DATA QUALITY MANAGEMENT AND ORGANIZATIONAL COMPETITIVENESS OF INDIGENOUS OIL/GAS COMPANIES IN SOUTH-SOUTH, NIGERIA

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ABSTRACT

The main of the study was to ascertain the relationship between data quality management and organizational competitiveness of indigenous oil/gas firms in South-South, Nigeria. The theoretical foundation for the study was laid on the knowledge based view. The study was conducted using a descriptive research design using a cross sectional survey approach. The targeted population comprised 165 principal officers of indigenous oil/gas firms in south-south, Nigeria. The study adopted a census sampling method since the population was small and manageable. Data was collected using a structured and close-ended questionnaire. Retrieved data was analyzed and results presented in tables, mean and standard deviation. The hypotheses were tested using the Spearman Rank Order of Correlation Coefficient. The findings revealed that there is a positive and significant relationship between data quality management and organizational competitiveness of indigenous oil/gas companies in south-south, Nigeria using the Pearson Product Moment Correlation tool at 95% confidence interval. Based on the findings made, it was therefore recommended that indigenous oil/gas firms should prioritize data quality management since it is integral to the competitiveness of indigenous oil/gas companies in South-South, Nigeria.

Keywords: Data Quality Management, Organizational Competitiveness, Technology Capability, Innovativeness and Responsiveness

INTRODUCTION

In today's highly competitive business environment, organizations are constantly seeking strategies to enhance their organizational competitiveness. According to Ramlall (2003), one effective strategy is to invest in human resource management (HRM) practices that foster employee engagement and development. Engaged and well-trained employees are more likely to contribute their skills and knowledge to improve organizational performance, resulting in a competitive advantage. Another strategy is to foster a culture of innovation and continuous improvement within the organization. This involves encouraging employees to generate new ideas, experiment with different approaches, and embrace change. Organizations that prioritize innovation are better equipped to adapt to market trends and customer needs, giving them a competitive edge. Additionally, organizations can enhance their competitiveness by building strong relationships with suppliers, customers, and other stakeholders. Collaborative partnerships and alliances can provide access to resources, expertise, and market opportunities that may not be readily available internally. By leveraging these relationships, organizations can strengthen their position in the market and gain a competitive advantage.

Organisational competitiveness is a crucial factor in today's dynamic business environment. It is the ability of an organization to outperform its competitors and achieve sustainable success. By focusing on key areas such as strategic planning, innovation, customer satisfaction, and continuous improvement, organizations can enhance their competitiveness and stay ahead in the market. The role of data creation in enhancing organizational competitiveness is undeniable. With the advent of advanced technologies and data analytics, companies now have the ability to collect, analyze, and leverage vast amount of data to gain a competitive edge. Data creation is an essential component of organizational competitiveness. By collecting and analyzing data effectively, organizations can better understand their customers, improve operational efficiency, and develop new products and services. Data has become the lifeblood

of modern organizations, playing a crucial role in informing decision-making, improving efficiency, and driving innovation (Binsaeed, Grigorescu, Yousaf, Radu, Nassani & Tabirca, 2023). The ability to effectively create and manage data has become essential for organizational competitiveness. As technology continues to advance and data becomes increasingly abundant, organizations must prioritize data management strategies to harness its full potential. By doing so, organizations can gain a competitive edge in today's data-driven world and position themselves for long-term success.

Data Quality Management refers to the process of ensuring that data is accurate, consistent, complete, timely, and relevant for its intended purpose. It involves a series of activities that are designed to maintain and improve the quality of data throughout its lifecycle. According to Redman and Wang, data quality is defined as "the degree to which data is fit for use by data consumers in their intended uses" (Redman and Wang, 1998). Data quality management is therefore focused on ensuring that data meets the need of its intended users, whether they are internal or external to the organization. There are several key components of data quality management, including data governance, data profiling, data cleansing, and data monitoring. Data governance involves the establishment of policies, standards, and procedures for managing data, while data profiling is the process of analyzing data to identify its quality characteristics. Data cleansing involves the correction or removal of errors and inconsistencies in data, while data monitoring involves ongoing monitoring of data to ensure that it continues to meet quality standards. Effective data quality management can provide numerous benefits to organizations, including improved decision-making, increased operational efficiency, and enhanced customer satisfaction. However, it requires a commitment to ongoing improvement and a culture of data quality within the organization. This paper therefore examined data quality management and organizational competitiveness of indigenous oil/gas companies in South-South, Nigeria.

