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# **Value Management and Performance in Selected Oil and Gas Companies in South-South, Nigeria**

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### **Authors' contributions**

*This study was carried out in collaboration between all authors. Author OCU designed the introduction, literature review and the first draft of the manuscript. Authors IF and SOE did the statistical analysis. All authors read and approved the final manuscript.*

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## **ABSTRACT**

Every day, employees at all organization levels in the oil and gas industry in Nigeria make decisions that affect their company's values-yet the link between these decisions and change in company value is often not made. This prompted the study to ascertain the extent of relationship that exists between Value Management and performance of these oil companies. The study specifically seeks to identify the extent to which business value contributions relate to social responsiveness of these selected oil and gas companies in South-South Nigeria. The research question and hypothesis were formulated in line with the specific objective. Survey research design was utilized for the study. Analysis of variance and simple regression analysis were used for hypothesis testing. The finding shows that there is a significant positive relationship between business value contribution and social responsiveness of these oil companies. The study identified Value Management as a critical factor in maintaining harmony in the host environment. The study recommended that the management of these oil companies should train staff on the current use of VM tools to ensure optimal performance in social responsiveness to their host communities.

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## 1. INTRODUCTION

Every day, employees at all organizational levels in the oil and gas industry in Nigeria make decisions that affect their company's values yet the link between these decisions and change in company value is often not made. Without this link, oil and gas companies cannot be sure that the decisions being made are increasing value which is the single measure of company's success [1]. These are:- a philosophy that puts value creation at the centre of operational decision making and a process that links day-to-day management with strategic objectives.

Dwindling oil prices and global recession have created new challenges and opportunities for both upstream and downstream players ride out the storm and emerge stronger. The increasing customers' demands for flexibility all at lower costs have generated a new trend in the global oil and gas industry [2].

Therefore securing a competitive edge in the current global competition is becoming increasingly difficult for these companies. Consequently many oil and gas companies in Rivers State find it difficult to live up to their social responsibility as it is becoming tough for them to catch up with the current challenges [2].

Hamidi posits that value management (VM) is one of the initiatives that many organizations have been trying to adopt to remain competitive in an increasingly intensive global market-value management is a service which maximizes the functional development from concept to completion, through the comparison and audit of all decisions against a value system determined by a client or customer [3]. Value management can also be defined as a systematic, proactive, problems solving management system that maximizes the functional value of a project by managing its development from concept stage to operation stage of the product through multidisciplinary value team [4]. For a company to be performing, it must be in a position to match its internal resources to the demands of its external environment and in particular its markets and customer expectations of increasing value creation [5]. No company is going to survive by history and build the future on historical strengths and therefore organizations need to continuously improve their performance in order to beat competition and dynamism of the business world.

There are many management approaches nowadays which can improve organizational performance but VM is different from all these because it aligns all business process to the goal of creating value. This study seeks to identify the extent to which value management relates to performance of selected oil and gas companies using Rivers State as area of study.

The oil and gas industry in Nigeria plays a vital role in the country's economic development in terms of foreign exchange government revenue and provision of employment and business opportunities. However this industry in Rivers State in the past years, has witnessed a sluggish growth. Further the profitability and investment of this industry have not increased significantly and flourishing of new business in this sector has been on the decline. The main reason for such a state of affairs of oil and gas industry seems to be linked to inability of some of these companies to create value in the environment in which they operate in. This had led to reduction in oil prices, economic sabotage by oil bunkering and destruction of pipelines by the militants in the Niger Delta. This problem has caused many oil companies in Rivers State to close up. These companies seem to lack the requisite skills on improving the business value contribution in creating value to the host communities and clients.

Pursuant to the above stated problem, the study seeks to ascertain the extent of relationship that exists between value management and performance in selected oil and gas companies by identifying the VM tool that can enhance the performance of these companies.

The general objective of the study is to identify how value management relates to performance in selected oil and gas companies in Rivers State. The study specifically seeks to ascertain how business value contribution relates to value creation in terms of social responsiveness of these selected companies in Rivers State.

### 1.1 Research Question

This research questions was formulated to guide the study;

How does business value contribution relates to value creation.

## 1.2 Hypothesis

This hypothesis was stated to guide the study:

**H<sub>a1</sub>:** There is a significant positive relationship between business value contribution and social responsiveness in selected oil and gas companies in Rivers State.

## 1.3 Scope of the Study

The study is delimited to value management and performance in selected oil and gas companies in Rivers State. Value management will be evaluated in terms of business value contribution and performance for value creation in terms of social responsiveness of the oil and gas companies. The companies selected for the study were three (3) out of twelve (12) oil and gas companies currently operating in Rivers State. The companies selected for the study were south Atlantic Petroleum (SAPETRO), Sterling Oil Exploitation & Energy Productive Nigeria Limited, Agip Energy and Natural Resources.

## 2. REVIEW OF RELATED LITERATURE

### 2.1 Conceptual Review

#### 2.1.1 Value management

The basic concept of value can be traced back to 19<sup>th</sup> century Economic Theory which pioneered the idea of residual income. However the term VM was not used until the mid 1990's by authors such as (MC Taggart, James, Peter, Knotes and Michael,) [6]. MC Taggart et al. define VM as a formal systematic approach to managing value creation and shareholder value over long time [6].

