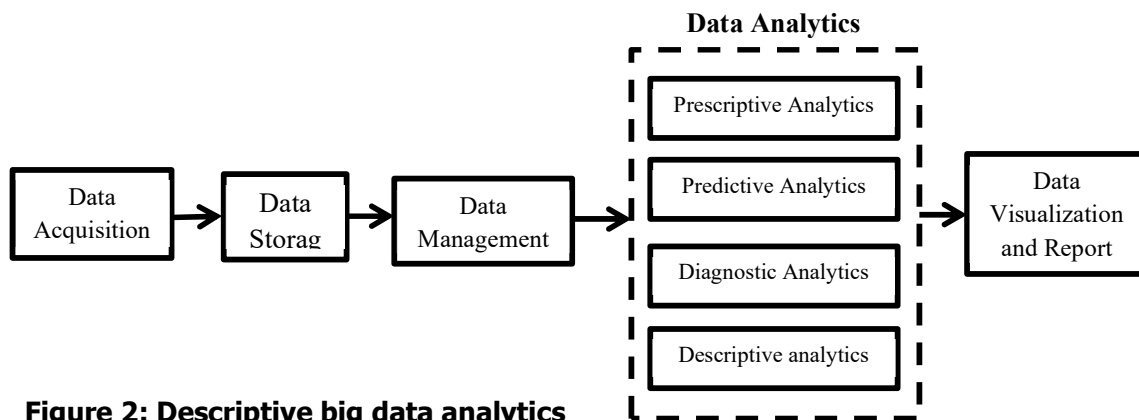


Figure 2: Descriptive big data analytics

Descriptive analytics

Descriptive analytics is the process of transforming raw data collected from multiple data sources into useful information (Yu, Wang & Shami, 2017).. Descriptive analytics describes the past and what is happening now (in real time). For example banks transaction records the number of

customers in a day, their deposit amount etc. The concept, descriptive analytics is to describe, narrate, explained what is happening within the system using statistic and mathematical tool in real time. Informing the operator or users of the system what is happening on the go helps to avoid certain errors and prevent unwanted intruders to enter the system. Descriptive analytics is the foundation of any analytic, it is the base upon which the highly data-driven application scenarios of the Internet of Things (IOTs) system, therefore, it prepared good ground for other types of analytics like diagnostics analytics (Yu, Wang & Shami, 2017).

Descriptive analytics is used to summarize data in an organized manner by describing the relationship between variables in a sample or population. Results of descriptive analytics represent a vital first step when conducting research and other investigation, it always occurs before making inferential statistical comparisons (CI&T United States, 2014). Descriptive analytics include types of variables (nominal, ordinal, interval, and ratio) as well as measures of frequency, central tendency, dispersion/variation, and position (Kaur, Stoitzfus, & Yellapu, 2018). It condenses data into a simple summary, this enable banks to assess specific populations in a more manageable form. It addresses major areas of core competencies, practice-based learning and improvement, and customer knowledge (Kaur, Stoltzfus & Yellapu, 2018).

It is the most commonly used and well understood type of analytics. It was the earliest to be introduced and the simplest, for any professionals to adequately understand a process, he/she must first identify the object, describe the object, and explain the pattern of occurrence using the various descriptive statistics concept which includes; mode, media, mean and standard deviation (Lismont, & Vanthienen et al., 2017). This includes identifying customer's behavior and economic growth, status of account, frequent banking rate, nature of business etc.

It is more business data-driven than the other models. Almost all businesses start with descriptive analytics. It is at this point the customers is identifies, types of transaction, account type, value of account or cash, nature of operation (internet banking, ATM, cheque book) etc. Descriptive analytics uses data to understand past and current customer operation and make informed decisions about the customer (Muller, Fay, & VomBrocke. 2018). The model involves; categorizing, characterizing, aggregating and classifying data, converting data into useful information, that gives better understanding before analysis (Asamoah et al., 2017). Such data summaries might be in the form of meaningful charts and reports that, for example, illustrate customers' operations online, physical banking rate, use of ATM, and the like. It is useful in answering questions such as: How many customers were regular, how many account dormant? Which types of operation were predominant? And what was the revenue generated within the last quarter? ((Shmueli & Koppius 2011)

Descriptive analytics uses a lot of visualization. One could, for example, obtain standard and customized reports and drill down into the data, running queries to better understand the usage and effect of a new products and services. It answers such questions as, how many customers did we maintain in the last four months? What was our revenue and the labour cost within the last quarter? The means is a clear indicator of how many and what types of facilities to improve for better performance? Which facility has highest cost-quality ratios (mode)? What do my customers look like? Which type of customers should be targeted for high performance, promotion (trial)? (Pan et al., 2016).

It measures historical data set with the aim for gathering data for further analysis. It is the basis for understanding data set. Its measures may be used to describe very different data sets. The mean is the average value of a set of data (Kaur, Stoitzfus & Yellapu, 2018). It is calculated by adding two or more quantities together and dividing by the number of quantities, for example, the mean of two numbers, 10 and 20, you need to add these two numbers and then divide by 2 (which is the number of quantities). The mean is a popular statistical tool used in the banks operation. Although, it is common and many people are familiar with it, but are not aware that it is critical in decision making. It also provides useful summary information about the entity, and it is easily used with other statistical measurements. Descriptive analytics is a process for "finding banks and customers relationships (historical) or existing data" (Haas et al., 2011; Ingram Micro Advisor,

2017). According to recent research, conducted by CI &T, about 90%, the companies use this very basic analytics technique, on occasion, and only 35% of company's survey reported that they use this technique on a consistent basis (CI &T United States, 2014).