THEORETICAL FOUNDATION

Knowledge Based Theory (KBT) posits that the primary role of the firms is the creation and application of knowledge (Spender, 1996). According to Grant (1996) the theory focuses on knowledge as a fundamental source of human productivity. The central premise of this theory is that knowledge that is largely tacit can be a source of competitive advantage. Such knowledge is difficult for competitors to imitate (Barney, 1991). This theory depicts organizations as repositions of knowledge and competences where knowledge is transformed into valuable products and services adapted to market needs to deal with competitive challenges (Kogut and Zander, 1992).

The ability of a firm to generate knowledge and effectively employ it through productive organizations determines its success and competitiveness (Drucker, 1988). Knowledge is created and held by individuals but it can become embedded within the organization as organizational processes and routines are performed repeatedly (Grant, 1996). Competitive advantage of firms arises from their superior capability in creating and transferring knowledge (Lopez and Esteves, 2013). This study holds that knowledge helps organizational employees to learn and work more effectively contributing to better organizational performance. The focus of this study is on the use of knowledge for organizational for internal purposes. As an outgrowth of the resource-based view, the knowledge-based view focuses upon knowledge as the most strategically important of the firm’s resource (Cheng, Wang & Qu, 2020). According to this view, its rationale is based on the fact that certain key decisions need to be made by the top management regarding the management of knowledge.

CONCEPT OF DATA QUALITY MANAGEMENT

Data quality is a multidimensional construct and is defined as fitness for purpose (Chapman, 2005; Gamble & Goble, 2011; Shaw & Norton, 2008). High quality data facilitates operation's decision making and planning in most industries. If data stakeholders assess the quality of data as poor, this assessment will sway their behaviours. Data Quality Management refers to the process of ensuring that data is accurate, consistent, complete, timely, and relevant for its intended purpose. It involves a series of activities that are designed to maintain and improve the quality of data throughout its lifecycle. According to Redman and Wang, data quality is defined as "the degree to which data is fit for use by data consumers in their intended uses" (Redman and Wang, 1998). Data quality management is therefore focused on ensuring that data meets the need of its intended users, whether they are internal or external to the organization.

There are several key components of data quality management, including data governance, data profiling, data cleansing, and data monitoring. Data governance involves the establishment of policies, standards, and procedures for managing data, while data profiling is the process of analyzing data to identify its quality characteristics. Data cleansing involves the correction or removal of errors and inconsistencies in data, while data monitoring involves ongoing monitoring of data to ensure that it continues to meet quality standards. Effective data quality management can provide numerous benefits to organizations, including improved decision-making, increased operational efficiency, and enhanced customer satisfaction. However, it requires a commitment to ongoing improvement and a culture of data quality within the organization. Timely availability of data is essential for successful decision-making. In order to ensure that data is available when and where it is needed, strategies must be implemented. According to Pappaioanou et al. (2003), organization-wide strategies can be implemented to ensure timely data availability. This includes improving the quality of existing data, developing a framework for decision-making, and utilizing technology for data storage, manipulation, and communication. Quality improvement initiatives should involve improving data accuracy, completeness, and clarity. Organizations should also develop a framework for decision-making that includes data collection protocols and clear processes for data analysis. Utilizing technology for data storage, manipulation, and communication is also important to ensure timely data availability. This includes the use of data warehouses, data mining, and data visualization tools. By utilizing these strategies, organizations can ensure that relevant data is available when and where it is needed to enable informed decision-making.