VM is also an approach to management whereby the company's overall aspirations, analytical techniques and management processes are all aligned to help the company maximize its value by focusing decision-making on the key drivers of value [7].

Value management became popular in the mid 1980's when Rapport published his seminar text, "creating shareholder value-the new standard for business performance. Value-based management theoretically involves a shift away from the use of Traditional Accounting Measures such as Earnings Per Share (EPS) and rate of Return on Equity (ROE) which are argued by the

proponents of VM to offer an unreachable guide to "shareholder value creation". Companies should adopt a number of alternative measures like Economic Value Added (EVA), Cash Flow Return on Investment (CFRO), Rate of Return on Investment (ROI) and Discounted Free Cash Flow Valuation (DCF) that are intended to provide "a calculating machine" consistent with the principles of economic income [7].

Ansoff and Sullivan have listed some of the prescriptions for optimizing profitability such as; strategic planning, back to the basics, emerging strategy, logical instrumentation, stick to knitting, return to core business and put customers first [8].

Fong, Eddie and Chenge posit that VM is a systematic process that aims to create the best value for project on the basis that the project factions must be achieved [4].

Kelly and Male view VM as a proactive, problem solving management system that maximizes the functional value of a project by managing its development from concept stage to operation state of a project through multidisciplinary value team [9].

Kelly and Male identify three elements of value-based management as [9];

1. Creating Value – how a company can increase or generate maximum future value. More or less equal to strategy.
2. Managing for Value – Governance, change management, organizational culture communication and leadership.
3. Measuring Value – Value-based management is dependent on the corporate purpose and the corporate values. The corporate purpose can either be economic (shareholder value) or can also aim at other constituents directly (stakeholder value). This study tends to focus on the stakeholder value.

#### 2.1.2 Value management life cycle

Fong et al. identify, the stages of Value Management life cycle that can accelerate the pace of performance in organizations as [4]:

1. Discovery Phase
  - a. Benchmark performance

- b. Clarify initiatives with defined success metrics communicated through a robust business case.
  - c. Ensure that executives are accountable for outcomes.
2. Realization Phase
- a. Drive project prioritization based on value throughout the implementation.
  - b. Design processes for value
  - c. Build management visibility into the project design.
3. Optimization Phase
- a. Institutionalize VM capabilities across the portfolio
  - b. Foster performance-based thinking; make success visible.
  - c. Enable management visibility and discipline

### **2.1.3 Benefits of value-based management**

- a. Can maximize value creation consistently
- b. It increase corporate transparency
- c. It helps organizations to deal with globalized and deregulated capital markets.
- d. Aligns the interests of top managers with the interests of shareholders and stakeholders.
- e. Facilitates communication with investors. Improves internal communication about the strategy.
- f. Prevents under valuation of the stock
- g. If sets clear management priorities
- h. Facilitates to improve decision making.
- i. It helps to balance short-term, middle-term and long-term trade offs
- j. Encourages value-creating investments
- k. Improves the allocation of resources
- l. Streamlines planning and budgeting
- m. It sets effective targets for compensation
- n. Facilitates the use of stocks for mergers or acquisitions
- o. Prevents turnover
- p. It helps to better manage increased complexity and greater uncertainty and risk.

### **2.1.4 Business value contribution**

In management, business value is an informal term that includes all forms of value that determine the health and well being of the firm in

the long run. Business value expands concepts of value (also known as economic profit, economic value added, and shareholder value) to include other forms of value such as employee value, customer value, societal or community value, supplier value, channel partner value, alliance partner value and managerial value. Many of these forms of values are not directly measured in monetary terms [10].

The concept of business value contribution is aligned with the theory that a firm is best viewed as a network of relationship both internal and external. These networks are sometimes called a network or value Chain [11]. Each node in the network could be a stakeholder group, a resource, an organization, end-customer, interest groups, regulators or the environment itself. In a value network, value creation is viewed as a collaborative, creative, synergistic process rather than purely mechanistic or as a result of command and control [10,11].

### **2.1.5 Components of business value**

The components of business value as listed by Sliger and Broderick, Sward, [10,11]: are;

- a. **Shareholder value:** For a publicly traded company, shareholder value is the part of its capitalization that is equity as opposed to long-term debt. One type of stock would be estimated with the number of outstanding shares times current share price. Dividends augment shareholder value while issuing of shares lower it that is stock options lower it. This shareholder value added should be compared to average/required increase in value, also known as cost of capital for private companies, the firm's value can be computed using valuation methods like discounted cash flow.
- b. **Customer value:** This is the value received by the end-customer of a good or service. These customers include a single individual or an organization with various individuals playing different roles in the buying/consumption processes. This can be measured as utility, quality, benefits and customer satisfaction.
- c. **Employee knowledge:** This is mostly undervalued and also the area where there is the most discord in reporting. Employees are the most valuable asset organizations possess.

- d. **Channel partner value:** This can be critical to a firm's functioning. It stops to exist if partner value is diminished or lost.
- e. **Supplier value:** The suppliers also add or create value for the organizations
- f. **Managerial value:** Managers should follow the principle of system value and people oriented principle.
- g. **Societal value:** The organizations should follow or adopt several values toward society or communities they carry out their operations. These social values include the provision of hospitals, schools, employment, environmental, protection and other programmes that will impact positively on the host communities. This component is one of the focuses of this study.

