

NETWORK TECHNOLOGY INFRASTRUCTURE MANAGEMENT AND CORPORATE VITALITY: A CORRELATIONAL EVIDENCE FROM TERTIARY HOSPITALS IN SOUTH-SOUTH, NIGERIA

Korubo-Fi, A.

Department of Business Administration, Faculty of Administrative and Management,
Rivers State University, Nkpolu- Oroworukwo, Port Harcourt, Rivers State.

and

BagshawK. B.

Department of Business Administration, Faculty of Administrative and Management,
Rivers State University, Nkpolu- Oroworukwo, Port Harcourt, Rivers State.

ABSTRACT

This study investigated the correlation between network technology infrastructure management and corporate vitality of tertiary hospitals in South-South, Nigeria. The study was conceptualized with network technology infrastructure management as predictor to corporate vitality measures of responsiveness, growth and resilience. The study adopted a cross sectional research design with a correlational investigation type. The study population comprised of the nine (9) tertiary hospitals operational in the South-South of Nigeria, and listed on the directory of the Medical and Dental Council of Nigeria (MDCN, 2025). This study adopts a Census Method and administered six (6) copies of structured questionnaire to Deans of Medicine, Chief Pharmacists, Chief Nursing Officers, Heads of Administration, Chief Information Technology Officers and Heads of Laboratory, sourced from the nine (9) tertiary health institutions. This means that a total of 54 respondents were used for the study. Data was collected through structured questionnaire that was designed in Likert 5-point scale. Pearson's Product Moment Correlation (PPMC) was used in testing the various hypotheses with the help of the Statistical Packages for Social Sciences Version 25.0. After data administration, retrieval and cleaning, only 47 (87.03%) of the questionnaire were valid and used for the analysis. From the analysis of data, it was revealed that network technology infrastructure management had a significant relationship with corporate vitality. Based on these findings, the study concluded that network technology infrastructure management significantly correlates with corporate vitality of tertiary hospitals in South-South, Nigeria. The researcher recommended among others, that management of the tertiary hospitals in South-South Nigeria should seek to establish and manage standardized network infrastructure to ensure efficiency in health data records management. This will in no small measure, boost responsiveness, growth and resilience within the hospitals.

Keywords: Network Technology Infrastructure Management, Corporate Vitality, Responsiveness, Growth, Resilience, Tertiary Hospitals.

INTRODUCTION

The present era is characterized with widespread use of digital technology, computers and the internet which have brought significant revolution in various aspects of the human society. As noted by John-Eke and Gabriel (2021), today's business arena is experiencing unprecedented transformations spurred by globalization and increasing technological advancements. Not just the business arena, the entirety of the world has become a global community as every country is interconnected with one another through technology (Adedokun & Uthman, 2019). Bhasin and Tripathi (2021) observed that in the heart of technological advancements that are revolutionizing the world lies information technology infrastructure. It is through information infrastructure that people connect with others even without having to meet physically. In fact, there is no gain saying that no business regardless of size, location, structure or industry, can effectively function in this present dispensation without relying heavily on information technology infrastructure.

Therefore, organizations' ability to effectively process, disseminate and manage data through information technology infrastructure has become critical for enhancing corporate vitality. Within the Nigerian healthcare industry, Bhasin and Tripathi (2021) highlight the significance of information technology infrastructure in managing patients data. The IT infrastructure encompasses the tangible and intangible components of information technology, including hardware, software, and networks, which are structured into systems to support the implementation of IT-based products and processes, thereby facilitating innovation (Toader *et al.*, 2018). Network infrastructure serves as communication backbone in the healthcare sector. They are designed not just to provide backbone connectivity, but also to ensure reliability of hospital data in accordance with the security measures and standards accepted in the field of information and communications technology (Mauerhoefer *et al.*, 2017). Uzochukwu *et al.* (2018) emphasize that the adoption of network infrastructure management would help hospitals to collect, organize and analyze patients data. By analyzing historical and real-time data, healthcare organizations can recognize trends, assess patients health conditions, and evaluate overall performance aimed at building resilience and responsiveness to patients needs and achieving corporate vitality in healthcare service delivery (Dieke, Udeh & Nwenekorum, 2024).

