

## Virtual Leadership and Organizational Efficiency of Multinational Oil and Gas Companies in Nigeria

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### Abstract

This study examined the relationship between virtual leadership and efficiency of multinational oil and gas companies in Nigeria. The study adopted the cross-sectional survey in its investigation of the variables. Primary source of data was generated through structured questionnaire. The population of study was the five (5) multinational oil and gas companies in Nigeria with the entire population adopted as census. However, the respondents/ participants in the study were fifty managers of the five (5) multinational oil and gas companies in Nigeria. The reliability of the instrument was achieved by the use of the Cronbach Alpha coefficient with all the items scoring above 0.70. The hypotheses were tested using the Spearman's Rank Order Correlation Coefficient. The tests were carried out at a 0.05 significance level. Findings from the study revealed that there is a significant positive relationship between virtual leadership and efficiency of multinational oil and gas companies in Nigeria. Therefore, the study concludes that as multinational companies use virtual leadership, their level of time minimization, cost minimization and waste minimization are positively enhanced. Hence, the study therefore recommends that

**Keywords:** *Virtual Leadership, Efficiency, Time Minimization, Waste Minimization, Cost Minimization*

### Introduction

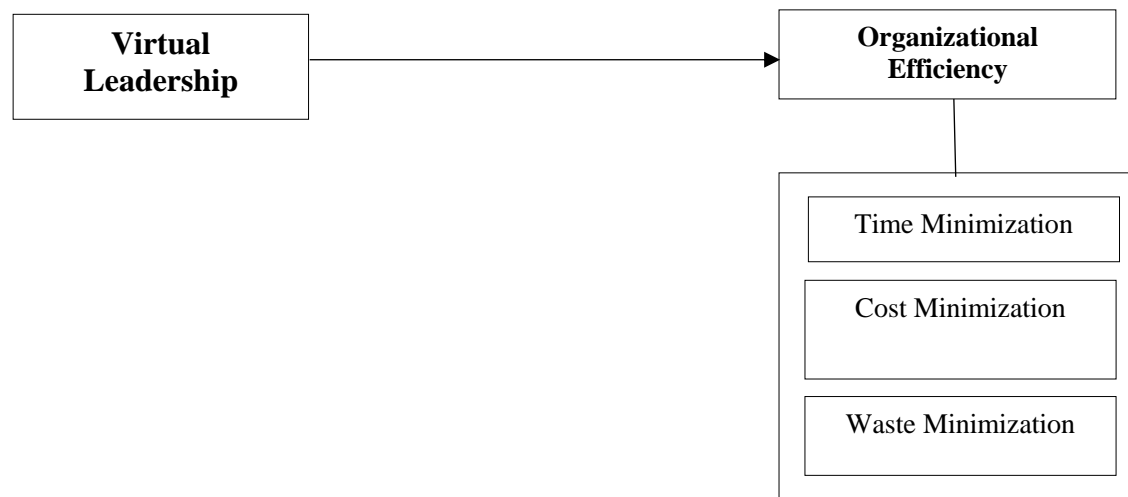
Corporate efficiency refers to the record of achievements made by an organization (a corporation) at, or over a given, time measurable through several indices. It is measured by the extent to which an organization achieves set objectives or executes its strategies; hence efficiency measures are sourced from both corporate objectives and strategies (Zeb-Obipi, 2015). According to Tangen (2005), efficiency can be described as an umbrella term for all concepts that consider the success of a firm and its activities. Efficiency refers to actual results or outputs of certain activity, how an activity is carried out, or an ability to achieve results. Atkinson (2012) defined efficiency as the achievement of results ensuring the delivery of desirable outcomes for a firm's stakeholders. Awino (2011) asserts that for an organization to be successful it has to record high returns and identify efficiency drivers from the top to the bottom of the organization. Njihia, Obara and Mauti (2013) highlight efficiency measurement as one of the tools which help firms in monitoring efficiency, identifying the areas that need attention, enhancing motivation, improving communication and strengthening accountability. Efficiency is equivalent to the famous 3Es, that is, economy, efficiency, and effectiveness of a certain program or activity (Javier, 2007). Daft (2010) defined efficiency as the organization's ability to attain its goals by using resources in an efficient and effective manner. Similarly, Sok, O'Cass and Sok (2013) argue that efficiency is the ability of the organization to achieve its goals and objectives.