### 2.1.6 Social responsiveness

The European Commission defined Social Responsiveness in 2006 as a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholder on a voluntary basis [12]. Today's consumers hold companies to a high standard. Eighty-four (84%) of global consumers also said they seek out responsible products whenever possible [13]. Recognizing how important social responsibility is to their customers, many companies now focus and practice a few broad categories of corporate social responsibility (CRS). They are as stated by Post [13]:

- i. **Environment efforts:** Green energy usage eco-friendly activities.
- ii. **Philanthropy:** Donating to national and local authorities
- iii. **Ethical labour practices:** Treating employees fairly and ethically.
- iv. **Volunteering:** By doing good deeds without expecting anything in return, companies are able to express their concern for specific issues and support for certain organizations.

Social responsiveness is an organizations obligation to contribute to their community or country in a way that makes the quality of life and environment better for those around them.

### 2.1.7 Techniques of value management

The Institute of Value Management, United Kingdom views value management technique as

a combination of concepts and methods to create sustainable value for both organizations and their stakeholders. Some tools and techniques are specific to value management and others are generic tools that many organizations and individuals use. Detailed below is a list and summary of some of the main tools or techniques

- i. Brainstorming
- ii. Cost efficiency
- iii. Criteria weighting
- iv. Excursion/Metaphors
- v. Function analysis
- vi. Objectives Hierarchy
- vii. Issues Generation and Analysis
- viii. Pair wise comparison
- ix. Pareto analysis
- x. Process mapping
- xi. Risk analysis
- xii. Scamper
- xiii. Stakeholder analysis
- xiv. SWOT analysis
- xv. Value analysis
- xvi. 5 W's and H
- xvii. SMART Methodology (simple multi-attribute)
- xviii. Creative techniques

#### *2.1.7.1 Brainstorming technique*

Hamersley in Chan and Tsang are of the opinion that this technique is an idea generation technique that focuses on creating of ideas by volume (no judging). The benefits are that it allows a large volume of ideas to be generated in a short period of time. It ensures all parties are involved- no ideas are discounted initially but later, evaluation and filtering of ideas are undertaken [14].

The Steps involved are;

1. Know and understand the real criteria the company will adopt to make decisions about the resulting ideas
2. Use questions, the right ones for that matter as the platform for idea generation so that value management team will explore in small groups during a series of idea generation sessions.
3. Pick people who can answer the questions you are asking by choosing participants with first hand "In the trenches" knowledge
4. Conduct multiple, discrete, highly focused idea generation sessions among sub-groups of three to five people on different ideas rather than holding one continuous,

- rambling discussion on one idea or topic among the entire group for several hours.
5. Before dividing the participants into sub-groups on their arrival, orient them on what you expect them to accomplish and the no-go areas.
  6. Finally, ask the sub-groups to narrow their list of ideas, to a top few and then share all the leading ideas with the full group and motivates and inspire participants but a winner with the best idea or ideas should not be picked, rather notifying them on how the winning ideas will be chosen and how they will learn about the final decisions
  7. Quick follow-up activities on decisions taken should be carried out [15].

#### 2.1.7.2 Criteria weighting technique

Criteria Weighting Technique is a tool used to assist in option selection and uses functional drivers (or objectives) that are weighted for scoring options against [15].

The benefit of this technique is that it enables options selection and alternatives to be reviewed in order to support decisions being made. There are a number of different weighting techniques with varying degrees of complexity which are commonly used in value management studies. These include:

**Dots:** This is the most simplistic technique and the least scientific but can be the quickest way to assess the relative importance of a number of items by simply allocating dots to their preferred choices [16].

**Distribution of points:** This is a more statistically sound way to assign weightings by asking the team to allocate a field number of points between the items. Each person can put as many points as they wish against anyone item but must use all their points and no more [9].

**Paired comparison:** Here direct comparisons are made between each of the attributes by judging each item against the others and a three point scale designed for assessing by how much one attribute is better than another [16].

#### 2.1.7.3 Cost efficiency technique

Cost efficiency Technique is defined as a state in which the inputs and methods used to produce a

product or service results in the maximum feasible outcome. It is also the accomplishment of objectives with the lowest expenditure of resources [9].

#### 2.1.7.4 Excursion and metaphors technique

This can be described as a tool used to take delegates on an outward and return journey (possible excursion). It requires moving delegates from a problem to somewhere where creativity flourishes. The return journey often releases such creativity and ideas that would not normally be evident (Institute of Value Management). The benefit of excursion and metaphors is that it is very effective in bringing creativity to the fore front and is often used as a precursor to brainstorming [9].

#### 2.1.7.5 Function analysis technique

Function Analysis Technique is a method or technique or tool of value management for analysing the functions of the constituent parts of a project. There are many approaches to function analysis, some very structured (such as the function analysis system technique) and others less formal (such as value trees or mind maps). Functional analysis provides a very powerful tool to identify intended outcomes. In developing a functional model, the team is forced to make a very clear definition of the project by considering key questions such as:

1. What are we trying to achieve?
2. What must we get right, if we are trying to achieve it?
3. What considerations do we need to bear in mind while designing it? How do various design solutions contribute towards achieving the desired outcome?