There are paucity of empirical studies depicting the significance of network technology infrastructure management on corporate vitality of tertiary hospitals in South-South Nigeria are dearth (Mauerhoefer *et al.*, 2017; John-Eke & Gabriel, 2021). This may have contributed to the numerous setbacks and challenges plaguing the sector. In the observation of Adedokun and Uthman (2019), tertiary hospitals in Nigeria at large and within the South-South region in particular have long battled with lack, or low vitality in their corporate affairs, particularly in the areas of responsiveness, growth pace and resilience capacity. There is veritable need to eliminate this gap, by devoting research attention to both theoretical and empirical nexus between network technology infrastructure management and corporate vitality of tertiary hospitals in South-South Nigeria, hence the motivation for this paper.

Purpose and Objectives of the Study

The main purpose of this study was to examine the empirical correlation between network technology infrastructure management and corporate vitality of tertiary hospitals in South-South,

Nigeria. Specifically, the study sought to:

- i. Examine the correlation between network technology infrastructure management and responsiveness of tertiary hospitals in South-South Nigeria
- ii. Ascertain the correlation between network technology infrastructure management and growth of tertiary hospitals in South-South Nigeria
- iii. Determine the correlation between network technology infrastructure management and resilience of tertiary hospitals in South-South Nigeria

Conceptual Framework



Figure 1: Conceptual framework showing correlation between network technology infrastructure management and corporate vitality.

Source: Adapted from Osman, Abdulle and Osoble (2024).

Research Questions

The following research questions were answered in the study:

- i. What is the correlation between network technology infrastructure management and responsiveness of tertiary hospitals in South-South Nigeria?
- ii. What is the correlation between network technology infrastructure management and growth of tertiary hospitals in South-South Nigeria?
- iii. What is the correlation between network technology infrastructure management and resilience of tertiary hospitals in South-South Nigeria?

Research Hypotheses

The study tested the following null hypotheses.

HO₁: There is no significant correlation between network technology infrastructure management and responsiveness of tertiary hospitals in South-South Nigeria

HO₂: There is no significant correlation between network technology infrastructure management and growth of tertiary hospitals in South-South Nigeria

HO₃: There is no significant correlation between network technology infrastructure management and resilience of tertiary hospitals in South-South Nigeria

LITERATURE REVIEW

Survival-based Theory

Survival based theory was advanced by Herbert Spencer (Khairuddin, 2005) who proposed that organizations have to constantly adapt to changes in environment so that they can survive. According to Herbert Spencer, it is only natural for the organizations that change with the environment to survive. In addition, efficiency is a key strategy in order to survive. That organizations survive if they offer the best product that is produced in the least amount of time using the least number of resources (Khairuddin, 2005). The choice and adoption of information technology management infrastructure as a strategic tool is an effort made by the organisation to systematically build interactions with related functions in setting decisions as a guideline for corporate objectives within a specified period to maintain and enhance the company's competitiveness towards its business environment (Amrollahi & Rowlands, 2017). Thus, information technology applications are strongly altering the way in which production operations are carried out in a variety of industries and thus using information technology to create and acquire a corporate vitality among tertiary hospitals.

Network Technology Infrastructure Management

Network technology infrastructure management refers to the control and coordination of the various communication and correspondence channels and mediums, and the computer programs or software that facilitate such in the organisation (Nada *et al.*, 2015). Networks describe the connectivity and linkage across the workplace and the systems that facilitate such (Langley *et al.*, 2021). Iyengar *et al.* (2015) posited that network infrastructure highlights the various components that support and drive the connectivity across systems and functions in the organisation. Network technology infrastructure management creates a cohesive and more integrated workplace, allowing for a more coherent disposition, and enabling improved levels of collaboration within and also outside the organisation. Iyengar *et al.* (2015) noted that the management of network technology infrastructure focuses not only on the process of information exchange but also on the efficiency of network technology and systems and the security, accessibility or privacy of such systems. Network infrastructure management involves the planning, designing, implementing, and maintaining the hardware, software, and technologies that support an organization's network connectivity and operations. Network devices include routers, switches, access points, firewalls, and other hardware for network connectivity. The primary function of network infrastructure management is to optimize network performance, ensure data security, and facilitate communication and data exchange within an organization's network infrastructure.