Although, key decision can be deduce from descriptive analytics, it is not the final stage of analytics, it is the beginning process of analytics. It organized data for further analytics. It is beneficial to retailers that need few potential mechanisms that can provide the needed customers satisfaction and economic growth. Big data: descriptive analytics system aid retailers in modernizing traditional marketing, it helps for effective pricing or advertising in response to the forces of demand and supply. In more organized organization, it a common metric estimating Customers' Acquisition Cost (CAC) (CI &T United States, 2014)..

Researchers shows that descriptive analytics is used as a monitoring tool to assess the value of other operations of the employees but does not drive decisions directly. For example, if an organization invests in retargeting campaigns or in website personalization for customers, it would be difficult to measure the effects of these investments and optimize parameters without monitoring potentially affected. In this case descriptive analytics is used to complement other method. It helps to assess and amplify the strategies that work best. This type of analytics is commonly referred to as "complementary mechanism" (CI &T United States, 2014)..

Concept of Commercial Banks Performance

Over the years, Commercial banks have been traditionally playing important role in financing various sectors of the economy especially in developing nation like Nigeria (Abul, 2009). This is because commercial banks involved in financial intermediation process, this entails channeling funds from the surplus units to the deficit units of the economy, thus transforming bank deposits into loans or credit. Its function in various dimensions in Nigeria economy which include: acceptance of deposit from customers for safekeeping, lending to customers, provision of loans and overdraft, discounting bills of exchange (Doko & Miskovski, 2019). It is important to state that of all these functions mentioned, commercial banks major operation is the acceptance of deposits and granting of loans to customers. An efficient financial intermediation function of commercial bank will boost the micro-economic growth process which is the productive capacity of the economy. Doko and Miskovski (2019) opined that a developed financial sector should reflect the ease of entrepreneurs with sound projects to obtain financial resources and the confidence with which investors anticipate adequate returns on investment. Bank credit is the borrowing capacity provided to an individual by the bank in the form of credit or loan. The total bank credit the individual has is the sum of the borrowing capacity each bank provides to the individual or organization.

Credit is the extension of money from the lender to the borrower. Vincent (2018) noted that credit implies a promise by one party to pay another for money borrowed or goods and services received. Credit cannot be divorced from the banking sector as banks serve as a conduit for funds to be received in form of deposits from the surplus units of the economy and passed on to the deficit units who need the funds for productive purposes. Banks are therefore debtors to the depositors of funds and creditors to the borrowers of funds, hence the name Commercial Banks.

The financial (commercial banks) services industry plays a significant part in the overall growth of an economy by generating employment, providing various investment avenues to the investors and financial services to the customers and the community. Economic growth actually leads to economic development, for which capital required is provided through the financial services industry. Capital is formed through the mobilization of resources by the financial services industry, its accumulation is the key element of economic growth strategy. The banks in the economy aid in making funds accessible by moving excess funds from depositors (with no instant requirements of those funds) and channeling those funds as a credit to investors who have excellent ideas for generating surplus funds in the economy, but have a deficiency of the funds to implement those ideas. This generates income for the banks, ensuring profitability. It is enlightening to understand

that the banking sector is a prominent one in the financial sector, as it has stood as one of the most extensive means of attracting many investors into the economy (Doko & Miskovski, 2019). The relationship between a country's financial sector and the overall performance of a country's economy has been evaluated in various studies. All of these studies have jointly hypothesized that this relationship's significance is not a static parameter but a dynamic concept. Moreover, economies with a highly established financial system develop their economy at a high rate. However, banks and other financial institutions stay at the forefront of contributing to economic growth through their activities, such as giving resources to the general public and lending funds to various organizations for their progress and economic development. The financial sector, which is comprised of banks and other lending institutions, leads to sustainable economic growth by engaging in profitable investments and equalizing savings from surplus areas to areas of deficit. Agreement on banks' significance in the economy is a matter of much academic interest. Past studies have focused on a variety of measures of banks' size to describe variations of the banks on the economic progression (Abul, 2009).

Customers Satisfaction

Osiogbu and Onuorah (2018) argue that increasing competition from nonbank institutions and from banks expanding into new markets is putting strong pressure on banks to improve their earnings and to control costs. The issue of costs and profit has re-directed banks to efficiency.

Turnbull and Gibbs (2015) posit that banks are more focused on earnings, mobilization of surplus financial resources and efficient intermediation. Commercial banks view acquisitions as a way to spread the costs of backroom operations and product development over a larger base and to design more efficient branch delivery systems that will eliminate overlapping offices, and other duplicative resources and services. Warimegbe, Abosede and Worimegbe (2018) are of the opinion that the common assumption, which underpins much of the efficiency research and discussion, is that increasing efficiency will lead to improved financial performance. The aim of efficiency is to minimize cost, increase earnings, satisfy customers and improve financial performance.

Customers' satisfaction and its measurement in financial literature revealed that service quality plays a significant role in enhancing profitability (Lynn, 2002). Therefore, profitability is not the essential indicators for banks performance. The better the service quality rendered by bank's employees, the more customer will be satisfaction. However, there has been limited research into the explicit linkages between bank efficiency, customers' satisfaction and financial performance of Commercial banks in Nigeria; although past research on this issue has examined a range of performance questions using a wide variety of indicators.