#### (a) Function Analysis System Technique-

This is one of the approaches to function analysis, defined by the institute of value management as a technique used for identification of functions (at the heart of value management) of products, processes, projects or services and focused on client needs and wants. This technique relies on logically linking functions and allows people from different technical backgrounds to use a common language to describe and link the functions of complex systems to build a FAST (Function Analysis System Technique (Diagram. In order to produce

the FAST Diagram, the team will have to interact and communicate with one another effectively to arrive at a logical diagram that they can all understand and agree with. [17].

The benefits of function analysis system techniques are that it determines what functions are delivered i.e. what they do or must not do, not what they are (avoiding solution mode)

**(b) Value trees:** The value tree is similar to the function analysis system techniques diagram but the only difference is that in the FAST Diagram, the “how” and “why” are linked together in a logical way for the team to understand and agree with but in value tree, functions and attributes of a project normally begins on the left hand side with a statement of project objectives. The answer to the question “how” is expressed in simple value-adding attributes required to deliver the project objective. Each of these is broken down into the attributes that add value to that branch, this building a tree of decreasing abstraction from left to right, [18].

#### *2.1.7.6 Objectives hierarchy technique*

The institute of value management opines that it is a diagrammatic process for identifying objectives in a hierarchical manner and is often used in conjunction with functions. The benefit of this techniques is that it assists in focusing input where the key objectives are an the diagram is constructed in descending order.

#### *2.1.7.7 Issues generation and analysis technique*

This is a way of eliciting many issues connected with a problem or opportunity. Team members write down their issues on post-it notes and they are displayed on the wall under appropriate categories or groupings e.g. requirements, constraints, groupings, opportunities, consumptions, uncertainties, risks. The benefits of this technique are that it enables voting of the top ten important issues followed by exploration of actions to address issues [18].

#### *2.1.7.8 Pair wise comparison technique*

This technique enables ranking of items by means of comparisons between all possible pairs

of items. It enables option selection and alternatives to be reviewed in order to support decisions being made [18].

#### *2.1.7.9 Pareto analysis technique*

It is often called the 20/80 rule and aims to concentrate on the top 20 percent of items that often have biggest (often 80 percent impact), it focuses on those items or activities that can achieve the optimum.

#### *2.1.7.10 Process mapping technique*

Mold and Zulkaman are of the opinion that this technique uses flow charts to review steps in processes. It identifies processes in a diagrammatic format in a step by step manner and is often used in a manufacturing of system type processes. It is also used to identify omissions or superfluous items in the process for correction [19].

#### *2.1.7.11 Risk analysis technique*

This was defined by Kelly and Male as a structured approach to identifying risks that could affect project, product, process or service success. Here, risks are identified, evaluated (in terms of cost, time, and other impact) and robust action planning applied. It is often used in parallel with value management as there are genuine links and assist decision making or option selection [9].

#### *2.1.7.12 Scamper technique*

Scamper Technique is used as a checklist to develop ideas by applying separate verbs to choose ideas singly or together with others e.g. combine, amend etc. this technique could help with moving an idea form a creative though to a more practical use, expand on the concept behind ideas and find different ways of expressing the idea.

#### *2.1.7.13 Stakeholder analysis technique*

Stakeholder Analysis Technique identifies those key stakeholders (groups of individuals) with an influence or interest in a project, product, process or service. It can assist in following attention where the priorities are required i.e satisfaction of key stakeholder interests [18]. Stakeholders of the firm include customers, project sponsors, project team, government, suppliers, and subcontractors etc.

- (a) **Project sponsor:** Walt (2011) sees him as a stakeholder who sometimes is an executive in the organization with the authority to assign resources and enforce decisions regarding the project.
  - (b) **Customers:** are the reasons why a business was established. Their expectations in terms of prices, product quality, features and performance must be met for the organization to succeed and survive.
  - (c) **Top management:** May include the president, vice president, directors, division managers, the corporate operating committee. These people direct the strategy and development of the organization.
  - (d) **Project team:** is made up from the main departments closely related to production activities, the managers of the departments, workshop planners brainstorming on ideas for the company and making various analyses.
  - (e) **Suppliers:** are those who provide raw materials, equipment for the production activities in the organization
  - (f) **Government:** are the various government agencies like the regulatory organizations like, National Agency for Food and Drug Administration and Control (NAFDAC), Standards Organization of Nigeria (SON), tax and revenue organizations, other task force that influences or regulate the activities of the organization.
- i. Identifying the product or service which is based on usage and demand, complexity in development and future potentials.
  - ii. Understand in detail cost structure in developing and manufacturing the product.
  - iii. Define all the primary functions of the product and service through satisfying the basic needs and then taking the next step in delighting the customer.
  - iv. Shortlist alternatives through brainstorming which can provide value to the primary function of the product. Cost evaluation at high level needs to be done for all the alternatives and the cheapest alternative chosen.
  - v. Secondary functions of the product and services are studied and evaluated.
  - vi. Value analysis done has to be communicated to the various levels of the management team as to get acceptance.