The Concept of Corporate Vitality

Corporate vitality refers to the extent to which the organisation can consistently renew itself through the re-evaluation of its values, norms and strategies, and that way able to innovate and adapt to the changes and realities of its environment (Barney, 2017). Lavrusheva (2020) identified the changes in the environment as imposing on the behaviour and operations of organisations. Through the rejuvenation of values and practices, organisations can realign their behaviour with that of prevailing environmental or market characteristics and thus ensure their survival and resilience (Karim & Capron, 2016). Corporate vitality captures and is concerned with much more than just organisational change and adaptation. It reflects the organisation's capacity for learning,

staying in tune with and responding to the emerging concerns and conditions of the market. This way, it focuses on both responsive as well as proactive actions that drive the organisation's interest; ensuring the achievement of its objectives and goals (Akpotu & Ozioko, 2020). Responsiveness, growth and resilience measures of corporate vitality are identified (Lavrusheva, 2020) and discussed in this paper.

Responsiveness: Harcourt and Ateke (2018) construe responsiveness as firm's ability to detect environmental changes and adapt to them by (1) making changes internally at individual action and learning level, or at organizational structures and policies, and (2) developing active interfaces that alters the environment to increase the firms' adaptability. It involves an organisation's ability to actually meet the demands or emerging expectations of its environment.

Growth: is a more physical and objective outcome of an organisation's behaviour as demonstrated through increases in various facets and components of that organisation. It describes the extent to which the organisation has expanded in terms of employee size, or operations.

Resilience: is a process capability where companies continuously reinvent themselves by overcoming barriers to change and developing multiple sources of competitive advantage (Demmer *et al.*, 2011).

Empirical Review

Ananga, Paul and Mwalili (2024) examined the role of technology infrastructure on business performance of commercial banks in Kenya. The population consisted of all 42 commercial banks in Kenya. Respondents' population comprised of five top managers from each bank translating to 210 top managers. Slovin's formula was used to calculate the sample size. Purposive sampling technique was used to select 138 top managers of the 42 commercial Banks in Kenya. Quantitative data was collected and analyzed in this study by calculating the response rate with descriptive statistics such as mean, standard deviation, median and proportions using the Statistical Package for Social Sciences (SPSS) version 24). Regression analysis and correlation analysis was used to carry out inferential data analysis to determine the direction and strength of the relationship between the independent and the dependent variables. The study revealed that hardware/Software, network and database influence business performance of Commercial Banks in Kenya. Nada, Rusinah, Ibrahim and Mahmoud (2024) investigated the impact of information technology (IT) infrastructure on innovation performance as a critical issue in the Iraqi private Universities. The study population consisted of six private Universities in Iraq. From these, 75 academics of the faculty were chosen. The regression analysis results indicated a positive and statistically significant association between network technology infrastructure and innovation performance.

Shih-Ming and Chiu-Yun (2024) examined the impact of foundational information technology (IT) capabilities on supply chain efficiency on operational performance. Employing a structured model with four hypothesized relationships, this study collected data through a survey, yielding 157 valid questionnaires. The analysis was performed using the partial least squares method within a structural equation modeling framework. The study found that database infrastructure capabilities significantly enhance supply chain efficiency, which in turn has a direct positive impact on operational performance. Kamau, Senaji and Nzioki (2019) attempted to examine the effect of information technology capability on competitive advantage of the banking sector in Kenya. A positivist research philosophy was adopted for the study. Focusing on 39 operational

commercial banks in Kenya, a descriptive survey design was adopted. Primary data was collected and applied in the study. The relationship between the variables was tested using ordinary least square regression model. The study findings revealed that database management as a dimension of information technology capability has positive and significant effect on competitive advantage of commercial banks in Kenya.

Toader, Firtescu and Anton (2018) carried out a study to examine the impact of information and communication technology infrastructure on economic growth, an empirical assessment for the EU countries. Using panel-data estimation techniques, the researchers investigate empirically how various indicators of ICT infrastructure affect economic growth, proxied in the study by GDP per capita. Results indicated a positive and strong effect of using database management infrastructure on economic growth in the EU member states. Al-Hawary and ALdafiri (2017) researched the adoption of the information technology elements on employee performance at the Interior Ministry of Kuwait State, the elements of information technology variables represented by (hardware, software, databases, networks, and the human element), the study population consisted of managers in the Interior Ministry of Kuwait State, and has been used comprehensive method of the population, and the researcher used the questionnaire to collect data of the study. The researcher utilised statistical tests to analyse the questionnaire, answer the study questions and test of hypotheses. The researcher found that there was a statistically significant effect at the level of significance for the adoption of information technology elements represented by (hardware, software, databases, and the human element) on employee performance of the Interior Ministry of Kuwait State. Sequel to the above submissions, the following hypothetical statements are made:

HO₁: There is no significant relationship between network technology infrastructure management and responsiveness of tertiary hospitals in South-South Nigeria

HO₂: There is no significant relationship between network technology infrastructure management and growth of tertiary hospitals in South-South Nigeria

HO₃: There is no significant relationship between network technology infrastructure management and resilience of tertiary hospitals in South-South Nigeria

METHODOLOGY

This study adopts a cross-sectional research design with a correlational investigation type. The study population comprised of the nine (9) tertiary hospitals operational in the South-South of Nigeria, and listed on the directory of the Medical and Dental Council of Nigeria (MDCN, 2025). This study adopts a Census Method and administered six (6) copies of structured questionnaire to Deans of Medicine, Chief Pharmacists, Chief Nursing Officers, Heads of Administration, Chief Information Technology Officers and Heads of Laboratory, sourced from the nine (9) tertiary health institutions. This means that a total of 54 respondents were used for the study. The reliability of the instrument was achieved by the use of the Cronbach Alpha coefficient with all the items scoring above 0.70. Data for the study was collected through primary source. Pearson's Product Moment Correlation was used to test the hypotheses with the aid of the Statistical Packages for Social Science, version 25.0.

Table 1: Reliability Test - Cronbach's Alpha Analysis

S/N	Variables	Number of Items	Cronbach's Alpha Coefficients
1	Network Technology Infrastructure Management	5	0.812
2	Responsiveness	5	0.843
3	Growth	5	0.741
4	Resilience	5	0.803

Source: SPSS Output form field data

As shown in Table 1, the results of the Cronbach’s alpha analysis revealed that all the variables in the study produced high Cronbach’s Alpha coefficients indicating that, there is inter-item consistency among the variables in the study. This means that, if this study is conducted again in similar condition, the results would be similar to the results of our study.

DATA ANALYSIS AND FINDINGS

Bivariate Analysis

The secondary data analysis was carried out through the use of Pearson’s Product Moment Correlation (PPMC) tool at a 95% confidence level. Specifically, the tests cover hypotheses Ho1 to Ho3 . We have depended on the Pearson’s Product Moment Correlation tool to carry out the analysis thus the probability criterion of 0.05 significance level was adopted for accepting the null hypotheses at ($P > 0.05$) or rejecting the hypotheses at ($P < 0.05$). The analysis on the relationship between network technology infrastructure and the measures of corporate vitality is addressed in this section of the study. The result is presented using the figure 2.

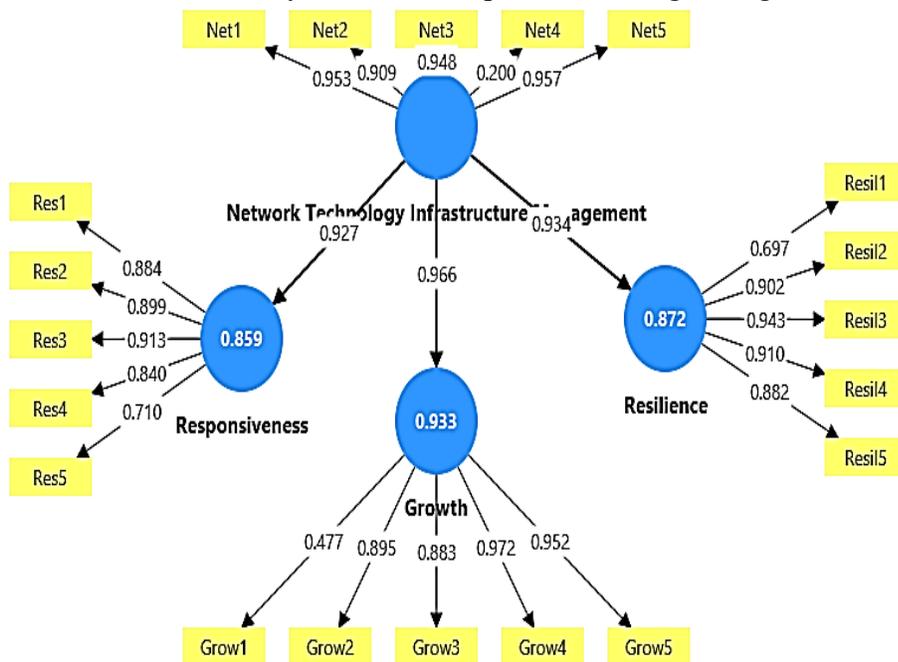


Figure 2: PLS-SEM model for network technology infrastructure management and corporate vitality measures