CONCEPT OF ORGANIZATIONAL COMPETITIVENESS

Competitiveness has also been described and understood as an attribute of a company expressed in terms of its operational effectiveness, and efficiency (Kuźmiński, Jalowiec, Maśloch, Wojtaszek & Miciuła, 2020). As for Ambastha and Momaya (2004), competitiveness is the ability of a company to design, manufacture and sell better products and services than those offered by competitors, taking into account price and non-price quality criteria in the assessment. Lisowska (2013) views the competitiveness of small and medium-sized enterprises as the ability to take quick and adequate actions to manage resources efficiently. In the case of business competitiveness, we can define it as the ability of organizations to produce goods or services with a favorable quality price ratio that guarantees good profitability while achieving customer preference over other competitors. The competitiveness of an enterprise should be understood as a proper feature of the enterprise, playing an important role in formulating the enterprise's development strategy (Ungerman, Dedkova & Gurinova, 2018; Kuźmiński et al., 2020). Competitiveness describes the extent to which the organization is aggressive in driving for its own success and goals (Jiang, Chai, Shao & Feng, 2018). Organisational competitiveness

is considered unavoidable where organizations have to advance their service features to draw in customers alongside other organizations with similar goals. That is to say, markets which have organizations vying for the attention and interest of shared customers tend to engage in competition or perceive themselves as competitors. Jacobs, Vickery and Droge (2007) opined that competitiveness ensures the relevance and survival of the organization, and within highly populated markets, requires that organizations not only advance innovations that address existing gaps, but also adopt features and structures that are engaging.

Competitiveness is considered as a relative factor and as earlier noted, is more severe in some contexts than others. Lee and Walsh (2016) affirmed that service industries are some of the most competitive; this is reflected in their advancing of technologies and processes that in most cases can be disruptive and unsettling. Competitiveness is evidently a decisive factor for survival in the business world. To achieve it requires setting priorities, which can be defined as a set of options of varying importance that a firm needs to have to compete in the market over a determined time frame (Santos, Pires & Gonçalves, 1999). Organisational competitiveness is about how companies compete in the business environment where it operates. In other words, a competitive strategy means defining how an organization plans to create and maintain a competitive edge to outsmart its competitors. Competitive strategy represents the direction of business strategies that focuses on the external business environment which relates to competitors and customers (Dadzie, Winston & Dadzie, 2012; Hitt, Ireland & Hoskisson, 2015). Strategic competitiveness is a company's long-term action plan aim at gaining competitive advantage over competitors after assessing their weaknesses, strengths, opportunities and threats in the same industry and comparing them to one's company (Farooq, 2018).

Technology Capability

In global markets, the organizations' competitive advantages result from the ability to develop new technologies more rapidly than their competitors, and to create and disseminate technological innovations (Guan & Ma, 2003). Technology is an essential valuable resource that provides sustainable competitive advantages (Caloghirou, Kastelli&Tsakanikas, 2004). It is at the center of competition in the world market. The diffusion, assimilation and further improvement of new technology determine the patterns of competition, growth and trade around the world at large (Lall, 1990). The capability to access new technology affects the ability of companies in emerging countries to build indigenous technological capabilities and compete in world markets (Lall, 1990).

Consequently, technological capability (TC) has become the focus of attention not only among academics, but also among business managers and government officials (Lall, 1990; Miyazaki, 1995; Kim, 1997). The strategic role played by technological capabilities in affecting the competitive advantage of a company, an industry, and even a country cannot be overlooked. Bergerk, Tell, Berggren, and Watson (2008) and Coombs and Bierly III (2006) sees TC comprising the system of activities, physical systems, skills and knowledge bases, managerial systems of education and reward, and values that create a special advantage for an organization. Normally, a firm is capable of operating, maintaining, adapting, and assimilating the transferred technology. The two main dimensions of TC are activities and strategies (Bergerk, Tell, Berggren, & Watson, 2008). Activities consist of R&D activity in term of patenting, product launching, and problem solving whereas strategy will consider on the technology sourcing strategy. TC plays an important role in achieving competitive advantages and increasing performance of organizations, industries, industrial clusters, and as well as for the countries. Technological capability is one of the foundations of a firm's competitive capability.

It helps firms to increase their ability to apply technical knowledge in creating and delivering innovative products that consumer may value; and thus affect the overall business performance and new product development performance of a firm (Latip, Salleh, Omar & Yaakub, 2013; Wang, Lo, Zhang & Xue, 2006).