#### Reasons for Value Analyzing Existing Projects:

1. It reduces costs (in all areas such as materials, parts and products) as well as improving product function thereby increasing the value of the product to the customer.
2. Reducing the costs of products increases revenue and profit per product. Therefore, giving your company the option of reducing prices to sell more or investing in research and development.
3. It enables improvements to be made to the products in a variety of areas such as design and engineering, material selection testing, manufacturing, assembling, shipping, installation etc.
4. Value analysis enables your business to take commercial advantage of the constantly falling prices of some technologies, as well as source alternative components and materials.
5. For many manufacturing businesses, their products range has evolved over time, as a collection of solutions to meet new customer needs rather than being the result of strategic planning.

#### 2.1.7.14 Value analysis technique

Value analysis Technique is a structured team based approach to identifying functional requirements of projects, products, processes or services, it aids in optimization and maximization of value to the clients or customer. The value analysis process entails.

1. Pre-Analysis which consists of activities of project selection and team selection
2. Analysis phase which consists of activities like investigation, speculation, evaluation, development and presentation of the report.
3. Post analysis phase which consists of activities' implementation of the report and regular audit [20].

Activities for value analysis by Kelly and Male include [9]:

#### 2.1.7.15 SWOT analysis technique

SWOT Analysis Technique identifies strengths, weaknesses, opportunities and threats and is also a tool used in many organizations to assist in focusing activities where required and minimize those items that can impact negatively. It consists in understanding strengths,



weaknesses, opportunities and threats that can impact on an organization, individual, product or processes [16].

- (a) **Strengths:** This describes the positive factors of a business. These are completely under the control of the business owner and he decides how to utilize them for the benefit of his company. Strengths are considered as an internal factor and include the positive attributes of a company [18]. Examples of strengths are strong finance sector, brilliant marketing team, high skilled workers etc.
- (b) **Weaknesses:** are internal factors that are within the control of the business and include the lack of technologies, lack of capital invested, in the business, unskilled labours or even the poor location of the business. [18]. A business strategy should focus less on the different areas of threat to the business and also analyze the weaknesses by coming up with ideas which improves the weaknesses but also match up with the competitors.
- (c) **Opportunities:** are external factors of the business that are beyond the control of the business but they are positive in nature. Opportunities reflect the potentials of the business and marketing strategy implemented. [21]. These open up possibilities for the business to do well if done right or taken advantage of ,the business will have a significant boost over its rivals or competitors
- (d) **Threats:** are basically the factors which may put your marketing strategy and entire business in jeopardy. It is therefore important for a company to asses the threats surrounding a business opportunity. It is an external factor which the company has no control over. Examples of threats may include bad weather, government tax regulations, rising prices from suppliers, pressure from the activist groups, bad media coverage, lawsuits that may damage the company's reputation, threats from competitors etc. [20].

#### 2.1.7.16 5W's and H technique

5W's and H Technique is defined as a technique for exploring problems which provokes further depth of questioning about the dimensions framing the problem or opportunity.

## 2.2 Theoretical Framework

This study is anchored on Porter's Value Chain Framework. Porter analyzes value creation at the firm level. Value chain analysis identified the activities of the firm and then studies the economic implications of those activities [22]. It includes four steps: (i) defining the strategic business unit (ii) identifying critical activities (iii) defining products and (iv) determining the value of an activity. The main questions that the value chain framework addresses are as follows: (i) what activities should a firm perform, and how? and (ii) what is the configuration of the firm's activities that would enable it to add value to the product and to compete in its industry. Value chain analysis explores the primary activities, which have a direct impact on value creation, and support activities which affect value only through their impact on the performance of the primary activities. Primary activities involve the creation of physical products and include inbound logistics, operations, outbound logistics, marketing and sales and service.

This theory is relevant to the study in that the oil and gas companies in Rivers State should study the economic and social activities of their company and evaluates the level of value creation to the host communities they carry out their operations in.

## 2.3 Empirical Review

These are some of the empirical studies carried out by different authors. They are reviewed below:

Mzera carried out a study on the effect of strategic value-based management on the performance of organizations in coast province, Kenya. The study was based on a survey of 70 managers of classified hotels in Mombasa and was relating the performance of these hotels to the probability of using value-based management visa vis not using value-based management through regression analysis. The findings indicated that value-based management had a significant positive relationship with the performance of the hotels [1].

Khalid, Ibrahim and Raed in their study on key performance indicators for value management in Saudi Construction Industry. A list of 55 initial performance criteria classified within three main groups have

been identified by literature and interviews with VM experts: A survey for 119 of Practitioner Engineers in Saudi Construction Industry has also been done. Their key performance indicators have been identified to play a big role in measuring the performance of value management in Saudi Industry [23].

Oane, Smolag; Marinescu and Szopa using theoretical approach studied value-based management as the innovating paradigm of contemporary governance. The findings showed that indicator systems developed under value management became irreplaceable sources of information to ensuring long-term performance [24].

Wyk and Smith studied value-based management and its application in developing value maximizing strategies at Anglo Platinum. The study adopted descriptive methodology and found out that VM ensures alignment of objectives and established a common language, standards and processes to align decisions and actions. Companies who made explicit commitments to value improvement targets improved their performance [25].

