BUSINESS INTELLIGENCE SYSTEM STRATEGIES AND ORGANIZATIONAL SUCCESS IN PUBLIC HOSPITALS IN RIVERS STATE, NIGERIA

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ABSTRACT: *This paper examined business intelligence System strategies and organizational success of public hospitals in Rivers State, Nigeria. The objective was to investigate the relationship between data mining, Online Analytical Processing, Querying System, Report System and organizational success of the public hospitals in Rivers State. Primary data were sourced from a sample size of two hundred and thirty four medical personnel. The test for the internal consistency of the instrument was conducted using Pearson Product Moment Correlation Coefficient (r) which yielded a reliability index of 0.89. Mean and standard deviation were used to examine the extent to which business intelligence affect performance; Spearman's rank order correlation coefficient was used to test the null hypotheses. The findings of this study found data mining, online analytical processing, querying systems and reporting systems significantly relate to the success of public hospitals in Rivers State; there is a significant relationship data mining, online analytical processing, querying systems, reporting systems and quick decision making as well as time saving, significantly moderates relationship between business intelligence systems and organizational success in public hospitals in Rivers State. The study therefore conclude that business intelligence have significant effect on performance of the hospitals. We   recommend that federal and state government should overhaul the health services and bring them into the mainstream of business intelligence scheme.*

KEYWORDS*:* Business Intelligence, Organizational Success, Public Hospitals, Processing, Querying System

INTRODUCTION

In a monopolistically competitive business environment, business operators such as entrepreneurs and government have the function of formulating policies and applying intelligence to have competitive advantage. To succeed on the market government and companies need to make right

decisions in the right time within business strategies. For the right decisions, relevant information is necessary. With the growth of importance of the information, there is a strong impact on their value, range, quality and quantity in different forms. Their processing within the required decisions must be made quickly, often in real time and usually requires some automated support. This task is carried out by business intelligence which becomes an important support tool for decision and an integral part of the daily work of managers, analysts and executives across the enterprise (Tomáš, Peter and Karol, 2016). The main objectives of business intelligence are to enable an interactive access to data, manipulation of these data and allow business managers and analysts to conduct appropriate analyses (Turban et al, 2008).

Business intelligence becomes an important part of effective business management. They are designed to improve decision of managers in enterprises. Business intelligence system is a complex task, technology and applications of information systems, which are strongly supported by analysis and planning activities of enterprises and organizations and are based on the principle of multidimensionality, which means the ability to look at the reality of several possible perspectives (Al-Ma, 2013).The need for the implementation and use of business intelligence currently derives mainly from the high demands placed on managers of enterprises. In an environment of increasingly fierce competition where business managers and analysts need to make decisions under time pressure and at the same time with high responsibility. For relevant decisions, they need to be given relevant and objective information that would be available quickly, with minimal technical complexity of handling and taking with rapidly formulate new demands for further information corresponding to the current situation of the business (Baden-Fuller and Haefliger, 2013).

Organizations survive not based on the number of resources they have decided to engage to work for them but based on how productive those resources engaged are in the course of pursuing the organizational goals. Resources that are productive are said to be efficient. Efficient material and human resources create values. Values are created by surmounting challenges and solving problems. Organizational success is the ability of an organization to attain its set goals. The ability of an organization actualizing its set goals depends on capabilities and capacity of its resources. There is a way by which the success of organization is measured. It is measured in terms of performance. Performance of an organization is measured by two factors namely, effectiveness and efficiency. In an organization where there is effectiveness and efficiency of both human and material resources, success is bound to be attained (Goh, 2013). Public hospitals in Rivers State prove to be resistant to business intelligence systems in that there is no distinct structure, facilities and equipment, business intelligence friendly environment and top management support for business intelligence. While there are various studies on business intelligence, the study of Ndubuisi-Okolo, Anekwe and Anigbogu (2017) examined the effect of strategic intelligence on business success in selected commercial banks in South-East, Nigeria. Other studies examined the effect of business intelligence on corporate performance. Therefore this study examined the effect of business intelligence system strategies and organizational success in public hospitals in Rivers State, Nigeria.