Innovativeness

Nwinyokpugi & Brown (2022) stated that innovation is a concept with a very large applicability, whose characteristics vary based on the field of reference. Innovativeness in this case refers to provision of solutions to both routine and non-routine problems. It is the firm's ability to engage in new ideas or thinking creatively that an idea can generate future economic benefits to the firm (Hayat & Riaz, 2011). Being innovative can take many forms like welcoming new ideas, providing support for research and development and trying new product into market by use of new technology enabling the firm to gain benefits (Wiklund & Shepherd 2003). Pro-activeness is the ability to foresee before the actual occurrence of events and taking action for problems that are likely to occur in the future. Sidhu, Goubet and Xia (2016) defined innovative mindset as a way of thinking that influences the way an individual views a situation and acts upon this situation that reflects his attitude towards innovation. Innovation is a question of mindset, and creating that mindset precedes everything else. It is the innovative mindset that overrides the aspects of human nature that are often holding back innovation in an entrepreneur (Bjorling, 2016). Studies reveal that behaviour can drive a performance but a mindset is more powerful since it actually drives individual behaviour either to increase or decrease performance (Alwi, Jaaffar, Yahya., & Azami, 2018). Innovativeness reflects a firms tendency to engage in and support new ideas, novelty, experimentation and creative processes (lumpkin & Dess, 1996) that may result in new products, services, or technological processes and which may take the organization to a new paradigm of success Further, Bwisa, Kihoro and Patrick (2013) explained innovativeness as the propensity of a firm to innovate or develop new products that meet and / or exceed customers' expectations or the extent of unmet market needs as reflected in its uniqueness in comparison to similar products offered in the market. Giudici (2013) suggested that innovative practices be represented by the number of new products developed.

Responsiveness

Responsiveness refers to the extent to which firms react rapidly to changes in a business environment to seize potential opportunities (Bernardes & Hanna, 2009). This responsiveness reflects "the efficiency and effectiveness with which firms' sense, interpret, and act on market stimuli (Garrett, Covin & Slevin, 2009), and has been treated as a competitive advantage. For example, Wei and Wang (2011) proposed that this responsiveness represents a competitive marketing advantage by deploying resources to satisfy customer needs. Inman Sale, Green, Jr and Whitten (2011) noted that a firm with a high level of responsiveness outperforms its competitors in terms of operations. Inman *et al.* (2011) noted that a firm with a high level of responsiveness outperforms its competitors in terms of operations.

Scholars have conducted numerous studies to explore how organizational responsiveness can be enhanced (Wei &Wang, 2011). According to Bernardes and Hanna (2009) central to this concept of organizational responsiveness seems to be the capability to learn fast in an environment where changes are fast-paced and difficult to foresee. Accordingly, scholars have increasingly realized that to develop and maintain responsiveness, a firm must constantly learn from partners with rich experiences in terms of responding to market changes (Yu, Jacobs, Salisbury & Enns, 2013).

From the perspective of dynamic capabilities, organizational responsiveness assumes the role of adaptive capacity, which is reflected in the company's ability to reconfigure its resources and coordinate processes according to the fast-changing environment. Although some recent research has been carried out into the responsiveness of firms from the perspective of dynamic capabilities (Thongsodsang & Ussahawanitchakit, 2011), these investigations are still in their early stages and require more consistent results. What can be observed is that the perspective of dynamic capabilities is a versatile integrated theoretical approach both to the broader theories of management, such as RBV, and the more specific approaches to marketing, as in the case of market orientation (Morgan, 2012).

In dynamic and complex environments, organizational responsiveness presents itself as the adaptive capability of the company. Organizations can anticipate unexpected changes and uncertainties more rapidly when this pattern fits their strategic direction. Zhou and Li (2010) underlined this point when they referred point to strategic orientation as an important driver of the adaptive capacity of a company. Market responsiveness is a market-driven behavior of the firm and its units. Responsiveness requires some market maturity, as customers, competitors, and other relevant market actors need to be distinguished. The firm would then be able to specify a suitable degree of responsive action, such as product customization and building customer relationships (Pehrsson, 2014).