Definitely, establishing technical efficiency, customer satisfaction shows that bank performance has been a tasking and complex issue. Literatures reviewed showed that the study of Warimegbe, Abosede and Worimegbe, (2018) looked into the issue of banks performance and was done among Australian Banks. They stated that the internal determinants of banks performance are size, capitalization, efficiency, ownership structure, risk and market share.

Many literature reviewed on customers' satisfaction has not had a specific way of measurement, but rather different authors measure the concepts using various parameters. There are three ways of measuring customer satisfaction and these include a survey where customer feedback can be transformed into measurable quantitative data, focus group or informal discussions orchestrated by a trained moderator which revealed what customers think and Informal measures like reading blogs, talking directly to customers etc.. The following parameters can be used in measuring customer satisfaction; service quality, speed of service, pricing, complaints or problems, trust in employees, the closeness or relationship with customers, other types of services needed and positioning in clients' minds (Pasiouras, 2008). According to Felix (2017), customer satisfaction is seen as a key differentiator and increasingly has become a key element of business strategy in a competitive market place where businesses compete for customers. It is a global issue today that

affects all organizations, regardless of its size, whether profit or non-profit, local or multinational. Customers' satisfaction is a post-choice and behavioural evaluation or judgment of a specific purchase which indicates and precedes particular decisions if such purchase meets and performs below or above customers' expectations (Karray & Chichti, 2013).

Economic growth

The important of the banking sector in the development of nation economy cannot be overemphasized. This is due largely to the fact that all other sectors of the economy, be it: manufacturing, oil and gas, real estate, mining to mention but few, all depend on the banking sector for their survival (Akintola, & Adesanya, 2021). Thus, the issue of the contribution of commercial banks in Nigeria's economic growth and development is very important. Banks in developed and developing countries are expected to play vital and effective roles in financing economic projects and activities in order to ensure sustainable economic growth. Organizations and individual accesses banks credit to improve their lives. It has been transformed by the recapitalization and consolidation of banks which restructured them for better performance. Access to bank credit or financing can be said to have improved significantly in response to competition and the healthy state the nation can attain (Abdulsalam, 2013). As a result, credit availability increase will allowed manufacturing companies to increase production, become effective and efficiency in various areas of core competence that will in turn increase the profitability of banks through various services rendered from which they generate income (Adebisi , & David, et al., (2019).

The introduction of big data in developed world has eased the process of accessing credit facilities from the banks. While some studies established that financial institutions have been instrumental in accelerating economic growth, others have stated that it has not been very significant. Jatau, Ali, and Ashami, (2016) argued that the positive effect of financial institutions over economic growth can be explained by five (5) mechanisms whose operations reduce the negative impact of information irregularities among economic agents and the transaction costs involved in their activities. According to them, financial institutions provide means of payment that facilitate a greater number of transactions; concentrates the savings of a large number of savers, make possible the allocation of resources to their most productive economic use through the effective evaluation and monitoring of investment projects; and improved corporate governance and contributes to risk management.

Economic growth has long been considered as an important goal of economic policy with substantial body of research dedicated to explaining how this goal can be achieved .But such concerted efforts of researchers and polices have yielded no meaningful result . Central Bank of Nigeria in 2009 noted that flow of credit to the priority sectors fell short of prescribed targets and failed to impact positively on investment, output and domestic price level, from the foregoing, there appears to be a cause for concern (Jatau, Ali, & Ashami, 2016). Economic growth could therefore be seen as all the process of measuring the size of national economics, the macroeconomic indications, especially the GDP per capital, in an ascendant but not necessarily linear direction, with positive effects on the economic-social sector, while development shows growth impacts on the society by increasing the standard of life (Jatau, Ali, & Ashami, 2016).

There is a growing concern that commercial banks in Nigeria have not been living up to expectation in terms of service delivery, to their customers. Many people allege that these banks have abandoned their traditional banking functions in pursuit of short-term money spinning ventures like round tripping in foreign exchange, money laundering and other criminal tendencies, which are inimical to the growth of the economy. Because most of the Nigerian banks are involved in these illegal ventures, which are short term in nature and usually unstable, illegitimate and often should be check-mated by government policies, the banks themselves have become unstable, and often suffer from financial crisis and sometimes outright failure (Dalhat & Hassan, 2016).

Performance of Commercial Banks in Port Harcourt, Rivers State

Big data is the application of statistical and mathematical tool to find customers pattern in real time. Understanding the historical detail of customers will guides the employees to provides customers wanr. Descriptive analytics is capable of summarizing, describing the relationship between variables in a sample population. Banks in developed world used descriptive analytics to summaries the number of customers acquired, the possible number of transactions, areas that are doing well and the problems encountered in real time. It is a technique that reviewed customers characteristics like; names of customers, date of birth of customers, type of account opened, and amount deposited etc (Kaur, Stoitzfus, & Yellapu, 2018). Customers can only be satisfied when banks are able to meet their expectation especially in real time. The better the service quality rendered by a banks, the more customers will be satisfied and it will eventually increase the economic growth. Organizations can always do well in a good economy system.

H₀₁: Descriptive analytics does not influence customers' satisfaction of commercial banks in Rivers State, Nigeria.

H₀₂: Descriptive analytics does not influence the economic growth of commercial banks in Rivers State.