Study Variables and Conceptual Framework
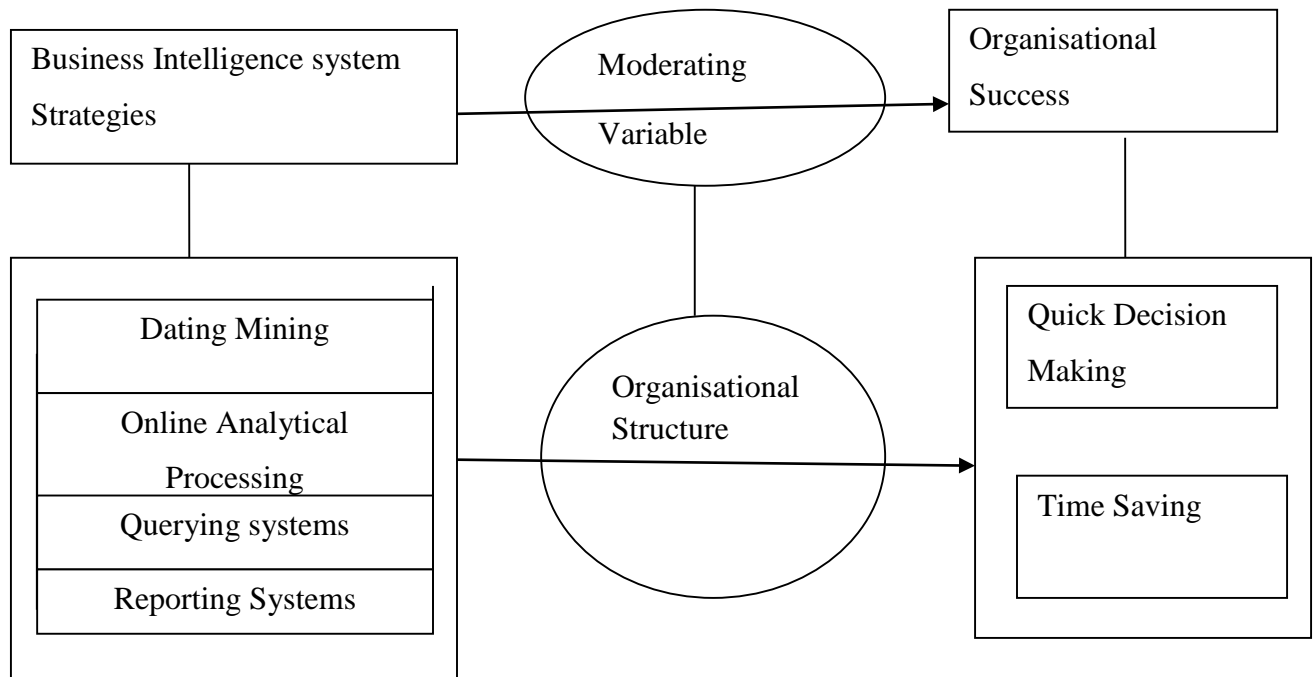
Source: Researcher Conceptualization.

LITERATURE REVIEW

Conceptual Framework

Business Intelligence

Business intelligence represents the processes, technology and tools needed to transform data into information, information into knowledge and knowledge into plans of action to promote profitable business. Business intelligence systems combine data gathering, data storage, and knowledge management with analytical tools to present complex and competitive information to planners and decision makers. Implicit in this term, the primary objective of Business intelligence systems is to improve the timeliness and quality of the input to the decision making process (Bustech, 2013). Data is treated as a corporate resource, and transformed from quantity to quality (Blome, Schoenherr and Rexhausen, 2013). Hence, actionable information could be delivered at the right time, at the right location, and in the right form to assist individual decision makers, groups, departments, divisions or even larger units (Chai, Liu And Ngai, 2013). Business intelligence presents a collection of decision support technologies for the enterprise aimed at enabling knowledge workers such as executives, managers, and analysts to make better and faster decisions (Ghattas, Soffer and Peleg, 2014). For the financial management professionals, Business intelligence success means to have a precise understanding of the relationship between operational

performance and financial results, better tools for performance management, high-quality, easily accessible historical facts for planning, forecasting, and budgeting; and better information and analytical tools for managing working capital (Guarda, Santos, Pinto, Augusto And Silva, 2013). From the business perspective, Business intelligence systems mean specific philosophy and methodology that refer to working with information and knowledge, open communication, and knowledge sharing along with the holistic and analytic approach to business processes in organizations. Business Intelligence systems are assumed to bring solutions that are responsible for transformation of data into information and knowledge, and they also create some environment for effective decision-making, strategic thinking, and acting in organizations (Olszak and Ziemba, 2006).Business Intelligence is a set of processes, applications and technologies designed to support the decision-making processes in the enterprise efficiently. Key support of the analysis and planning activities of enterprises and organizations is built on the principles of multidimensional views of business data. Business Intelligence applications cover analysis and planning functions of most areas of corporate governance; marketing, sales, purchasing, financial management, controlling, human resource management, assets, production, information system or information-communication technology and so on. In addition, Business Intelligence applications are used in other areas such as supply chain management customer relationship management corporate performance management and others (Ponelis and Britz, 2011).