Increased globalization and fluidity of boundaries driven by the advent of technological advances has altered the economic definition of borders and distances (Audretsch, 2007). In the present age commonly referred to as the knowledge age, organisations are increasingly witnessing dynamic environments with change and evolution amongst the challenging contexts. Organisations are making every effort to achieve economic supremacy in addition to their endeavour to remain competitive in the global market through increased efficiencies and lean production (Forghani & Tavasoli, 2017). The advent of technology has availed unlimited sources of knowledge to practitioners and academia with pundits signalling the dawn of the knowledge age supplanting the industrial era. This trend has ushered in the virtual organization. Virtual organisations allow teams to stay flexible and to position themselves for success in an environment where competition is very high (Mwaniki, 2014). Organisations benefit immensely from the adoption of virtual offices as they are able to source talent from different geographical locations, minimize travel costs in addition to saving the organization expenditure on office space which has been seen to be on the rise especially in the Kenyan market. Given that organisations are growing geographically and engaging in diverse businesses and alliances, the adoption of virtual offices could be deemed inevitable (Larson, Leung & Mullane, 2017).

Many organisations are now benefiting from harnessing virtual work to increase productivity, efficiency, quality, and reduction in reliance on labour force skills, to give more strength to service strategies and approaches in contemporary industrial workforce. Obviously, the application of modern technology has made it possible to redefine where work is done (Davenport & Pearlson, 1998). A company’s workforce has always been its most valuable asset and normally its biggest expense. Attracting and retaining the right talent continues to be a foremost concern for managers. Today, however, many workforce operate in a virtual environment. The proliferation of the virtual team has had a significant impact on managers, who must reconsider traditional management strategies on how to communicate and collaborate effectively, for example in light of the characteristics of remote teams, whose members live in different time zones, rarely or never see one another in person, and communicate primarily via electronic mediums. The need for companies adopting virtual work has been heightened by the outbreak of the novel coronavirus termed COVID-19. The purpose of this paper therefore was to examine the relationship between virtual leadership and organizational efficiency of multinational oil and gas companies in Nigeria. The specific objectives of the study included:

- i. Examine the relationship between virtual leadership and time minimization of multinational oil and gas companies in Nigeria.
- ii. Examine the relationship between virtual leadership and cost minimization of multinational oil and gas companies in Nigeria.
- iii. Examine the relationship between virtual leadership and waste minimization of multinational oil and gas companies in Nigeria.

### Conceptual Framework



**Figure 1:** Conceptual model for the relationship between virtual leadership and organizational efficiency  
**Source:** Researcher (2021)

## **Theoretical Foundation**

### **Resource-Based View Theory**

Resource-Based View (RBV) is an approach that emerged in 1980 to 1990 which is traceable to the major works published such as the Resource-Based view of the firm by Wernerfelt, the Core competency of the Corporation by Prahalad and Hamel, and Firm Resources and Sustained Competitive Advantage by Barney. The approach was later formalised by Barney in 1991. Resource-Based View is an approach that states that sustainable competitive advantage can be attained provided a firm engages in development of resources and capacities that remain valuable, rare, inimitable, and not substitutable. The proponents of this new view argue that organizations should analyse their internal environment to find the sources of competitive advantage instead of dwelling much in x-raying competitive environment forces. This theory was formalised by Barney in 1991.

Organizational resources, according to Barney, (1991), can be classified into three major areas: physical capital resources, human capital resources, and organizational capital resources. Physical capital resources available for firm, according to Barney, include physical technology, plant and equipment, geographic location, and raw materials accessibility. The human capital resources include competences of individual managers and workers in a firm. The organisational capital resources include a firm's formal reporting structure, its formal and informal management systems, as well as informal relation among groups within a firm, between a firm and those in its environment.