Theoretical Review

The theoretical review is the "blueprint" for the entire research inquiry. It serves as the guide on which to build and support your study, and also provides the structure to define how you will philosophically, epistemological, methodologically and analytically approach the research as a whole. Eisenhart defined a theoretical review as a structure that guides research by relying on formal theory. Theories help the researcher to see clearly the variables of the study, provide him with a framework for data analysis. It is essential in preparing a research proposal using descriptive and experimental method. This research anchored on Rough Set Theory.

Rough Set Theory

The Rough Set Theory was propounded by Zdzislaw Pawlak in 1982. Rough Set Theory is a mathematical concept that uses mathematical set theory to analyses data/information stored in a distributed database or data warehouse (Grzmala-Base, 2002). It is effective in finding solution to the various problems that exist in the database. Rough Set Theory is widely known in international workshops, conferences and seminars; currently there is an open source body of knowledge called the International Rough Set Society (IRSS) accepting contributions from different works of life (Grzymila-Busse, 2002). Rough Set Theory is applicable in others field of knowledge especially in the area of computer science and mathematics. It has relationship with fuzzy set theory and Dempster-Shafer theory of evidence. These theories are real life application of knowledge management. Other area of application of Rough Set Theory includes; Rough Control, Rough Database, Rough Information Retrieval and Rough Neural Network (Yao, 2003).

METHODOLOGY

The research design adopted in this study is the cross sectional survey design. The cross sectional survey is appropriate for an empirical study. An empirical study requires the collection of data from relevant literature and the collection of data from the respondents. Based on this, a "close-ended" structure questionnaire was design and used to collect data from the respondents. The structure questionnaire was designed based on the current trend on big data: descriptive analytics and performance of commercial banks in Port Harcourt, Rivers State. These respondents were selected from the twenty one (21) commercial banks in Rivers State using Simple Random Sampling Techniques. The data collected entails demographic researcher questions construct (variables). The demographic data helps the researcher to clarify the categories of respondents in the research. It also helps the researcher to ascertain the true categories of the population and how they affect the study focus. The cross sectional survey is appropriate for a wide range of policy decision especially in the commercial banks.

Research Population

The population for this study comprises of all the twenty one (21) Commercial Banks operating in Port Harcourt, Rivers State, Nigeria. Although the result obtained shall be used to generalize all other banks outside Rivers State. These twenty one (21) commercial banks are considered appropriate because of the possibility internet connectivity required in a real time banking system.

Sample and Sampling Size Technique

The Simple Random Sample Technique was used to select one hundred and sixty eight (168) respondents from the twenty one (21) Commercial Bank operating in Rivers State. To eliminate bias in the selection process, equal opportunities of been selected were given to each of the Commercial Banks operating in Rivers State, Port Harcourt, Nigeria.

Data Analysis Techniques

Data analysis techniques for this study utilized both descriptive and inferential tools in the assessment of the distributions, manifestations and the linear relationship between the variables of the study. The study used descriptive statistical techniques such as the frequency and percentage tools to examine the distributions for the sample characteristics (Demographic analysis). Descriptive techniques such as the mean and standard deviation were used in assessing the distribution (central tendencies and dispersion) for each variable and their manifest properties in the analysis (univariate analysis). The test for hypotheses in the study were carried out using inferential techniques (Linear Regression Analysis) for the test on bivariate relationships (bivariate analysis). The test for the hypotheses was premised on the adoption of the 0.05 level of significance, given the preference and emphasis on the 95% confidence interval in the assessment of relationships that can be described as social in nature (Sarantakos, 2005).

Analysis and Results s

The univariate analysis captured the constructs or the items of the dimension, measures and moderating variable. It indicates the number of respondents that participated in the exercise, the maximum and minimum value of Likert scale (1 to 4), the median and standard deviation. It is described as follows; Very High Extent = 4; High Extent = 3; Moderate = 2 and Lower Extent = 1. The criterion mean ($\bar{x}$) = 2.50, this is the average for a 4 - point Likert. It is the base point to ascertain levels of affirmation by the respondents (where $\bar{x} \leq 2.50$ = Low and weak level of affirmation by the respondent: where $\bar{x} > 2.50$ is substantial and adequate level of affirmation by the respondent. The standard deviations showed the closeness or dispersal from the mean. The dimension of big data analytics considered are descriptive analytics, diagnostics analytics, predictive analytics and prescriptive analytics and the measures of performance of commercial banks are customers' satisfaction and economic growth, why organizational culture was the moderating variable.

Table 1: Respondents' rate on descriptive analytics

	N	Min.	Max.	Sum	Mean ($\bar{x}$)	Std. Deviation
To what extent does your bank implement descriptive analytics to enhance employee functions	150	1.00	4.00	422.00	2.8133	.86998
To what extent does the use of descriptive analytics that helps to summarize customer's data?	150	1.00	4.00	466.00	3.1067	.85253

To what extent does descriptive analytics guide you to find the highest amount on customer's daily deposit?	150	1.00	4.00	464.00	3.0933	.88497
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To what extent are you able to identify the types of transaction; account type, account value or cash accruing to each customer?	150	1.00	4.00	454.00	3.0267	.91920
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To what extent does descriptive analytics able to review account that are dormant or customers that are likely to close their account?	150	1.00	4.00	442.00	2.9467	.95388
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Valid N (listwise)

Source: Research survey, 2022.