METHODS

The study population consisted of all registered and functional oil/gas companies in South-South, Nigeria, while the accessible population for the study comprised 165 principal officers of indigenous oil/gas firms in South-South, Nigeria. The researcher adopted the entire population (census) as the sample size considering the fact that the study population is not large. However, five (5) managers were drawn from each of the indigenous oil/gas companies under investigation. Preliminary investigation revealed that there are five most important managerial positions in these telecommunication firms. Specifically, the study respondents include: Administrative unit, Security, Operations Manager, Accounts unit, , and ICT Centre. In all, one hundred and sixty five (165) managers constituted the respondents for the study. The study used structured-close ended questionnaire as a means of generating primary data from the respondents of the study. The validity of the instrument was determined by the team of supervisors and other experts in measurement and evaluation studies. Reliability in this study was determined using Cronbach's Alpha technique to ensure the reliability and internal consistency of the measurement instrument. One hundred and sixty five (165) copies of structured questionnaire were administered to the respondent managers while one hundred and forty (143) copies were retrieved, cleaned and qualified for use. Measures of central tendencies and measures of dispersions were used in analyzing the respondent's demographics. More so, the simple Regression Analysis was used in testing the various hypotheses in other to ascertain the relationship between (Data quality management) and the criterion variable (Organizational competiveness). The result of the analysis revealed that there is positive strong relationship between Data quality management and organizational competiveness of indigenous oil/gas companies in South-South, Nigeria.

RESULTS

Data Quality Management and Organizational Competitiveness Measures

Table 1 shows the result of correlation matrix obtained for data quality management and organizational competiveness. Also displayed in the table is the statistical test of significance (p - value), which makes us able to answer our research question and generalize our findings to the study population.

Table 1: Correlation matrix for Data Quality Management and Organizational Competiveness

			Data Quality Management	Technology Capabilities	Innovativeness	Responsiveness
Spearman's rho	Data Quality Management	Correlation Coefficient	1.000	.956**	.978**	.969**
		Sig. (2-tailed)	.	.000	.000	.000
		N	143	143	143	143
	Technology Capabilities	Correlation Coefficient	.956**	1.000	.969**	.985**
		Sig. (2-tailed)	.000	.	.000	.000
		N	143	143	143	143
	Innovativeness	Correlation Coefficient	.978**	.969**	1.000	.979**
		Sig. (2-tailed)	.000	.000	.	.000
		N	143	143	143	143
	Responsiveness	Correlation Coefficient	.969**	.985**	.979**	1.000
		Sig. (2-tailed)	.000	.000	.000	.
		N	143	143	143	143

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

*Source: SPSS Output 2024*version 20.0

RQ1: What is the relationship between data quality management and organizational competiveness of indigenous oil and gas companies in South-South, Nigeria?

The correlation coefficient (r) result in table 1 was used to answer the research question 2 stated in the chapter one of this study. Table 1 shows a Spearman Rank Order Correlation Coefficient (r) of 0.956 on the relationship between data quality management and technology capabilities. This value implies that strong relationship exists between the variables. The direction of the relationship indicates that the correlation is positive; implying that an increase in technology capabilities was as a result of the adoption of data quality management. Therefore, there is a strong positive correlation between data quality management and technology capabilities of indigenous oil and gas companies in south-south, Nigeria.

Similarly, Table 1 shows a Spearman Rank Order Correlation Coefficient (r) of 0.978 on the relationship between data quality management and innovativeness. This value implies that a strong relationship exists between the variables. The direction of the relationship indicates that the correlation is positive; implying that an increase in innovativeness was as a result of the adoption of data quality management. Therefore, there is a strong positive correlation between data quality management and innovativeness of indigenous oil and gas companies in south-south, Nigeria.

Also, Table 1 shows a Spearman Rank Order Correlation Coefficient (r) of 0.969 on the relationship between data quality management and responsiveness. This value implies that a strong relationship exists between the variables. The direction of the relationship indicates that the correlation is positive; implying that an increase in responsiveness was as a result of the adoption of data quality management. Therefore, there is a strong positive correlation between

data quality management and responsiveness of indigenous oil and gas companies in south-south, Nigeria.