### **The Concept Virtual Leadership**

The existing literature agrees that leadership in virtual teams is important and managers play a central role in virtual team functioning (Gilson, Maynard, Jones, Young, Vartiainen & Hakonen, 2015; Martins & MacDonnell, 2012). According to the majority of the current scholars (e.g. Kelley and Kelloway, 2012; Jonsen, Maznevski, & Davison, 2012; Siebrat, 2009; Zander, Mockaitis & Butler, 2012), virtual work creates new and greater managerial challenges and forms a new context for leadership and management; managers cannot lead virtually as they would in face-to-face situations. Similarly, also using the term e-leadership, prior research (Avolio, Sosik, Kahai, & Baker 2014) has found that communication technology affects the leadership dynamic and virtual contexts make leadership different from leadership in traditional physical contexts; it is more complex than traditional leadership and thus requires different mindsets, behaviors, and strategies (Colfax, Santos, Diego, 2009; Kahai, Huang, & Jestic, 2012; Wakefield et al., 2008). In addition, as they often work in matrix organizations, members of global virtual teams are likely to represent different specialist functions and have multiple reporting lines. This means leadership is potentially more difficult because it requires collaboration, co-operation, coordination, and commitment with a team that does not report directly to the manager.

### **The Concept of Organizational Efficiency**

The management of many firms are faced with the challenge to improve their efficiency and deal with the changing competitive arena (Waithaka, 2016). Firms have an important role in our daily lives, and successful firms are a key ingredient for developing nations like Nigeria. Academics and practitioners endeavor to understand and explain the differences in firm efficiency in the face of the complexity of the market, competitive pressures and uncertainties. Firms must be able to cope with the increasingly number of challenges from the business environment, in order to increase their ability to adapt (Gavrea, Ilies & Stegorean, 2011). The concept of efficiency of a business firm is based upon the idea that an organization is the voluntary association of productive assets, including human, physical, and capital resources, for the purpose of achieving a shared purpose (Alchian & Demsetz, 1972; Carton, 2004).

Firm efficiency is one of the most relevant constructs in the field of strategic management; a construct commonly used as the final dependent variable in various fields (Cho & Pucik, 2005; Richard, Derinney, Yip, & Johnson 2009). It is believed that the essence of efficiency is the creation of value, therefore, value creation, as defined by the resource provider, is the essential overall efficiency criteria for any organization (Monday, et al., 2015). Continuous efficiency is the focus of any organization because only through efficiency are organisations able to grow and survive (Gavrea, Ilies & Stegorean, 2011). A business organization could measure its efficiency using the financial and non-financial measures.

The concept of firm efficiency has been viewed by different authors from various perspectives, and consequently there is no consensus on a particular definition. Hence, it has been variously defined by various authors. According to Olabisi, Olagbemi and Atere (2013) firm's efficiency is complex, and is characterized by the firm's ability to create acceptable outcomes and actions. According to Adeleke, Ogundele and Oyenuga (2008), a firm is said to achieve an effective efficiency if it makes use of its resources to attain high level of efficiency. They also affirm that a business firm is effective if it attains its sales or market share goals which depend on efficiency. Moullin (2003) as cited in Wu (2009) defines firm efficiency in terms of how well an organization is managed and the value the organization delivers to customers and other stakeholders. In the view of Laitinen (2002), as cited in O'Regan and Ghobadian (2007), firm efficiency is the ability of an object to produce results in a dimension determined a priori, in relation to a target. Efficiency is defined as an analysis of a company's efficiency as compared to goals and objectives (Jamrog, 2002). Within corporate organizations, there are three primary outcomes analysed, financial efficiency, market efficiency and shareholder value efficiency (Adler, 2005). The concept of efficiency is based upon the idea that an organization is the voluntary association of productive assets, including human, physical, and capital resources, for the purpose of achieving a shared purpose (Carton, 2004). Efficiency comprises the actual output or results of an organization as measured against its intended outputs. According to Richard, Devinney, Yip & Johnson (2009) efficiency encompasses three specific areas of firm outcomes, financial efficiency such as profits, return on assets and return on investment), product market efficiency such as sales, market share and shareholder return measure through total shareholder return and economic value added.