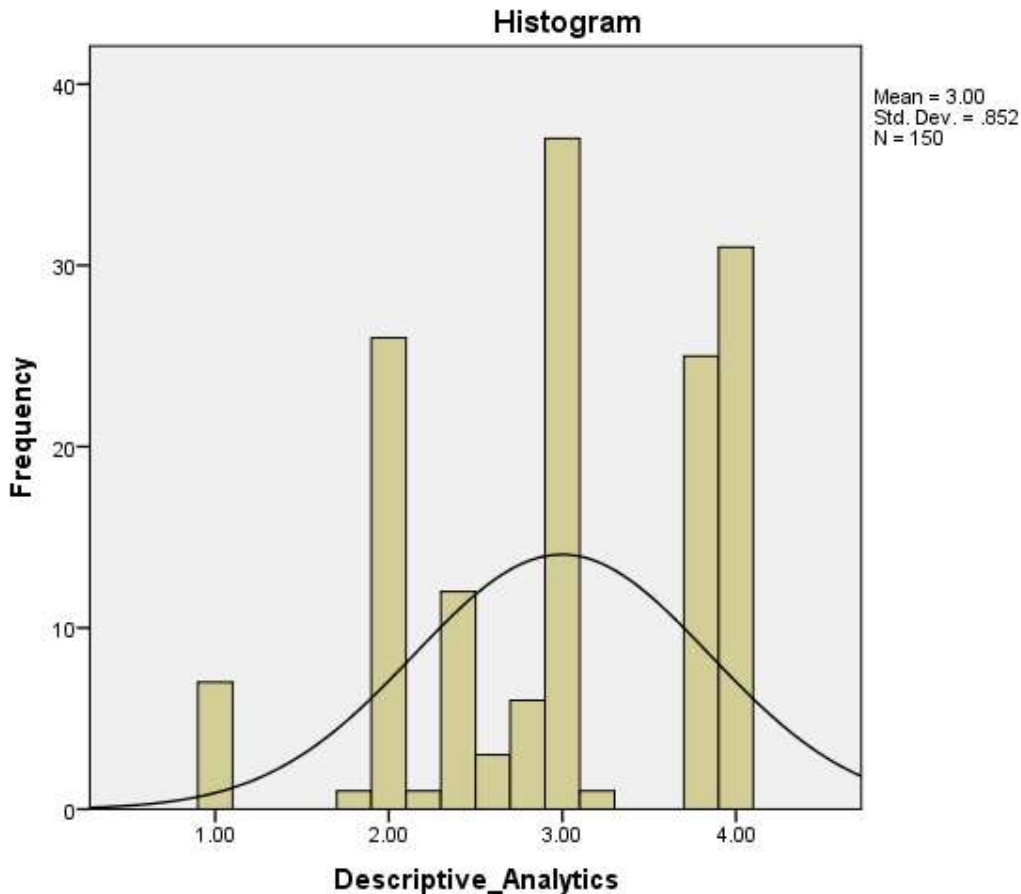


Figure 3: Histogram of Descriptive analytics

Table 1 was used to determine the manifestation of descriptive analytics as a dimension of big data analytics in which five research statements were stated in the questionnaire. It showed the total number of sample size used (N), minimum and maximum value of Likert scale, cumulated sum, the mean and standard deviation. Question one asked to what extent does respondent use descriptive analytics in commercial bank gives a mean score of 2.81 and standard deviation of 0.87, question two asked to what extent does the use of descriptive analytics helps the respondent

summarize customers data yielded a mean score of 3.11 and standard deviation of 0.85, question three asked to extent does descriptive analytics guides the respondent to find the highest deposits amount on a daily bases showed a mean score of 3.09 and standard deviation of 0.88, question four asked to what extent does descriptive analytics able to identify the types of transaction, account type, account value or cash accruing to each customers yielded a mean score of 3.03 and standard deviation of 0.92 and lastly question four asked to what extent does descriptive analytics able to review account that are dormant or customers that are likely to close their account indicated a mean score of 2.95 and standard deviation of 0.95. The various mean calculated were all above the criterion mean ($\bar{x} = 2.50$) for a 4-point Likert scale. The results also indicated a low-level disparity in the responses ($SD \leq 2.00$). This showed that all the respondents agreed on the items of descriptive analytics as appropriate and that, it is an effective tool for enhancing the performance of commercial banks in Port Harcourt, Rivers State, Nigeria.

Table 2: Respondents' rate on Customers satisfaction

Questions/Likert Scale	N	Min.	Max.	Sum	Mean ($\bar{x}$)	Std. Deviation
To what extent does your bank considered customers' satisfaction more important than just to make profit?	150	1.00	4.00	467.00	2.9133	.81771
To what extent does your bank able to provide technical efficiency to specific customers especially in critical time (when faced with problem)?	150	1.00	4.00	454.00	3.0237	.91320
To what extent does your bank able to define employee functions that will eliminate overlapping offices (functions)?	150	1.00	4.00	442.00	2.9467	.95388
To what extent does your customers appreciates the level of your service and are willing to continue with your bank?	150	1.00	4.00	501.00	3.3400	.92562
To what extent does your bank able to measure customers' satisfaction using a survey where customers' feedback can be transformed into measurable quantitative data?	150	1.00	4.00	467.00	3.1133	.84771
Valid N (listwise)	150					

Source: Research survey, 2022.