Brenda and Dina carried out a study on evolution and implementation: A study of values, business ethics and corporate social responsibility. Correlational analysis was used and the study identified the links among values, ethics and corporate social responsibility as they are incorporated into the culture and management of the two organizations studied [26].

Ezeue in a study on value management in Nigeria manufacturing companies: Challenges and prospects. The study surveyed 6000 top, middle and lower level management staff of twenty selected manufacturing companies drawn from five states in South East, Nigeria. The results showed that inadequate orientation and focus on VM principles impeded the success of VM and performance in these companies [27].

Ezigbo using primary data conducted a study on customer service and business value contribution in manufacturing companies in Nigeria. The data was analyzed with Pearson Product Moment Correlation. The findings indicated that customer service

significantly relates positively with business value contribution [28].

Wenpin and Sumantra studied social capital and value creation: The role from multiple respondents in all the business units of a large multinational electronics company. Social interaction, a manifestation of the structural dimension of social capital and trust, a manifestation of its relational dimensional, were significantly related to the extent of inter unit resource exchange, which in turn had a significant effect on product innovation [29].

Artur, Karan, Craven and Gudrun in a study on performance consequences of brand equity management: evidenced from organizations in the value chain. It was found out that organizations in the value chain performed improvably. Data was analyzed with regression analysis [30].

Mold and Zulkaman carried out a study on impact of value management on the business growth using four plastic manufactory firms. The data was analyzed with Z-test and the findings revealed that VM has influence on business growth of these firms [19].

Sakunasingha carried out an empirical study on "Value Analysis and Value Management" using 462 members and Heads of Finance and Accounts Departments of Electrical and Electronics industries of Thailand. Data was analyzed using correlation, regression and factor analysis. His findings revealed that none of the chosen organizational factors studied directly influences the use of value management tools and a significant relationship was found between organizational size and market share position but these two factors do not establish significant relationship with value management or organizational performance [31].

Paarlberg & Perry carried out a study on the topic "value management: Aligning Employee values and organizational goals. Their respondents were civilian employees and managers who have worked for over five years in Department of Defence Installation.

They used comparative case analysis to explore differences in the relationship between installation practices and social

values across high-performing and low performing units. Their findings revealed that strategic values are motivating to employees to the extent that they reflect employees internal affective, normative and task oriented values, a zone of existing values [32].

Coyne & Coyne carried out a study on Seven steps to Better Brainstorming in value management by observing 200 projects in 150 companies in industries ranging from retailing and education to banking and communications. Their experiences have helped reveal a practical approach that captures the energy typically wasted in a traditional brainstorming session and steers it in a more productive direction. The trick, they also revealed is to leverage the way people actually think and work in creative problem-solving situations [15].

Che Mat carried out a study on Value Management: An effective cost optimization technique on 215 managers in five selected construction companies in India using factorial analysis and correlation to analyse data. Findings revealed that several techniques in value management are often used to reduce cost and increase profits in construction and design projects [33].

Mold & Zulkaman examined the impact of value management on the business growth using four plastic production company. The study was guided by three research questions and descriptive survey design was adopted. The data used were collected through questionnaire and was analysed with Z-test with the aid of statistical package for social sciences (SPSS). The study reveal that value management has a significant effect on business growth of Production Company [19].

Cornel carried out a study on business value contribution and as correlate of customers satisfaction. The study was guided by one research questions; the data collected was a primary data through structural questionnaire. The data was analysed with correlation using statistical package for social sciences (SPSS version 21). The findings shows that business value contribution has a significant effect on customers satisfaction [34].

Empirical reviews showed that the studies of Khalid et al. Oane et al. Wyk and Smith, Brenda and Dina; Ezezue, Ezigbo; Wenpin and Sumantra, Artur et al. Mold and Zulkamin revealed that value management significantly improved the performance of organizations studied [23 -30,19].

The research lacuna expressly showed that the studies from other authors did not focus on business value contribution and social responsiveness of oil and gas companies in Nigeria. This study fills that gap by studying the extent of relationship that exists between value management and performance of selected oil and gas companies in Rivers State of Nigeria with specific reference to business value contribution and social responsiveness of these oil and gas companies which have never been studied in Nigerian environment.

### 3. METHODS

The study adopted survey research design. The research design enabled the study to determine the opinions of the respondents on Value Management towards the performance of oil and gas companies in Rivers State. The data collected was used in testing hypothesis and making generalization on the population based on the findings from the sample.

Primary data is the source of data for this study. The data were collected using structured questionnaire built on a five-point likert scale. Copies of questionnaire were administered to the respondents.

The total population includes all the oil and gas companies in Rivers state. The study population of two thousand, three hundred and ninety five (2395) were drawn from the total population of nine thousand, eight hundred and thirty seven (9837).

Two oil and gas companies were selected from the total of 12 operating oil and gas companies in River State.