### **Measures of Organizational Efficiency**

Measuring corporate efficiency has often been controversial in terms of what exactly it is, how it should be measured and how its measures should be employed. This has resulted in the existence of different schools of thought on it, covering financial and strategic perspectives. The debate seems to be on-going with the emergence of perspectives that seek more relevance to use in different studies and instances of managing (Zeb-Obipi, 2015). The concepts of effectiveness and efficiency as measures of efficiency, either for the individual, group or organization, were first introduced by Peter Drucker (Stoner, Freeman & Gilbert, 1996 cited in Zeb-Obipi, 2015). Efficiency has often been defined in terms of these two concepts. For example, Stoner *et al.* (1996) describe efficiency as the —measure of how efficient and effective an organization is – how well it achieves appropriate objectives. Diverse definitions of these two concepts have been offered by scholars (Daft, 2001; Stoner *et al.*, 1996; Bateman and Snell, 1999). Just as it is with the corporate efficiency concepts of financial and strategic efficiency, there are diverse measures or approaches to measuring effective and efficient efficiency.

### **Cost Minimization**

According to Drury (2004), it focuses on cost reduction and continuous improvement and change rather than cost containment. The term cost reduction could be used instead of cost optimization. Whereas traditional cost control systems are routinely applied on a continuous basis, cost optimization tends to be applied on an ad hoc basis when an opportunity for cost reduction is identified. Cost minimization consists of those actions that are taken by managers to reduce costs, some of which are prioritized on the basis of information extracted from the accounting system. Although cost optimization seeks to reduce costs, it should not be at the expense of customer satisfaction. Ideally, the aim is to take actions that will both reduce costs and enhance customer satisfaction. Cost minimization has become an essential emphasis in today's highly competitive business environment. This study was aimed at defining cost optimization and discussing the philosophies that underpins optimization. Over the past 25 years, there has been a significant shift in the cost accounting and management accounting (Maher and Deakin, 1994). This shift is the result of an increasing competitive environment due to the introduction of new manufacturing and information technologies, the focus on the customer, the growth of worldwide markets, and the introduction of new forms of management organization (Blocher *et al.*, 1999). With respect to cost minimization our interest is on monetary expenses incurred as a measure of corporate productivity efficiency. Cost is conceived as expenses incurred on production factors and activities. There is no doubt that every organization seeks to minimize its expenses as much as possible as a way of maximizing profit. This has been pursued through concepts such as cost effectiveness and cost reduction. Though there are various concepts of cost as could be gleaned from Baumbach's (1983) discussion of profit planning and control, we shall limit ourselves to three here. These are quality, labor, and strategic costs.

### **Time Minimization**

When the employees are productive, they accomplish more in a given amount of time. In turn, efficiency saves their company money in time and labour. When employees are unproductive, they take longer time to complete projects, which cost employee's more money due to the time lost (Olajide, 2000). The importance of higher productivity of the employees in public enterprise cannot be overemphasized, which include the following; Higher incomes and profit; Higher earnings; Increased supplies of both consumer and capital goods at lower costs and lower prices; Ultimate shorter hours of work and improvements in working and living conditions; Strengthening the general economic foundation of workers (Banjoko, 1996). Armstrong (2006) stated that productivity is the time spent by an employee actively participating in his/her job that he or she was hired for, in order to produce the required outcomes according to the employers' job descriptions. As suggested by Bloisi (2003) the core cause of the productivity problems in the South African society are people's motivation levels and their work ethics. That speed and time are important resources, that organizations seek to maximize speed and minimize time, and that the way they do these indicates their efficiency should be obvious. Speed and time were the essence of time and motion studies since the days of scientific management introduced by Taylor that led to management efficiency. They are the sources of competitive advantage and —Time-based Competition (TBC) (Bateman and Snell, 1999). They aim at reducing the total time it takes to deliver a product or service, and this is because they entail fast and timely design, execution, response and delivery of results. It is, therefore, very apt to say: Organisations must respond to market needs quickly by introducing new products fast; quickly delivering customer orders; and responding quickly to customer requests (Bateman and Snell, 1999). There are, therefore, at least three possible indices of time minimization. These are: (i) Design-to-market Time, (ii) Product Delivery Time, and (iii) Job Completion Time. These indices are based on the conception of time as the amount of man-hour spent or duration taken to accomplish a task (Zeb-Obipi, 2015).