Therefore, to enable us accept or reject hypotheses 4,5 & 6 as well as generalize our findings to the study population the p- value was used as shown below:

H_{o1}:There is no significant relationship between data quality management and technology capabilities of oil and gas companies in the south-south, Nigeria

Similarly displayed in the Table 1 is the statistical test of significance (p-value) which makes possible the generalization of our findings to the study population. From the result obtained from Table 1, the sig- calculated is less than significant level ($p = 0.000 < 0.05$). Therefore, based on this finding the null hypothesis earlier stated is hereby rejected and the alternate upheld. Thus, there is a significant relationship between data quality management and technology capabilities of the oil and gas companies in the south-south region, Nigeria.

H_{o2}:There is no significant relationship between data quality management and innovativeness of indigenous oil and gas companies in south-south, Nigeria

Also displayed in the Table 1 is the statistical test of significance (p-value) which makes possible the generalization of our findings to the study population. From the result obtained from Table 1, the sig- calculated is less than significant level ($p = 0.000 < 0.05$). Therefore, based on this finding the null hypothesis earlier stated is hereby rejected and the alternate upheld. Thus, there is a significant relationship between data quality management and innovativeness of indigenous oil and gas companies in south-south, Nigeria.

H_{o3}:There is no significant relationship between data quality management and responsiveness of indigenous oil and gas companies in south-south, Nigeria

Also displayed in the Table 1 is the statistical test of significance (p-value) which makes possible the generalization of our findings to the study population. From the result obtained from Table 1, the sig- calculated is less than significant level ($p = 0.000 < 0.05$). Therefore, based on this finding the null hypothesis earlier stated is hereby rejected and the alternate upheld. Thus, there is a significant relationship between data quality management and responsiveness of indigenous oil and gas companies in south-south, Nigeria.

Therefore, the results for the first set of hypotheses with regards to the relationship between data quality management and organizational competitiveness measures are stated as follows:

i. There is a strong positive significant relationship between data quality management and organizational competitiveness of indigenous oil and gas companies in south-south, Nigeria.
ii. There is a strong positive significant relationship between data quality management and innovativeness of indigenous oil and gas companies in south-south, Nigeria.
iii. There is a strong positive significant relationship between data quality management and responsiveness of indigenous oil and gas companies in south-south, Nigeria.

DISCUSSION OF FINDINGS

The findings in Table 1 of this present study revealed that there is a strong positive significant relationship between data quality management and the measures of organizational competitiveness of indigenous oil and gas companies in South-South, Nigeria with statistical strength of .956**, .978** and .969**. This study is in agreement with previous study conducted by Hazen, Boone, Ezell, and Jones-Farmer (2017) found that data quality initiatives were positively associated with enhanced operational performance, customer satisfaction, and

overall firm competitiveness. Their research, which surveyed over 300 manufacturing firms, demonstrated that organizations with robust data quality management systems experienced improved decision-making, better supply chain integration, and increased agility in responding to market changes. Also, in a similar vein, Ramadas and Gehring (2021) conducted a longitudinal study of service firms and concluded that a strong focus on data quality led to higher customer retention rates, improved cross-selling and up-selling opportunities, and ultimately, increased profitability and market share. Their findings emphasized the role of data quality in enabling personalized customer experiences and targeted marketing efforts, which are crucial for service organizations to gain a competitive edge. Furthermore, a comprehensive meta-analysis by Kwon, Lee and Shin (2022) synthesized findings from over 50 empirical studies on data quality and organizational performance. Their research revealed a significant positive correlation between data quality practices and various measures of competitiveness, such as innovation performance, operational efficiency, and overall financial performance.

CONCLUSION

This study examined the relationship between data quality management and organizational competitiveness of indigenous oil/gas companies in South-South, Nigeria. Data quality management (predictor variable) was tested against the attributes of organizational competitiveness (criterion variable) technology capability, innovativeness and responsiveness. The hypotheses were tested using the Simple Regression Analysis. The tests were carried out at a 95% confidence interval and a 0.05 level of significance. The major findings revealed that there is positive strong relationship between data quality management and organizational competitiveness of indigenous oil/gas firms in South-South, Nigeria. Based on discussion and conclusion drawn; it was recommended that;

i. Management of indigenous oil and gas companies in south-south Nigeria should ensure data quality management are given priority as it defined data hygiene and enhances organizational competitiveness.

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