Table 2: Network Technology Infrastructure Management and Corporate Vitality Model Coefficients

Variables	Network Technology Infrastructure Management	Significance level (0.05)
Responsiveness	0.927	0.00
Growth	0.966	0.00
Resilience	0.934	0.00

Source: Survey Data (2025)

In Table 2, the role of network technology infrastructure management in the outcome of corporate vitality is shown to be significant and positive. The result from the analysis affirm to the network technology infrastructure management of the tertiary hospitals, as impacting on its responsiveness ($\beta = 0.927$ where $P = 0.000$), growth ($\beta = 0.966$ where $P = 0.000$) and resilience ($\beta = 0.934$ where $P = 0.000$). The evidence points to imperatives of related practices that reflect network technology infrastructure management in the tertiary hospitals and the significance of such to the vitality of the hospitals. Following the evidence generated, all related null hypothetical statements are therefore rejected as the results are stated as follows:

- i. There is a significant relationship between network technology infrastructure management and responsiveness of tertiary hospitals in South-South Nigeria
- ii. There is a significant relationship between network technology infrastructure management and growth of tertiary hospitals in South-South Nigeria
- iii. There is a significant relationship between network technology infrastructure management and resilience of tertiary hospitals in South-South Nigeria

DISCUSSION OF FINDINGS

The findings of this research indicate that network technology infrastructure management significantly contributes toward the outcomes of corporate vitality in tertiary hospitals in South-South Nigeria. Thus, without proper management of network technology infrastructure, businesses including hospitals are unable to store accurate data for decision making. These findings are in tandem Ananga *et al.* (2024) as they revealed that network technology infrastructure management influence business performance of Commercial Banks in Kenya. In line with the present study findings, Nada *et al.* (2024) indicated a positive and statistically significant association between network technology infrastructure and innovation performance. Shih-Ming and Chiu-Yun (2024) agree to the present study findings as they revealed that database infrastructure capabilities significantly enhance supply chain efficiency, which in turn has a direct positive impact on operational performance. In line with the present study findings, Kamau *et al.* (2019) revealed that network technology infrastructure management as a dimension of information technology capability has positive and significant effect on competitive advantage of commercial banks in Kenya. Toader *et al.* (2018) indicated a positive and strong effect of using network technology infrastructure management infrastructure on economic growth in the EU member states. Al-Hawary and ALdafiri (2017) found that there is a statistically significant effect at the level of significance for the adoption of information technology elements represented by (hardware,

software, databases, and the human element) on employee performance of the Interior Ministry of Kuwait State.

CONCLUSION AND RECOMMENDATIONS

This research established the correlation between network technology infrastructure management and corporate vitality as significant and positive within the context of tertiary hospitals in South-South Nigeria. Based on findings from the analysis, this study concludes that network technology infrastructure management has significant and positive correlation with corporate vitality. Network technology infrastructure management enables network performance optimization, ensures data security, and facilitate communication and data exchange within an organization. Thus, management and control of information and technology within the hospitals with emphasis on network technology infrastructure management can imp corporate vitality outcomes among tertiary hospitals. Drawing on the evidence generated from the investigation, the following recommendations are put forward:

- i. Management of the tertiary hospitals in South-South Nigeria should seek to establish and manage standardized network infrastructure to ensures efficiency in health data records management. This will in no small measure, boost responsiveness, growth and resilience within the hospitals.
- ii. Management of the tertiary hospitals in South-South Nigeria should emphasize the need for network technology infrastructure management to ensure network performance optimization, data security, facilitate communication and data exchange within the hospitals in ways that increase the organisations' responsiveness and resilience.
- iii. Management of the tertiary hospitals in South-South Nigeria should use various network and communication infrastructures to meet up with present day business demands as this will help them record sustained vitality.

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