Measures of Business Intelligence

This paper adopts the following as measures of business intelligence:

Data Mining

Han and Kamber (2000) maintained that the major reason data mining has attracted a great deal of attention in information industry in recent years is due to the wide availability of huge amounts of data and the imminent need for turning data into useful information and knowledge . The information and knowledge gained can be used for applications ranging from business management, production control and market to analysis, to engineering design, medical and science exploration. According to Han and Kamber (2000) data mining refers to extracting of mining knowledge from large amounts of data. The term is actually misnomer. Remember that the mining of gold from rocks or sand referred to as gold mining rather than rock or sand mining. Thus, the data mining should have more appropriately named knowledge mining from data, which is unfortunately somewhat long. Knowledge mining, a shorter term may not reflect the emphasis on mining from large amounts of data. Nevertheless, mining is a vivid term characterizing the process that finds a small set of precious nuggets from a great deal of raw material.

Online Analytical Processing System

Ranjan (2009) stressed that online analytical processing provides multidimensional, summarized views of business data and is used for reporting, analysis, modeling and planning for optimizing the business. Online analytical processing provides techniques and tools can be used to work with data warehouses or data marts designed for sophisticated enterprise intelligence systems. These systems process queries required to discover trends and analyze critical factors. Reporting software generates aggregated views of data to keep the management informed about the state of their business.

Querying System

Querying system enable the users to search conveniently for the products in databases that is critical to the organisational success. Even though data base queries are considered as the most effective method to access the product database of the organization, no significant amount of researches have enlightened the benefits of integrating database queries with organizational product searches (Agrawal et al., 2001). However, one major challenge of using database queries for organization product searches is the language gap between the specifications of the products in the databases and the keyword utilized by the people in the search queries (Vander Meer et al., 2012).

Reporting System

Reporting System is otherwise known as Database Report is a report created from a culmination of queried data visualized for the purpose of analysis, data discovery and decision making. It is the formatted result of database queries and contains useful data for decision making and analysis. Most good business applications contain a built-in reporting tool. Reporting system runs very well on a standardized spreadsheet for data collection using e-mail. Data are to be placed in a relational database management system where processed information is generated and retrieved for quick and sound decision making. Relational databases store data in tabular relations and they are managed through database management system. Several weaknesses are associated with paper reporting system.

Organizational Success

Organizational success is the ability of an organization to attain its set goals or objectives. Every organization is set to achieve certain defined goals and therefore wants to get positive results from its goal pursuance. Such positive results constitute the measure for achieving success. The success of organization is measured by the performance level of its business. The performance level of an organization is measured by two notions - effectiveness and efficiency. According to Peter Drucker (2016) effectiveness is doing the right things, while efficiency is doing things right. This therefore suggests that for an organization to be successful there must be a fusion of effectiveness and efficiency in the leadership, workforce, process, and technologies of the organization. Leadership, workforce, process, and technologies are considered to be effective and efficient if they save time, efforts and energy, reduce costs and costly risks, promote flexibility, discourage costly delays and mistakes, introduce and encourage innovations, encourage quick but accurate decision making. Organizational efficiency is a measure of the relationship between organizational inputs and outputs and in simple terms the more output we can achieve with a given amount of inputs or resources, the more efficient we are. An organization is said to efficient if it performs or functions in the best possible manner with least waste of time and effort.

Measures of Performance
Quick Decision Making

Organizations do adopt business intelligence systems to make or work tasks easy, quicken decision making, save cost, and forestall costly mistake and delays. Ranjan (2009) which found that online analytical processing, querying system is an organizational success enabler who ensures both

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effectiveness and efficiency. Effective decision making requires information that crosses organizational and functional boundaries. Business information needs Supplier/Supply Chain Information, Financial and Business Performance Information, Customer Information, Employee Information. In order to be effective in making decision the medical personal, Nurse of Public Hospital have consider, assess, and evaluate several alternatives.

Time Saving

Online Analytical Processing can generate the success public hospitals by creating an avenue for hospitals or users to look critically and objectively into items of data or information available to them, enabling hospitals to quickly identify the classes information belongs to and to place every information in the class it belongs, providing multidimensional summarized views of business data and therefore aids quick, sound, accurate and easy decisions, generating relevant and accurate readymade information for making cheap, easy, and decisions, generating total views of data to keep the hospital management informed about the state their services, and creating an avenue of accurately describing what has happened in a hospital' services over a given period of time. Others include providing the avenue for discovering accurately why something has happened in the hospital service, creating opportunities of knowing what is likely to happen in the near future in the hospital service, providing avenue of suggesting a course of actions to tackle hospital service problems urgently and comprehensively.

Theoretical Framework
The systems theory as propounded by Karl Ludwig Von Bertalanffy (1968) is the theoretical context on which this study is laid. The theory states that every organization is a system with interrelated and interdependent parts; it is defined by its boundaries and it is more than the sum of its parts. Thus, changing one part of the system affects other parts and whole system. As a system, every organization, like manufacturing industry, has various units through which it carries out its functions with a view to actualizing certain set goals; Bertalanff likened these units as parts of an organism in that any distortion or malfunction of one part of the organism affects the body of the organism as a whole. Invariably, what this theory implies is that business intelligence systems have components which work interrelated and interdependently. These components include data mining, online analytical processing, querying systems and reporting systems.