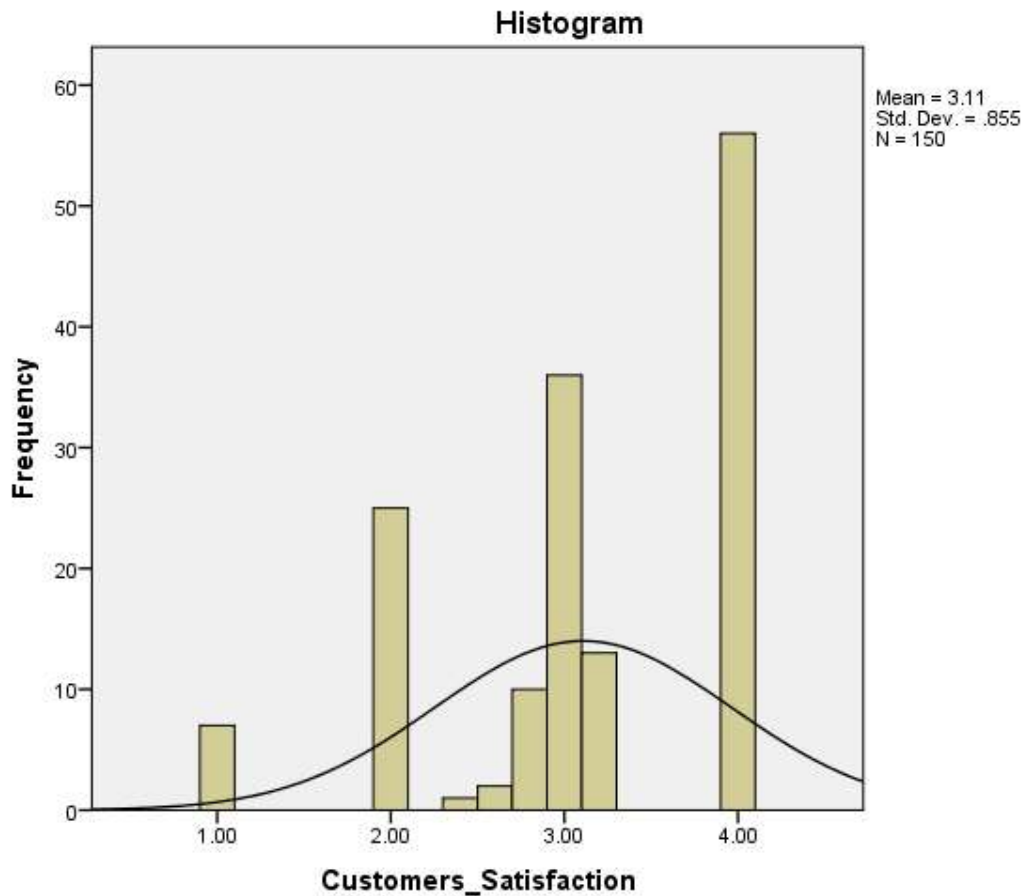


Figure 4: Histogram for customers' satisfaction

Table 4.9 was used to determine the manifestation of customers' satisfaction as a measure of performance of commercial banks in Port Harcourt, Rivers State, Nigeria in which five research statements were stated in the questionnaire. The table shows the total number of sample size used (N), minimum and maximum value of Likert scale, cumulative sum, mean and standard deviation. Question one asked to what extent do you consider your customers' satisfaction more important than just to make profit yielded a mean score of 2.91 and standard deviation of 0.82, question two asked to what extent are you able to provide technical efficiency to specific customers especially in critical time (when faced with problem) gives a mean score of 3.02 and standard deviation of 0.91, question three asked to what extent is your bank able to define employee function that will eliminate overlapping office (functions) yielded a mean of 2.95 and standard deviation of 0.95, question four asked to what extent did your customers appreciate the level of your service and are willing to continue with your bank showed a mean of 3.34 and standard deviation of 0.93 and finally, question five asked to what extent are you able to measure customers' satisfaction using a survey where customers' feedback can be transformed into measurable quantitative data yielded a mean score of 3.11 and standard deviation of 0.85. The respondents all indicated that the items were suitable for customers satisfaction, all the mean score obtained were all above the criterion mean ($\bar{x} = 2.50$) for a 4-point Likert scale. The results also indicated a low-level disparity in the responses ($SD \leq 2.00$). This shows that all the respondents agreed on the items of customers satisfaction as being appropriate and that, it is an effective tool for enhancing customers satisfaction of commercial banks in Port Harcourt, Rivers State, Nigeria.

Table 3: Respondents rate on Economic growth

Questions/Likert Scale	N	Min.	Max.	Sum	Mean ($\bar{x}$)	Std. Deviation
To what extent does your bank involve in activities that will enhance the development of other sector of the economy?	150	1.00	4.00	467.00	3.1133	.84771
To what extent does your bank able to help government in allocating resources to various productive areas of the economy based on effective evaluations and monitoring of investment project?	150	1.00	4.00	454.00	3.0267	.91920
To what extent does your bank able to formulate policies that addresses the national economics; the macroeconomic indicators, especially positive-social sector that affects the standard of living?	150	1.00	4.00	442.00	2.8367	.84388
To what extent does the bank operation focuses on retail banking which touches the masses, rather than interest in government funds (free funds) and monies from major organizations, high net worth customers?	150	1.00	4.00	467.00	3.1133	.84771
How adequate are your bank able to carry out healthy competitions that improved economic growth and enhanced corporate and individual investment in Rivers State?	150	1.00	4.00	501.00	3.3000	.92442
Valid N (listwise)	150					

Source: Research survey, 2022.