Time minimization is recognized as an important component of work efficiency (Downs, 2008) Time minimization is a way of developing and using processes and tools for maximum efficiency, effectiveness, and productivity (Downs, 2008) It involves mastery of a set of skills like setting goals, planning and making decisions better. At the end we have better efficiency (Brogan, 2010). According to Thompson, Arthur, Strickcan and Gamble (2010), accurate and timely information about daily operations is essential if managers are to gauge how well the strategy execution process is proceeding. Time is an essential resource since it is irrecoverable, limited and dynamic (Downs, 2008) Irrecoverable because every minute spent is gone forever, limited because only 24hours exist in a day and dynamic because it's never static (Claessens, Roe & Rutte, 2009).

### **Waste Minimization**

The measures of the resource utilization dimension of corporate productivity efficiency is Waste minimization. Waste or wastage refers to the less than maximum use of resources (Zeb-Obipi, 2015). London (2005), identifies three categories of wastages; namely: production, personnel and managerial wastages. She argues that an organization embraces waste minimization because with —fewer mistakes, fewer delays and better use of machine time and materials, productivity would inevitably improve. This does not only suggest that waste minimization of multinational oil and gas companies in Nigeria. This is a measure of productivity, it also suggests what wastages are minimized. A more comprehensive list of waste is provided by the —Muda philosophy of the Toyota Production System (TPS) propounded by Ohno (Ultimate Business, 2002 cited Zeb-Obipi, 2015). This philosophy divides waste into seven categories: overproduction, transporting, inventories or unnecessary stock on hand, producing defective goods, unnecessary motion or excess movement, excess processing, and excess waiting time. The above philosophy was partly credited with the outstanding efficiency associated with Toyota. Before the introduction of this philosophy, Ohno realized that waste was prevalent in Toyota, and if this could be eliminated, productivity could increase (Ultimate Business, 2002; Zeb-Obipi, 2015). For the purpose of a convenient discussion of waste minimization as a measure of the resource utilization dimension of corporate productivity efficiency, the above listed wastes and others can be conceived to fall into three categories. Our categories are: (i) Quality Failures (such as mistakes and defects), (ii) Idle Capacity (delays, unused or underused resources, materials and equipment, and non-productive time), and (iii) Excess Items (such as those listed by Ohno with the —excessl qualifier) (Zeb-Obipi, 2015).

Waste is defined by Gobbi (2008) as unnecessary work or holding stocks as a result of errors, poor organization or communication. Contributing to the same, Li and Olorunniwo (2008) focused on the disastrous implication of having wastes in the form of repairs, recalls and image control. On their part, Elmas and Erdogmus (2011) summarize the importance of waste reduction as positive environmental impact, legal compliance, competitiveness advancement and improved customer service. Liu (2008) defines waste minimization as the process and the policy of reducing the amount of waste produced by an entity. This is shared by Wang (2005) who adds that waste reduction involves efforts to minimize resource and energy use during manufacture. For the same commercial output, usually the fewer materials are used, the less waste is produced. Waste reduction usually requires knowledge of the production process and detailed knowledge of the composition of the waste. In any manufacturing process, there will always be wastes and scraps. In Srivastava (2008), waste is further defined as unnecessary work or holding stocks as a result of errors, poor organization or communication, while scrap refers to defective product or material that cannot be repaired, used or sold. Gobbi (2011) found that reasons for the creation of waste sometimes include requirements in the supply chain. For example, a company handling a product may insist that it should be packaged using particular packing because it fits its packaging equipment.