This forgoing theory is supported by another theory called innovation theory. Innovation theory by Everett Rogers (1963)states that the quest for achieving business success has been the underpinning reason for every innovative move in every organization; that is , wanting to do or trying something new by departing from old ways or departing from how that thing is previously done. For instance, paper was originally used for storing information, but innovation has bought in computers which are far better and more reliable than paper for the same purpose. The relationship between business intelligence strategies and organizational success is that the good implementation of the former will guarantee the latter.

Empirical Review

Mohmood Hemmatfar, Mahdi Salehi and Marziyeh Bayat (2010) examined competitive advantages and strategic information systems. The study stressed that knowledge management is a major factor in a competitive environment. This is because information system has a vital role in business operation and financial and non-financial aspect, such as decision-making. Cost leadership, differentiation and innovation are perceived as key indicators towards achieving a competitive advantage. It was found that strategic information system helps an organization to gain a competitive advantage through its contribution to the strategic goals of an organization and/or its ability to significantly increase performance and productivity.

Wadie Nasri and Mohamed Zarai (2013) identified key success factors for developing competitive intelligence in organization. The purpose of this paper is twofold. First, to understand Competitive Intelligence (CI) and report the process that is commonly used to create and maintain a CI program in organizations. And second, to provide key success factors in developing a functional intelligence program for an organization. The investigators present a review of the literature on CI process to collect and analyze competitive information within organizations in order to identify key success factors in developing a functional intelligence program for an organization. Five success factors can be defined as an item related to CI process: management support and understanding, focus and CI effort, location of CI function, CI personal, and product. The paper provides executive decision makers and strategic managers a better understanding of what CI process and appropriate to the decisions they must to develop a functional intelligence program for an organization.

Cartwright *et al.* (1995) surveyed seventy-four companies, which are members of the SCIP. The study examined whether a relationship exists between perceived competitive intelligence usefulness in strategic decision making and strategic orientation of the firms and specific characteristics of competitive intelligence. The study found that technical adequacy (quality) and interaction with the competitive intelligence unit are the major characteristics influencing the perceived usefulness of competitive intelligence. Project-based competitive intelligence tends to be perceived useful regardless of strategic orientation of the firm. However, continuous competitive intelligence, both comprehensive and focus, was perceived differently by firms based on their strategic orientation.

Hasan Ali Al-Zu'bi (2016) examined aspects of strategic intelligence and its role in achieving organizational agility: An empirical investigation. The study aimed to identify the strategic intelligence dimensions (Visioning, Foresight, Partnership, Intuition, and Creativity) on achieving organizational agility in the Mining and Extraction Industries sector in Jordan. A study tool was developed (questionnaire) for the purposes of collecting the primary data from the study population which consisted of (15) companies, with a total number of employees amounting to (8377) A total of (337) was chosen as a simple random representative sample of employees. The study revealed that all the strategic intelligence dimensions had an impact in achieving organizational agility, but the influence was more on dimensional creativity.

Wadie Nasri (2012) investigated the conceptual model of strategic benefits of competitive intelligence process. The purpose of this study is to explore theoretically how competitive

intelligence process influence strategic benefits expansion in organization and also to explain the process that is commonly used to create and maintain a competitive intelligence system in organizations. A review of literature on competitive intelligence within organizations is reviewed to explore their current state, tools to collect, analyze, and communicate competitive information and the strategic benefits of the competitive intelligence process. The finding revealed that organizations tend to focus on developing competitive intelligence processes which provide the organization with sustainable competitive advantage.

Carolina Schiefer (2013) researched on the role of competitive intelligence in strategic purchasing decisions and its influence on suppliers' resource allocation. The main thrust of the paper hooks on analyzing how competitor intelligence in strategic purchasing decisions affects the suppliers' resource allocation and leads to a competitive advantage. Based on an exploratory multiple-case study with ten Global Players, insights into strategic purchasing decisions and the consideration of competitor intelligence were gathered. Thus, this paper sets the first step towards theory building with respect to the use and effect of competitor intelligence in strategic purchasing. It was found that competitor intelligences imperative for strategic purchasing decisions and positively affects the decision's outcome. Surprisingly, most of the companies perceive competitors sharing the same supplier to be a threat and an opportunity at the same time. Results indicated that while competitor intelligence may slightly affect the buyer-supplier relationship per se; the assumption that competitor information leads to a better resource allocation and ultimately positively affects company's competitive advantage is widely accepted by the participants.