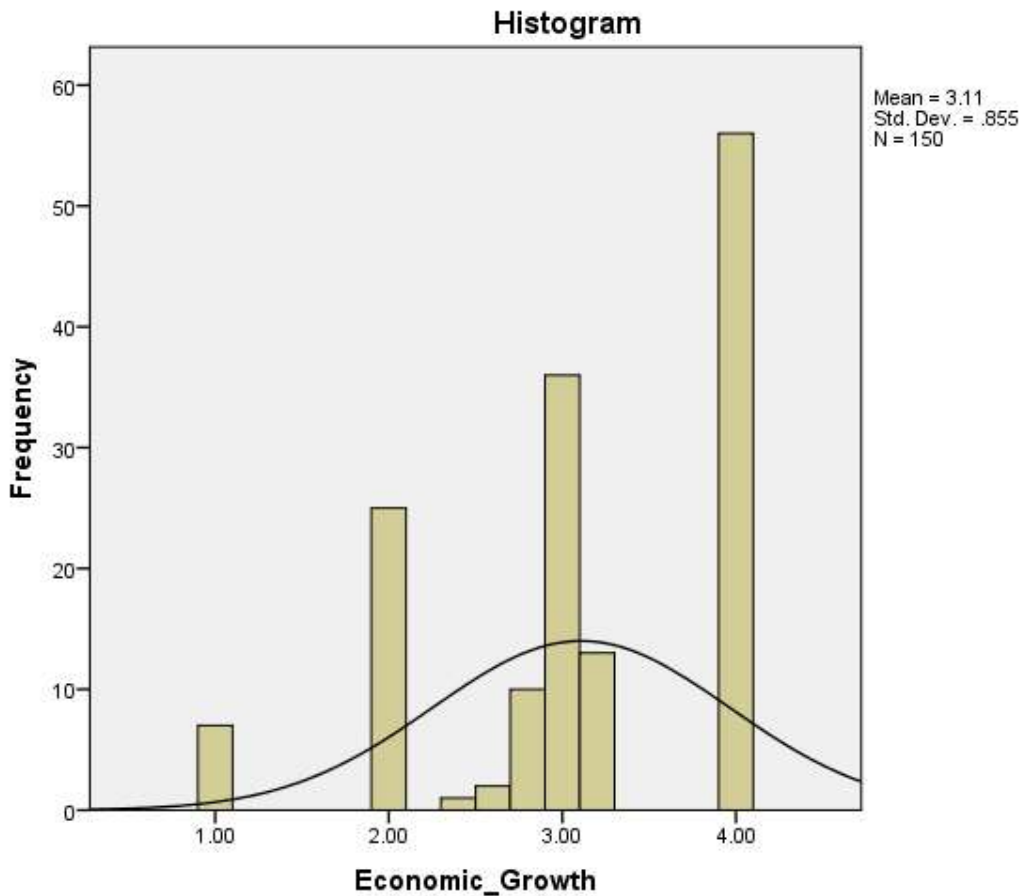


Figure 4: Histogram of Economic growth

Table 3 was used to determine the manifestation of economic growth as a measure of performance of commercial banks in Port Harcourt, Rivers State, Nigeria in which five research statements were stated in the questionnaire. The table shows the total number of sample size used (N), minimum and maximum value of Likert scale, cumulative sum, mean and standard deviation. Question one asked to what extent does respondents banks involves in activities that enhanced the development of other sector economy yielded a mean score of 3.11 and standard deviation of 0.85, question two asked to what extent is your bank able to allocate resources to various most productive economic based on effective evaluations and monitoring of investment project gives a mean score of 3.03 and standard deviation of 0.92, question three asked to what extent is your bank able to formulate policies addresses the national economics, the macroeconomic indication, especially positive-social sector that affects the standard of life yielded a mean of 2.84 and standard deviation of 0.84, question four asked to what extent does the operation of your banks are interested in retail banking which touches the masses, rather than their interest lies in government funds (free funds) and monies from big organizations, high net worth customers showed a mean of 3.11 and standard deviation of 0.85 and finally, question five asked, how adequate are your bank able to carry out healthy competition that will improve economic growth and enhance corporate and individual investment in Rivers State yielded a mean score of 3.30 and standard deviation of 0.92. The respondents all indicated that the items were suitable for economic growth, all the mean score obtained were all above the criterion mean ($\bar{x} = 2.50$) for a 4-point Likert scale. The results also indicated a low-level disparity in the responses ($SD \leq 2.00$). This shows that all the respondents

agreed on the items of economic growth as being appropriate and an effective tool for enhancing economic growth in Rivers State, Nigeria.

Bivariate Analysis

The bivariate analysis is used to determine how descriptive big data analytics dimension influence the measures of performance of commercial banks in Port Harcourt, Rivers State.

Table 4a: Model summary of descriptive analytics and Customers Satisfaction

Model	R	R Square	Adjusted Square	R Std. Error of the Estimate
1	.982 ^a	.965	.964	.16148

a. Predictors: (Constant), Descriptive analytics

Source: Research survey, 2022.

Table 4b: ANOVA of descriptive analytics and customers' satisfaction

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	104.991	1	104.991	4026.198	.000 ^b
	Residual	3.859	148	.026		
	Total	108.850	149			

a. Dependent Variable: Customers Satisfaction

b. Predictors: (Constant), Descriptive analytics

Source: Research survey, 2022.

Table 4c: Coefficients of descriptive analytics and customers' satisfaction

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.155	.048		3.202	.002
	Descriptive analytics	.985	.016	.982	63.452	.000

a. Dependent Variable: Customers satisfaction

Source: Research survey, 2022.