The study relied on the table of random numbers of probabilistic sampling technique which gave each item of the population equal and independent chance of being included in the sample. Then the sample size was determined using the Taro Yamene formula. The computation is shown below:

$$n = \frac{N}{1 + N(e)^2}$$

AGIP Oil Company

$$400(1053)/2395 = 176$$

Where

n = sample size  
 N = Population size  
 e = error limit (0.05)

$$N = \frac{2395}{1 + 2395(0.05)^2} = 400$$

Bowley's proportionate allocation formula was used to determine copies of questionnaire to be distributed to each company. The computation is shown below:

$$N_h = n(n_h)/N$$

Where:

N<sub>h</sub> = number of units to be distributed to each group  
 n<sub>h</sub> = number of respondents in each group  
 n = total sample  
 N = total population

NLNG

$$N_h = 400(1342)/2395 = 224$$

The study adopted content validity where expert judges were carefully selected in the field of statistics and top management level. They were given the instrument and asked to rate the instrument independently as "strongly relevant to the construct". Then after collecting the instrument from the judges, the decision rule was applied which states that only the items in the instrument which the entire expert judges independently certify "strongly relevant to the construct" should be retained while the ones that fail this test should be dropped. This approach enabled the study to share the opinions of the experts and therefore certified this instrument fit to elicit the actual responses and measure what it is supposed to measure.

The study adopted split-halves method. A pilot study involving 30 participants was used. The responses of the participants based on the questions from the instrument were divided into two equal halves by assigning the odd numbers items to one half and even numbers items to the other half of the test.

**Table 1. Total population of oil and gas companies operating in Rivers State**

S/N	Company name	No. of employees
1	Shell Petroleum Company of Nigeria (SPDC)	1638
2	Total E and P Nigeria Limited (TEPNG)	1164
3	Nigeria Liquefied National Gas Limited (NLNG)	1342
4	Nigeria Agip Oil company (NAOC)	1053
5	Mobil Producing Nigeria Limited (MPN)	1840
6	Chevron Nigeria Limited (CNL)	2410
7	Addax Petroleum Nigeria	177
8	Nigeria Agip Energy and Natural Resources (NAE)	41
9	South Atlantic Petroleum (SAPETRO)	45
10	Statoil Nigeria Limited (SNL)	17
11	Sterling Oil Exploration and Energy Production Company Limited	81
12	Petroleum Brasileiro Nigeria Limited (PEROBRAS)	29
<b>Total</b>		<b>9837</b>

Source: Field Survey, 2017

**Table 2. Study population**

S/N	Company name	No. of employees
1	Nigeria Liquefied Natural Gas Limited (NLNG)	1342
2	Nigeria Agip Oil Company	1053
<b>Total</b>		<b>2396</b>

Source: Field Survey, 2017

**Table 3. Reliability test table**

S/N	Pre-test	Post-test	d	d <sup>2</sup>
1	30	29	2	4
2	30	29	1	1
3	29	28	1	1
4	29	28	1	1
5	30	29	1	1
6	29	27	2	4
7	30	29	1	1
8	30	28	2	4
9	30	29	1	1
10	30	29	1	1
Correlation between the two halves				19

$$r_s = 1 - \frac{6\sum d^2}{N^3 - N}$$

$$= 1 - \frac{6 \times 19^2}{30^3 - 30} = 0.91$$

Applying Spearman Brown Prophecy Formula

$$PXX'' = 2PXX' / 1 + PXX'$$

Where

PXX' = the reliability coefficient for the whole test

PXX' = the split half coefficient for the whole test

PXX' = the split half coefficient

$$= \frac{2(0.91)}{1+0.91} = 0.9$$

This certifies that the instrument is reliable

The analysis of variance and simple regression Analysis were used in testing the hypothesis to establish the level of relationship/ difference that exists between the dependent and independent variables.

### 3.1 Limitations of the Study

The study encountered some hindrances in the process of the study. These hindrances were:

1. Inability of the respondents to fill in the questionnaire but this problem was mitigated by visiting them during break-time.

2. Refusal by the respondents to reveal any information because of fear of militants in the area but the limitation was mitigated by educating and convincing them the reason for carrying out the study

## 4. DATA PRESENTATION AND ANALYSIS

Out of 400 copies of questionnaire distributed, 354 returned the copies of questionnaire showing 88.5% response rate.

### 4.1 Demographic Profile of the Respondents

The Table 4 of age of distribution above who participated in the study revealed that those between the ages of 18-30 are 7 (2percent), those between the ages of 31-50 are 231 (65.2percent), those in age bracket 51-66 are 92 (26percent) while ages 66 and above are 24 (6.8percent).

The sex distribution in Table 5 showed that 317 (89.5percent) of the participants are males while 37 (10.5 percent) are females. It is clear that the males dominate in the companies.

In the analysis of research questions, it showed the respondents mean values are more than 3 each of the decision value. This reveals that a business value contribution is one of the indicators of social responsiveness. This is supported by Ezezue (2015) in a study carried out on value management in Nigerian manufacturing companies that inadequate orientation and focus on VM principles impede the success and performance of companies.