Mahmoud Reza Esmaeil (2014) investigated the effect of strategic intelligence on decision making and strategic planning. The present research aims to recognize not only the effective factors on the strategic intelligence, strategic decision making and strategic planning but also it studies the effect of the strategic intelligence on the strategic decision making and strategic planning in organization and companies using the intelligence system in the Khorram-abadcity. An analytical-survey research was employed. The statistical population for the research is the companies and organizations using intelligent systems in Khorram-abad which were estimated using Cochran formula of the random sampling stratification method with a sample size of 150. The research tool adopted was questionnaire which was confirmed through content validity method and its stability by Cronbach's Alpha. The structural equation approach and the AMOS 18 software were utilized to test the hypothesis. The result shows that the strategic intelligence has a positive and meaningful effect on the strategic decision making and strategic planning in the companies and organizations using the intelligent systems in Khorram-abad.

Badr, Madden and Wright (2006) examined Contribution of CI to the Strategic Decision Making Process: Empirical Study of the European Pharmaceutical Industry. The main aim of the study was to investigate the practices of competitive intelligence (CI) managers in the European pharmaceutical industry, specifically in relation to the contribution which CI made to the strategic decision making (SDM) process, regardless of firm size. CI managers in the European pharmaceutical industry were selected and the results from 79 copies of questionnaire and 14 in-depth interviews were provided. Results indicated that the CI activities in respondent firms are reasonably well established and also that the pharmaceutical industry appears to appreciate both the benefits, and requirements of a modern day CI function.

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Sabah Agha1, Eyad Atwa, Shadi Kiwan (2015) studied the impact of strategic intelligence on firm performance and the mediator role of strategic flexibility: An empirical research in biotechnology industry in Jordan, Amman. The main objective of this paper is to investigate the impact of strategic intelligence and its dimensions of (foresight, visioning, and motivation) on firm performance, and to examine the mediating role of strategic flexibility and its dimensions of (production flexibility, marketing flexibility and competitive flexibility) on such an impact in biotechnology industry firms. The statistical package for social sciences (SPSS) program and AMOS software were used to analyze and examine the hypotheses. After executing the analysis to test hypotheses; the research concluded that there are significant positive impacts of strategic intelligence on firm performance, positive impacts of strategic intelligence, on strategic flexibility, and positive impacts of strategic intelligence on firm performance in the presence of strategic flexibility as a mediator variable.

METHODOLOGY

Research Design

The research design adopted in this study is a correlative study. A correlative study is a research method where two or more variables are assessed to ascertain whether or not they have relationship with each other.

Population

The population for this study comprises two public hospitals made of 600 medical personnel from the University of Port Harcourt Teaching Hospital and Braithwaite Memorial Hospital. Both are in Rivers State.

Table i: Population size

S/No	Category of personals	No
1.	Doctors	120
2.	Nurses	120
3.	Pharmacist	120
4.	Lab Scientist	120
5.	Management Staff	120
	Total	**600**

Source: Research survey, 2018

Sample and Sampling Technique

 To determine the sample size of this study is obtained from the population size 600. To obtain an accurate samples size for this study, Krejcie and Morgan was adopted.

Table ii: Sample size distribution

S/No	Personnel	N0	Percentage
1.	Doctors	46	19.66
2.	Nurses	48	20,51
3.	Pharmacist	48	20,51
4.	Lab Scientist	46	19.66
5.	Management Staff	46	19.66
	Total	**234**	**100%**

Source: Research Survey, 2018

METHODS OF DATA COLLECTION

The basic primary sources are the respondents' biographical data and a self-structured questionnaire, while the secondary sources include relevant books, journals, paper presentations, the Internet-retrieved materials, related dissertation among others.

Instrument Development and Validity

The instrument for data collection will be a self-structured questionnaire code-named Business Intelligence System Strategies and Organizational Success Questionnaire (BISSOSQ). The instrument (BISSOSQ) will be divided into two parts. Part A will be structured to obtain information on demographic data of the respondents, while Part B will be sectionalized into five (5) with 43 items of questionnaire. Section A will comprise 10 items on the extent data mining relates to success of the public hospitals in Rivers State. Section B will comprise 9 items on the extent online analytical processing relates to success of the public hospitals in Rivers State. Section C will consist of 8 items on the extent querying system relates to success of the public hospitals in Rivers State. Section D will comprise 11 items that will seek information on the extent reporting system relates to success of the public hospitals. Section E will have 5 items dwelling on the extent organizational structure of hospital management moderates the business intelligence systems and organizational success in public hospitals in Rivers State.. The questionnaire items will be designed on a 4-point-response using the modified Likert Scale as follows: Strongly Agree (SA) = 4 points; Agree (A) = 3points; Disagree (D) = 2 points and Strongly Disagree (SD) = 1point.

Instrument of Validation

To ensure that the instrument measures what it is purported to measure; face validity established by the researcher. To carry this out, the researcher presents the instrument to the supervisor and two other experts for scrutiny in terms of its validity and conformity to the set objectives of the study. After this, the researcher incorporated their corrections, modifications and suggestions in the final draft of the instrument.