The model summary in table 4a showed the effect of descriptive analytics on customers satisfaction of commercial banks in Port Harcourt, Rivers State with coefficient of correlation ($R = 0.982$) and $R^2 = 0.965$ indicating 96.5% (percent) contribution of descriptive analytics to customers satisfaction. The ANOVA table 4b showed that descriptive analytics is fit as a dimension of big data analytics for predicting customers satisfaction of commercial banks in Port Harcourt, Rivers State, Nigeria with ($p = 0.000 \leq 0.05$), 95% level of freedom. Also, in the coefficient table 4c, $B = 0.985$ and ($p = 0.000 < 0.05$), 95% level of freedom. This showed that descriptive analytics significantly influenced customers' satisfaction of commercial banks in Port Harcourt, Rivers State, Nigeria.

Table 5a: Model summary of descriptive analytics and economic growth

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.972 ^a	.965	.964	.16148

a. Predictors: (Constant), Descriptive analytics

Source: Research survey, 2022.

Table b: ANOVA of descriptive analytics and economic growth

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	104.991	1	104.991	4026.198	.000 ^b
	Residual	3.859	148	.026		
	Total	108.850	149			

a. Dependent Variable: Economic growth
b. Predictors: (Constant), Descriptive analytics

Table 5c: Coefficient of descriptive analytics and economic growth

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.155	.048		3.202	.002
	Descriptive	.985	.016	.982	63.452	.000

a. Dependent Variable: Economic growth

Source: Research survey, 2022.

The model summary in table 5a showed the effect of descriptive analytics on economic growth of commercial banks in Port Harcourt, Rivers State with coefficient of correlation ($R = 0.972$) and $R^2 = 0.964$ indicating 96.54% (percent) contribution of descriptive analytics to economic growth in Port Harcourt, Rivers State. The ANOVA table 5b showed that descriptive analytics is fit as a dimension of big data analytics for predicting economic growth in Port Harcourt, Rivers State, Nigeria with ($p = 0.000 < 0.05$), 95% level of freedom. Also, in the coefficient table 5c, $B = 0.985$ and ($p = 0.000 < 0.05$), 95% level of freedom. This showed that descriptive analytics significantly aid the contribution of commercial bank banks to economic growth in Port Harcourt, Rivers State, Nigeria.

Discussion of Findings

The findings reviewed that big data: descriptive analytics positively influenced the performance of commercial banks in Rivers State, Nigeria. The results shows that the appropriate use of descriptive analytics in commercial bank will help the employees and management to easily identify customers' deposit, identify the areas where funds are in excess and allocate it to area of scarcity, appropriate use of descriptive analytics supports economic growth, proper allocation of fund to people with skills but financial handicap, it aids government to design appropriate programmes that will have positive impact on the society. It makes it easy for banks to finance individual and government project based on their historical data. The result shows that satisfied customers will be willing to continue with their banks. Big data: descriptive analytics will help the banks to provide technical efficiency to specific customers especially in critical time (even outside the normal business hour). This is because big data analytics operates in real time. This result supports the work of (Abdulsalam, 2013), credit availability increase will allowed manufacturing companies to increase production, organizations will become effective and efficiency in various areas of core competence that will in turn increase profitability of banks through various services rendered from which they generate income. This is also inline with the work of Akintola, & Adesanya, (2021) that a developed financial sector should reflect the ease of entrepreneurs with sound projects to obtain financial resources and the confidence with which investors anticipate adequate returns on investment, that in every business organizations, the customers are the key factor, without the customers, there is no business and also the work of Lynn (2002) added that service quality plays a significant role in enhancing profitability and not to just think straight to make profit without quality services, therefore, profitability is not the essential indicators banks should look after. The

better the service quality rendered by a bank, the more satisfied a customer, the more patronage and increased profit margin. This research showed that big data: descriptive analytics positively influence the performance of commercial banks.

SUMMARY

This paper surveyed concept big data: descriptive analytics and performance of commercial banks in Rivers State, Nigeria. It showed that big data: descriptive analytics is an adequate tool to improve commercial banks performance in Rivers State, Nigeria. The dimension and measures was operationalized with descriptive analytics customers' satisfaction and economic growth.

CONCLUSION

The study concluded that big data analytic significantly influenced the performance of commercial banks in Rivers State, Nigeria. The empirical review showed that other researchers emphasized on profitability of commercial bank, not minding customers' satisfaction and economic growth. Of course, it is true that you can make profit at the expense of your customers, but that profit cannot sustain the business and economic growth. This is because the customers that feel cheated will not come back, but satisfied customers will always repeat purchase. This can also generates economic boom, trust in business and other ingredients that will generate the real profit. Therefore, any business that capitalized on profit and not customers focus stands the chances of losing out completely in the near future which will directly or indirectly hampered the economic growth. Therefore this research affirmed that big data: descriptive analytics is a veritable tool for enhancing the performance of commercial banks in Rivers State, Nigeria.

RECOMMENDATIONS

Based on the findings, and the conclusions stated above, this research specifically recommends the following for commercial banks and other similar organization as follows;

- i. Implement descriptive analytics that treats customers as key to business performance
- ii. Implement descriptive analytics that is capable of investigate the historical events, find out what exactly is happening in the banks
- iii. Implement information (descriptive analytics) system that is capable of finding how customers problems/difficulties in carrying out operations outside the bank's hall.
- iv. Implement descriptive analytic tool that supports economic growth of the state.

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