### **Virtual Leadership and Efficiency of Multinational Oil and Gas Companies in Nigeria**

In a changing economic climate, all organizations are looking for ways to improve productivity, streamline processes, save costs, and outperform competitors. One key to achieving that is keeping people and teams across the breadth of the organization (including partners, vendors, outside resources, and potential customers) at the same time to promote common goals and avoid duplication of effort. It is evident that virtual workforce team will have less face-to-face communication than a traditional workgroup. Since there is greater reliance on indirect communication mechanisms, such as voice-mail, e-mail and fax, members of virtual workforce are well advised to learn to use these effectively. Potential managers and supervisors of virtual workforce should possess the necessary skills to navigate the virtual workforce successfully. As remote workers become the norm and companies expand their reach nationally and globally, tracking employee efficiency and costs is increasingly difficult and critical to the bottom line (Ejiwale, 2008). Otherwise, its implementation may constitute waste rather than fulfilling its anticipated outcome of increasing productivity. Rebbecca, Aaron, Kurt, Maureen, Rex & Kirsten, (2010) established that interpersonal dimensions, such as enhancing communication and increasing social presence are two areas that impact virtual team effectiveness. Therefore, it is imperative to improve the effectiveness of communication with the virtual workforce (Ejiwale, 2008).

Virtual work is also associated with potential benefits related to economy and efficiency such as reduced travel or savings in travel costs and real estate. Real estate cost savings, which can provide cost reductions of up to 60% in virtual work (Thompson and Caputo, 2009), are associated with employees working outside offices. Moreover, virtual work offers environmental sustainability associated with for example commuting costs and travel. Further, virtual collaboration may offer long-term benefits through improved scores on human capital metrics such as increased employee efficiency, team member satisfaction (Henderson, 2008; Wilson, Strauss & McEvily, 2006), and employee productivity. These may result in improved recruitment, organizational attraction, corporate sustainability, and retention (see Thompson and Caputo, 2009). For example, virtual work may help retain valuable employees when personal circumstances dictate physical location. According to recent studies, particularly young employees, “Gen Y’ers” and “Millennials” are known for their expectations regarding the work-life balance, flexibility, and independence afforded by virtual work (Myers and Sadaghiani, 2010; Thompson and Caputo, 2009).

Rafnsdóttir and Stefánsson (2014), the work in virtual environment engenders work-life balance and wellbeing of employees. Employees with a positive attitude feel good about choices given and what they feel about virtual working, virtual working helps in creating employee satisfaction and employee productivity (Zhang, 2016). Davis and Cates, (2013), virtual working is a challenge and complex when employees work in different shifts, and it may affect their work-life balance. Butler et al (2007), acknowledged that telecommuting absolutely increases employee throughput that telecommuters had continuous productivity levels, and that no direct evidence that a soothing or the Hawthorne effect occurred. As well, negligible indication arose to support claims that telecommuting undesirably influenced the efficiency of non-telecommuting employees.

From the foregoing discourse, the study hypothesized thus:

- Ho1:** There is no significant relationship between virtual leadership and time minimization of multinational oil and gas companies in Nigeria.
- Ho2:** There is no significant relationship between virtual leadership and cost minimization of multinational oil and gas companies in Nigeria
- Ho3:** There is no significant relationship between virtual leadership and waste minimization of multinational oil and gas companies in Nigeria

**Methodology**

The study adopted a cross sectional survey research design. The population of this study was nine (9) fast moving consumer goods companies in Rivers State. Since the unit of analysis was at organizational level, only strategic managers were included. Five managers each were used for each company giving a total of 45 respondents. Census sampling was adopted because the population was small. Primary data was collected using a 5-point Likert scaled questionnaire. Strategic foresight was measured on a 4 – item instrument adapted from the work of Inkinen and Kaivo-oja (2009) in a five Likert scale. Also, Strategic insight was measured on a 5 – item instrument adapted from the works of Doz & Kosonen (2008); Doz & Kosonen (2008); Sambamurthy et al., (2003) in a five Likert scale. Similarly, corporate responsiveness was operationally measured through items adapted from de Waard, Volberda and Soeters (2013). The reliability of the instrument was achieved by the use of the Cronbach Alpha coefficient with all the items scoring above 0.70. After data cleaning, only data for 38 respondents were used for data analysis. The hypotheses were tested using the Spearman’s Rank Order Correlation Coefficient with the aid of Statistical Package for Social Sciences version 23.0 as shown below:

**Table 1: Reliability Coefficients for the Variables**

S/No	Dimensions/Measures of the study variable	Number of items	Number of cases	Cronbach’s Alpha
1.	Strategic Foresight	4	38	0.825
2.	Strategic Insight	5	38	0.818
3.	Corporate Responsiveness	4	38	0.849

Source: SPSS Output

Data Analysis and Results

Table 4.22 Correlations Matrix for Virtual Leadership and Organizational efficiency Measures

		Virtual Leadership	Time Minimization	Cost Minimization	Waste Minimization	
Spearman's rho	Virtual Leadership	Correlation Coefficient	1.000	.745**	.223**	.712**
		Sig. (2-tailed)	.	.000	.000	.000
		N	46	46	46	46
Time Minimization	Time Minimization	Correlation Coefficient	.745**	1.000	.549**	.572**
		Sig. (2-tailed)	.000	.	.000	.000
		N	46	46	46	46
Cost Minimization	Cost Minimization	Correlation Coefficient	.223**	.549**	1.000	.394**
		Sig. (2-tailed)	.000	.000	.	.007
		N	46	46	46	46
Waste Minimization	Waste Minimization	Correlation Coefficient	.712**	.572**	.394**	1.000
		Sig. (2-tailed)	.000	.000	.007	.
		N	46	46	46	46

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

Source: SPSS Output version 23.0

What is the relationship between virtual leadership and organizational efficiency of multinational oil and gas companies in Nigeria?

The correlation coefficient (rho) result in table 4.22 was used to answer research question 3. Table 4.22 shows a Spearman Rank Order Correlation Coefficient (rho) of 0.745 on the relationship between virtual leadership and time minimization. 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 time minimization was as a result of the adoption of virtual leadership. Therefore, there is a positive and strong correlation between virtual leadership and time minimization of multinational oil and gas companies in Nigeria.

Similarly, Table 4.22 shows a Spearman Rank Order Correlation Coefficient (rho) of 0.223 on the relationship between virtual leadership and cost minimization. This value implies that a weak relationship exists between the variables. The direction of the relationship indicates that the correlation is positive; implying that an increase in cost minimization was as a result of the adoption of virtual leadership. Therefore, there is a positive and weak correlation between virtual collaboration and cost minimization of multinational oil and gas companies in Nigeria.

Furthermore, Table 4.22 shows a Spearman Rank Order Correlation Coefficient (rho) of 0.712 on the relationship between virtual leadership and waste minimization. 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 waste minimization was as a result of the adoption of virtual leadership. Therefore, there is a positive and strong correlation between virtual leadership and waste minimization of multinational oil and gas companies in Nigeria.

Therefore, to enable us accept or reject hypotheses 7, 8, and 9 as well as generalize our findings to the study population the p- value was used as shown below:

**H<sub>01</sub>:** There is no significant relationship between leadership teams and time minimization of multinational oil and gas companies in Nigeria.



Similarly displayed in the table 4.22 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 4.22, 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 virtual leadership and time minimization of multinational oil and gas companies in Nigeria.

**H<sub>02</sub>:** There is no significant relationship between virtual leadership and cost minimization of multinational oil and gas companies in Nigeria of multinational oil and gas companies in Nigeria.

Also displayed in the table 4.22 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 4.22, 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 virtual leadership and cost minimization of multinational oil and gas companies in Nigeria of multinational oil and gas companies in Nigeria.

**H<sub>03</sub>:** There is no significant relationship between virtual leadership and waste minimization of multinational oil and gas companies in Nigeria.

Also displayed in the table 4.22 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 4.22, 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 virtual leadership and waste minimization of multinational oil and gas companies in Nigeria.

Therefore, the results for the third set of hypotheses with regards to the relationship between virtual leadership and organizational efficiency are stated as follows:

- i. There is a positive and strong significant relationship between virtual leadership and time minimization of multinational oil and gas companies in Nigeria.
- ii. There is a positive and weak significant relationship between virtual leadership and cost minimization of multinational oil and gas companies in Nigeria.
- iii. There is a positive and strong significant relationship between virtual leadership and waste minimization of multinational oil and gas companies in Nigeria.