**Table 4. Age of the respondents**

Age	Frequency	Percent	Valid percent	Cumulative percent
18-30	7	2.0	2.0	2.0
31-50	231	65.2	65.2	67.2
51-66	92	26.0	26.0	93.2
66 and above	24	6.8	6.8	100.00
Total	354	6	100.0	

Source: Field Survey, 2017

**Table 5. Sex distribution of the respondents**

Age	Frequency	Percent	Valid percent	Cumulative percent
Male	317	89.5	89.5	89.5
Female	37	10.5	10.5	10.5
Total	354	100.0	100.0	

Source: Field Survey, 2017

**Table 6. Analysis of research question**

S/N	Question	Mean	Standard deviation	N
<b>Business value contribution</b>				
1	My organization reacts quickly to clients where there are complaints	4.48	.991	354
2	My company embarks on production process that reduces cost of production	4.41	1.029	354
3	The departments in my company work towards generating ideas that will add value to our business	4.54	1.126	354
4	My company makes use of standard equipment in production processes in order to produce durable products	4.88	.522	354
5	We work in teams to ensure that we add value to our production process and output	4.14	.556	354
<b>Social Responsiveness</b>				
6	My company responds promptly to community agitations on their social needs	4.23	.847	354
7	My company explores any available means to control gas flaring in the host communities	4.71	.854	354
8	Management of my organizations gives employment opportunities to the host communities.	4.62	.972	354
9	My company builds infrastructure like hospitals, schools, roads in the host communities	4.87	.474	354
10	We do not wait for youth restiveness before we provide them with social amenities	4.70	.793	354

#### 4.2 Hypothesis Testing

There is a significant positive relationship between business value contribution and social responsiveness of selected oil and gas companies in Rivers state.

Table 5 result above reveals that f-calculated value of 133.349 is greater than f-critical table value of 3.85 at 0.05 level of significance and at 1 degree of freedom. Null hypothesis is rejected and alternate hypothesis accepted which states that there is a significant positive relationship

between business value contribution and social responsiveness of these companies.

Table 6 is the model summary. It shows how much of the variance in the social responsiveness of these companies that is explained by business value contributions. In this case, the R-square value of .275 and an Adjusted R-square value of .273 means business value contributions explains 27.3% variance in social responsiveness of these oil companies in Rivers State.

**Table 7. ANOVA table for simple regression result for the hypothesis**

Model	Sum of squares	df	Mean square	f	Sig
Regression	191.073	1	191.073	133.349	.000 <sup>b</sup>
Residual	504.373	352	1.433		
Total	695.446	353			

Source: Field Survey, 2017

**Table 8. Model summary for test of the hypothesis**

Model	R	R-square	Adjusted R-square	S.E of estimate
1	.524 <sup>a</sup>	.275	.273	1.197

Source: Field survey, 2017

## 5. DISCUSSION OF FINDINGS

The finding from the hypothesis supports the views of Mzara, Khalid et al. Oane et al. Wyk and Smith, Brenda and Dina; Ezezue; Ezigbo; Wen Pin and Sumentra; Artur et al. Mold and Zuikaman [1,23-30,19]. The authors' findings support the study's findings that Value Management significantly relates to performance of these selected Oil and Gas companies in Rivers State significantly.

The findings revealed that the calculated value of 133.349 is greater than the critical table value of 3.85 at 0.05 level of significance and 1 degree of freedom. Alternative hypothesis was accepted. The results revealed that R-square value of .275 and an Adjusted R-square value of .273 means business value contribution explains 27.3% variance in social responsiveness of these oil companies.

This supported the view of Ezezue that inadequate orientation and focus on VM principles will impede the success of VM and performance of oil and gas companies in South-South Nigeria [27]. The finding also explained the views of Brenda and Dina that there is link among values, ethics and corporate social responsibility as they are incorporated into the culture and management of organizations [26]. Oane et al. confirmed the finding that indicator systems developed under value management have been identified to play a big role in measuring the performance of value management [24].

## 6. CONCLUSION

Identifying the extent to which business value contributes to creating value in terms of social responsiveness helps the oil and gas companies to evaluate VM for optimal performance. Value management plays a very big role in maintaining harmony in the host environment.

The oil and gas industry in the South-South Nigeria in the past years has witnessed a sluggish growth. The profitability and investment of this industry have not increased significantly and flourishing on the decline. The main reason for such a state of affairs of this industry seems to be linked to inability of some of these companies to create value in the environment in which they operate in. The oil companies need the requisite skills on improving the business value contribution in creating value to the host communities and clients.

## 7. RECOMMENDATIONS

Based on the findings, the following policy recommendations were made:

1. The oil and gas companies in Rivers State should vigorously implement value-based management techniques so as to improve performance in every area of their organization.
2. The companies should realign the value management strategies with maintaining social harmony in the environment
3. Managers ought to train staff on the use of VBM tools and techniques in order to be able to measure their performance on social responsiveness to their host communities.

## 8. SUGGESTION FOR FURTHER STUDIES

Other researchers can carry out a study on value management and performance in other industries in the South-South Nigeria.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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**APPENDIX 1**

**Table 1. Sample of the questionnaire distributed to the respondents**

S/N	Question	Strongly agree	Agree	Undecided	Strongly disagree	Disagree
1	My organization reacts quickly to clients where there are complaints					
2	My company embarks on production process that reduces cost of production					
3	The departments in my company work towards generating ideas that will add value to our business					
4	My company makes use of standard equipment in production processes in order to produce durable products					
5	We work in teams to ensure that we add value to our production process and output					
6	My company responds promptly to community agitations on their social needs					
7	My company explores any available means to control gas flaring in the host communities					
8	Management of my organizations gives employment opportunities to the host communities.					
9	My company builds infrastructure like hospitals, schools, roads in the host communities					
10	We do not wait for youth restiveness before we provide them with social amenities					

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