Instrument Reliability

To establish the reliability of the instrument, test-retest method was used. To conduct this exercise, the researcher administers twenty (20) copies of the questionnaire to twenty (20) respondents that are not used for the study. After the interval of two weeks, the researcher will repeat the same exercise. In order to establish the reliability index, the two sets of data emanating from the two administrations of the questionnaire will be collated and subjected to analytical computation using the Pearson Product Moment Correlation Coefficient.

Administration of Instrument

The researcher visited the hospitals personally with the help of two research assistants to administer the questionnaire to the respondents. Prior to the administration of the questionnaires, the research assistants' was duly briefed and offered instructions on how to carry out the administration 234 copies of questionnaire was administered to the respondents.

Methods of Data Analysis

The data collected was collated and presented with the use of tables. Mean and standard deviation will be used as statistical tools of analysis to answer the research questions spearman was used to test the null hypotheses .To obtain the criterion mean for scoring the questionnaire, the researcher will sum up all the above assigned points of the Likert scale model and divide them by 4 that is, $(4+3+2+1)/4 = 2.50$. Thus, the decision rule for the modified 4-Likert scale is that any mean value that stands at 2.50 and above will indicate acceptance of the item measured and any mean value below it (2.50) will indicate rejection of such an item.

Analysis and Discussion of Findings
Table iii: Distribution of questionnaire

S/No.	Category of Staff	Number Distributed	Number Retrieved	Not Retrieved	Percentage Retrieved	Percentage Not Retrieved
1	Doctors	46	43	3	19.66	1.28
2	Nurses	48	46	2	19.67	0.85
3	Pharmacist	48	35	13	14.96	5.56
4	Lab. Scientist	46	33	13	14.10	5.56
5	Management Staff	46	43	3	19.66	1.28
	Total	234	200	34	88.05	11.53

Source: Research survey, 2018

Table iii shows the distribution of questionnaire to the various categories of staff in the hospital. The questionnaires were equally distributed to the staff of the hospital. Doctors was given 46 out of which 43 was fully completed and retrieved, why 3 was not retrieved, their percentage are 19.66% and 1.28% respectively. Nurses were given 48 out of which 46 was fully completed and

retrieved why 2 was not retrieved due to some irregularity in completing the form. There percentage is 19.67% and 0.85% respectively. Pharmacist received 48 questionnaires out of which 35 questionnaires was retrieved why 13 questionnaires was not retrieved, there percentage are 14.96% and 5.56% respectively. Laboratory Scientist also was given 46 questionnaires out of which 33 were retrieved and 13 was not also retried because of inability to meet with the respondents and some wrong completion of the form. There percentage are 14.10% and 5.56% respectively and Lastly the management staff were give 46 out of which 43 questionnaire was retrieved why 3 questionnaire was not retrieved because of one error or the other. There percentage is 19.66% and 1.28% respectively. The total number of questionnaire retrieved was 200 and its percentage is 88.05% and the total number not retrieved was 34 and the percentage is 11.53%. The percentage retrieved as adequate to carry out the research study.

Table iv: Categories of staff

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Doctors	43	21.5	21.5	21.5
	Nurses	46	24.5	24.5	46.0
	Pharmacist	35	17.5	17.5	63.5
	Lab Scientist	33	15.0	15.0	78.5
	Management Staff	43	21.5	21.5	100.0
	Total	200	100.0	100.0	

Source: Research survey, 2018

Data Analysis

This sections used descriptive to determine the numbers of respondents that participated in the research, the sum, and the mean derived from the analysis, it also give the Standard Deviation of the mean

Table v: Data Mining

	N	Sum	Mean	Std. Deviation
Enabling hospitals extract the relevant information from huge amount of data for speedy, sound and accurate decision making.	200	738	3.69	1.082
Serving as an appropriate avenue of separating relevant information from irrelevant ones.	200	706	3.53	1.017
Turning data into useful information and knowledge in a cheap and quick fashion for sound decisions.	200	732	3.66	1.114
Data Miningg extracting items of that align with hospitals' needs and objectives	200	786	3.93	1.063
Valid N (listwise)	200			

Source: Research survey, 2018

Table vi: Online Analytical Processing

	N	Sum	Mean	Std. Deviation
Creating an avenue for hospitals or users to looking critically and objectively into items of data or information available to them.	200	731	3.65	1.274
Enabling hospitals or users to quickly identify the classes' information belongs to and to place information in the class it belongs.	200	669	3.35	1.298
Providing multidimensional summarized views of business data and therefore aids quick, sound, accurate and easy decisions.	200	676	3.38	1.167
Generating relevant and accurate readymade information for making cheap, easy, and decisions.	200	659	3.30	.991
Valid N (listwise)	200			