### **Discussion of Findings**

The findings as presented in table 4.22 revealed the test of hypotheses 7-9 which indicated for hypothesis seven that there is a strong positive and significant relationship between virtual leadership and time minimization of multinational oil and gas companies in Nigeria. Hypothesis eight revealed that there is a weak positive and significant relationship between virtual leadership and cost minimization of multinational oil and gas companies in Nigeria. The test for the ninth hypothesis revealed that there is a strong positive and significant relationship between virtual leadership and cost minimization of multinational oil and gas companies in Nigeria. This depicts that use of virtual platform in organization improve teamwork efficiency in the organization through fostering a closer partnership among the organization managers and their subordinates. This finding reinforced Malhotral and Majchrzak (2007) who investigated leadership practices of effective leaders of virtual teams in USA and found that recognition of success achieved by the member of virtual teams in an organisation will build trust and spur them to work towards achieving the success that an organisation desires. The study also pointed out that praising of managers or supervisors of virtual teams will not only motivate but also give them sense of belonging in the organisation.

Similarly, the finding of this study is in line with Gibson and Cohen (2003); Hinds and Kiesler, (2002); Zander *et al.* (2012) that argued that leadership in virtual teams generally needs more structure than leadership in conventional teams. The impact, action, and even authority of managers may therefore be needed. Although some scholars (e.g. Bell & Kozlowski, 2002) emphasize a virtual manager's need to distribute and delegate leadership functions and responsibilities to team members, the majority reminds us that virtual managers need to take straightforward leader actions (Davis & Bryant, 2003) and provide clear directions for their virtual teams (Kirkman, Rosen, Gibson, Tesluk & Mcpherson, 2004). The processes in virtual work must be explicitly and carefully managed and coordinated (Jonsen *et al.*, 2012). In co-located teams the interaction norms, for example, can be implicitly negotiated as team members observe and react to each other's facial expressions and other nonverbal behavior. In a virtual team there is typically limited opportunity for this.

### Conclusion

Organizations are involved in virtual activities not only to enhance reduced cost of operations, bridge the impediments created by distance, but also to satisfy customers so as to obtain sustainable competitive advantage. Multinational oil and gas companies are not therefore left out in embracing virtual operations in order to attain sustainable competitive advantage by way of communicating values to the stakeholders. The current study emphasized that the efficiency of an organization rests on the design and implementation of effective management practices. Therefore, if an organization desires optimum efficiency from its virtual arrangements, the team and the employees involved in such virtual arrangement need to be properly managed through the design and implementation of effective management practices. Virtual work has repeatedly stressed the importance of leadership and suggests that virtual teams demand leadership capabilities that are unique to organizational management in the virtual context. Therefore, this study concludes that virtual leadership significantly and positively influence organizational efficiency of multinational oil and gas companies in Nigeria.

### Recommendations

- i. With regards to virtual team management, management of multinational companies need to invest both time and money in user friendly technologies. Virtual managers should work towards improving communication elements in the organization such as staff exchanges of ideas through virtual platforms; staff sharing of work experiences through virtual platforms; staff networking; and staff dissemination of data and information through virtual platforms to enhance teamwork performance.
- ii. With regards to virtual collaboration, the management of multinational oil and gas companies needs to eliminate roadblocks (such as outdated technology) that tends to disrupt online collaboration and to increase the level of information sharing through video conferencing, e-mails, phone calls, instant messaging and audio conferencing.
- iii. With regards to virtual leadership, virtual managers are to increase the member involvement in the workgroup to enhance organisational identification; this can be done by allowing the team members to influence decisions that are relevant for the team or the firm. Multinational managers in a virtual teams should adopt either a transformational or situational leadership style in order to be successful within virtual team management.
- iv. Management of multinational oil and gas companies should work towards improving organizational climate elements (trust and autonomy) in the organization so as to enhance staff exchanges of ideas through virtual platforms; staff sharing of work experiences through virtual platforms; staff networking; and staff dissemination of data and information through virtual platforms to enhance teamwork efficiency.

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