Source: Research survey, 2018

Table vii: Querying Systems

	N	Sum	Mean	Std. Deviation
Allowing hospitals or users to make requests for data or information from a database or data warehouse	200	671	3.36	1.102
Enable hospitals or users have easy access to particular information they are looking for.	200	797	3.99	1.087
Presenting a list of relevant information from which the hospitals or users make their choices quickly and accurately.	200	487	3.44	1.189
Allowing the hospitals or users in specifying the areas of interest they want to direct their requests.	200	701	3.51	1.002
Valid N (listwise)	200			

Table viii: Reporting System

	N	Sum	Mean	Std. Deviation
Enabling the hospitals to see the requested data for purpose of accurately analyzing them for good decision making.	200	666	3.33	1.228
Providing the avenue for developing programme and software applications that will suit the developed programme.	200	764	3.82	.950
Eliminating unprepared, inconsistent and late situations in the submission of hospital reports to an appropriate authority.	200	757	3.79	1.107
Replacing or supporting the paper-based reporting characterized by time wastage, huge cost and delayed decision making.	200	708	3.54	1.279
Valid N (listwise)	200			

Source: Research survey, 2018

Table ix: Quick Decision Taken

	N	Sum	Mean	Std. Deviation
Provides quick alternative and possible solutions for medical practitioners	200	698	3.49	1.272
It is fast means of carry out diagnosis and other medical activities because of its process abilities	200	774	3.87	1.029
It is quick in decision taken because of the fast means of querying huge amount of data/information from the database	200	698	3.49	1.272
The reporting system is accurate and easy to understand by the users of the system especially Doctor s and Nurses in the Hospital.	200	784	3.92	1.086
Valid N (listwise)	200			

Source: Research survey, 2019

Table x: Time Saving

	N	Sum	Mean	Std. Deviation
It generates summarized views of business data and therefore it save time that would have been used to reorganizing the information before use.	200	785	3.93	1.182
It generates summarized views of business data and therefore it save time that would have been used to reorganizing the information before use.	200	775	3.87	1.056
It is fast and save time between when the result was demand for and the time it is provided.	200	785	3.93	1.032
It enhances accurate and mining the time spends in given report about particular activities in the hospital.	200	738	3.69	1.082
Valid N (listwise)	200			

Source: Research survey, 2018

The items in the tables above indicate that most of the respondents believe to a considerable degree that business intelligence have significant effect on organizational performance. The data also revealed a low level of dispersion in terms of opinions with regards to the actual average response on the subject matter. From the analysis, it is clear that majority of the respondents agreed with the statement and thus seem to suggest that business intelligence affect performance of hospitals Rivers State.

Hypothesis testing on bivariate on the dimension and measures

Table xi: Data Mining and Quick Decision Making

Correlations

			Data Mining	Quick Decision Making
Spearman's rho	Data Mining	Correlation Coefficient	1.000	.631[**]
		Sig. (2-tailed)	.	.000
		N	200	200
	Quick Decision Making	Correlation Coefficient	.631[**]	1.000
		Sig. (2-tailed)	.000	.
		N	200	200

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Research survey, 2018

Table xi shows the Spearman's correlation coefficient; rho = 0.631** and the probability Value *(PV)* = 0.000 < 0.05 (level of significance). Accept alternate hypothesis that there is significant relationship between data mining and quick decision making.

Table xii: Data Mining and Time Saving

Correlations

			Data mining	Time Saving
Spearman's rho	Data mining	Correlation Coefficient	1.000	.456[**]
		Sig. (2-tailed)	.	.000
		N	200	200
	Time saving	Correlation Coefficient	.456[**]	1.000
		Sig. (2-tailed)	.000	.
		N	200	200

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Research survey, 2018.

Table xii shows the Spearman's correlation coefficient; rho = 0.456** and the probability Value *(PV)* = 0.000 < 0.05 (level of significance). Accept alternate hypothesis that there is significant relationship between data mining and time saving.

Table xiii Online Analytical Processing and Quick Decision   Making

Correlations			Online Analytical Processing	Quick decision making
Spearman's rho	Online Analytical Processing	Correlation Coefficient	1.000	.962[**]
		Sig. (2-tailed)	.	.000
		N	200	200
	Quick decision making	Correlation Coefficient	.962[**]	1.000
		Sig. (2-tailed)	.000	.
		N	200	200

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Research survey, 2018.

Table xiv shows the Spearman's correlation coefficient; rho = 0.962** and the probability Value *(PV)* = 0.000 < 0.05 (level of significance). Accept alternate hypothesis that there is significant relationship between online analytical processing and quick decision making.

Table xv: Online Analytical Processing and Time Saving

Correlations			Online Analytical Processing	Time saving
Spearman's rho	Online Analytical Processing	Correlation Coefficient	1.000	.693[**]
		Sig. (2-tailed)	.	.000
		N	200	200
	Time saving	Correlation Coefficient	.693[**]	1.000
		Sig. (2-tailed)	.000	.
		N	200	200

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Research survey, 2018.

Table xv shows the Spearman's correlation coefficient; rho = 0.693** and the probability Value *(PV)* = 0.000 < 0.05 (level of significance). Accept alternate hypothesis that there is significant relationship between online analytical processing and time saving.

Table xvi: Querying System and Quick Decision Making**.**

Correlations

			Querying Systems	Quick decision making
Spearman's rho	Querying System	Correlation Coefficient	1.000	.683[**]
		Sig. (2-tailed)	.	.000
		N	200	200
	Quick decision making	Correlation Coefficient	.683[**]	1.000
		Sig. (2-tailed)	.000	.
		N	200	200

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Research survey, 2018

Table xvi shows the Spearman's correlation coefficient; rho = 0.683** and the probability Value *(PV)* = 0.000 < 0.05 (level of significance). We therefore reject the Null hypothesis which says that there is no positive relationship between Querying Systems and Quick decision making in Public Hospitals in Rivers State.

Table xvii Querying System and Time Saving

Correlations

			Querying System	Time Saving
Spearman's rho	Querying System	Correlation Coefficient	1.000	1.000[**]
		Sig. (2-tailed)	.	.
		N	200	200
	Time Saving	Correlation Coefficient	1.000[**]	1.000
		Sig. (2-tailed)	.	.
		N	200	200

Source: Research survey, 2018

Table 4.16 shows the Spearman's correlation coefficient; rho = 1.000** and the probability Value *(PV)* = 0.000 < 0.05 (level of significance). We therefore reject the Null hypothesis which says that there is no positive relationship between Querying Systems and Time Saving in Hospitals in Rivers State.

Table xvii: Reporting System and Quick Decision Making

Correlations

			Reporting System	Quick decision making
Spearman's rho	Reporting System	Correlation Coefficient	1.000	.986**
		Sig. (2-tailed)	.	.000
		N	200	200
	Quick Decision Making	Correlation Coefficient	.986**	1.000
		Sig. (2-tailed)	.000	.
		N	200	200

Source: Research survey, 2018

Table xvii shows the Spearman's correlation coefficient; rho = 0.986** and the probability Value *(PV)* = 0.000 < 0.05 (level of significance). We therefore reject the Null hypothesis which says that there is no positive relationship between Reporting Systems and Quick decision making in Hospitals in Rivers State.

Table xviii: Reporting System and Time Saving

Correlations

			Reporting System	Time Saving
Spearman's rho	Reporting System	Correlation Coefficient	1.000	.692**
		Sig. (2-tailed)	.	.000
		N	200	200
	Time Saving	Correlation Coefficient	.692**	1.000
		Sig. (2-tailed)	.000	.
		N	200	200

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Research survey, 2018

Table 4.17 shows the Spearman's correlation coefficient; rho = 0.692** and the probability Value *(PV)* = 0.000 < 0.05 (level of significance). We therefore reject the Null hypothesis which says that there is no positive relationship between Reporting Systems and Time Saving in Hospitals in Rivers State.

CONCLUSION

From the emerging results herein, it could be appropriately concluded that business intelligence strategies whose components in this study have been established as data mining, online analytical processing, querying systems and reporting systems significantly relates to quick decision making as well as time saving. Organisational structure top hospital management shows the direction and evolves business intelligence culture on which an organization operates. Therefore, its actions and behaviours can instigate both business intelligence and organizational success or discourage them. The public hospitals prove to lack the touch of business intelligence in the current trend of health

tourism that characterized the Nigerian society. Health tourism reflects the act of going to abroad for obtaining health related services and as such public hospitals must be repositioned by entrenching and implementing Business Intelligence schemes to enable them compete more favorably with a lot of competitive advantages required of them.

Proper reporting enhanced quick decision making and results the cost of taking alternative decisions. This research is in line with the work of Davis & Rake (2005) that reporting system is a useful tool in decreasing adverse safety events within the health care system.

Recommendations

 Based on the findings, the following recommendations were made:

1. Federal and state governments should, as a matter of urgency, overhaul the health services and bring them into the mainstream of Business Intelligence scheme and retraining of all medical personnel in view of Business Intelligence implementation should be prioritized.

2. Special funds called Business Intelligence Health Services Integration Funds should be established for the commencement and running of Business Intelligence scheme and Legislation should be passed against health tourism by top government officials unless for exceptional designated cases so that home hospitals can be given adequate attention and make Business Intelligence Scheme succeed.
3. Software developers in Nigeria should be encouraged to produce Business Intelligence tools and solutions suitable for health services and the management of the proposed Business Intelligence Health Services Integration scheme should be by renowned BI experts.

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