



Hardware Infrastructure and Competitive Advantage of GSM Service Providers in Rivers State, Nigeria

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Abstract: *This study investigated influence of hardware infrastructure on competitive Advantage of GSM Service providers in Rivers State. The study was conceptualized with hardware infrastructure as predictor to competitive advantage measures of cost advantage, differentiation and market focus. The study adopted a causal research design. The study population comprised the four (4) GSM service providers operating within the geographical boundaries of Rivers State namely, MTN, Airtel, Globacom and 9mobile. These companies are registered with the Nigerian Communication Commission. The study sample was the same as the population because the population was not large. However, a Census Method was used to administer nine (9) copies of structured questionnaire to Operations Managers, Marketing Managers, Brand Managers, Directors of Communication, Sales Managers, Directors of Technical Services, Customer Care Managers, Front Desk Officers and Heads of Advertisement from each of the four (4) GSM service providers in Rivers State, making it a total of 36 respondents used for the study. Data were collected through structured questionnaire that was designed in Likert 5-point scale. Regression Analysis was used to test the significance of the predictor variable on components of the criterion variable, with the aid of Statistical Package for Social Sciences, version 23.0. After data administration, retrieval and cleaning, only 31 (86.11%) of the questionnaire responses were valid and used for the analysis. From the analysis of data, it was revealed that hardware infrastructure had a significant influence on competitive advantage. Based on these findings, the study concluded that hardware infrastructure significantly influences competitive advantage of GSM service providers in Rivers State. The researcher recommended among others, that GSM Service Providers should capitalize on the pivot role of Hardware infrastructure in their operations to enhance cost advantage and achieve overall performance.*

Keys words: *Competitive advantage, Differentiation, GSM service providers, Hardware infrastructure, Market focus.*

INTRODUCTION

Today's business environment is confronted with external factors in the form of globalization, competition and technological advancements. Due to these factors, organizations are characterized by excessive amounts of data and information exchange used to enhance their knowledge of clients and customers as well as improve competitive position. To overcome the competition that has ravaged almost every industry today, organizations must be able to effectively use and convert available data into information useful for decision making and coordination in purchasing and businesses management (SCM) (Bahrami, Ghorbani & Arabzad, 2012). Businesses management focuses on optimizing goods and material flows by sharing and analyzing information about the business's activities in internal and external business transactions (Kariuki, 2015). The adoption of new technologies and solutions within the businesses increases the availability of data from internal and external sources aimed at

improving competitive advantage (Celikyurek, Karakus, Aygun & Tas, 2019).

Information technology infrastructure such as the hardware component helps the companies in collecting, organizing and analyzing data for the operational efficiency. Studies on hardware infrastructure on competitive advantage is dearth and in its infant stage (Diabat, Khodaverdi, & Olfat, 2013). There is need to devote research attention to both theoretical and empirical linkage between hardware infrastructure and competitive advantage following its role in today's business life. This study sought to contribute to knowledge as it empirically explored the influence of hardware infrastructure on competitiveness of GSM service providers in Rivers State, Nigeria

Study Variables/ Conceptual Framework

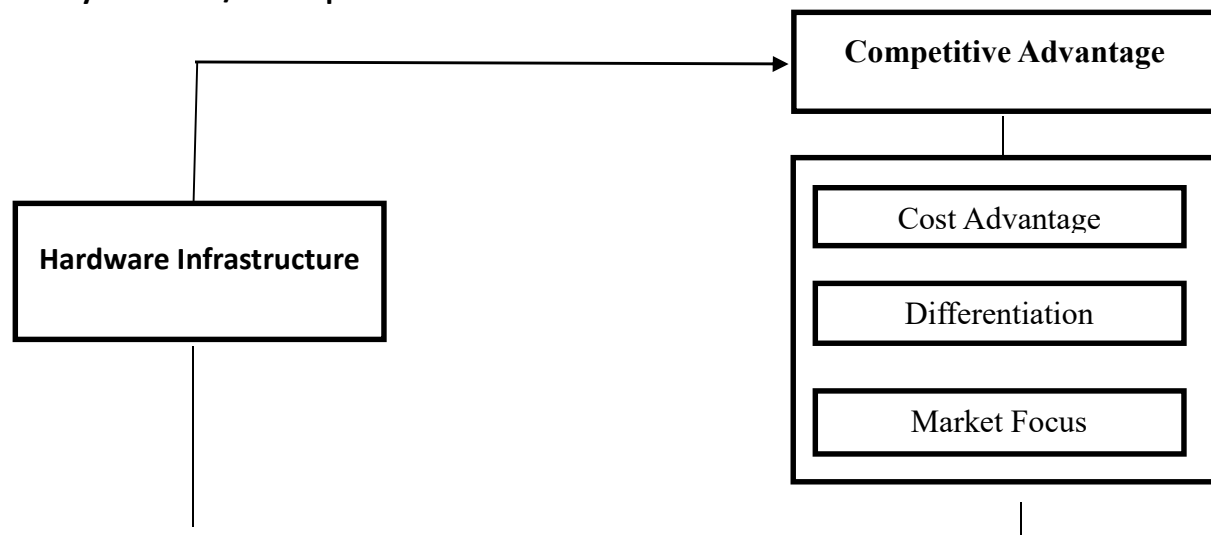


Figure 1: Conceptual framework of the impact relationship between hardware infrastructure on competitive advantage.

Source: adopted by Milimo, J. N. W., Sagwa, E. V. & Sakwa, M.M. (2015). An empirical study of the influence of information technology infrastructure on supply chain performance of public universities in Kenya. *Journal of Emerging Trends in Economics and Management Sciences (JETEMS)*, 9(5), 249-257.

LITERATURE REVIEW

Theoretical Foundation

Dynamic capabilities theory proposed by Teece and Pisano in 1994 and is an extension from resource-based view (RBV) of the firm (Diabat, Khodaverdi, & Olfat, 2013). Teece, Pisano, and Shuen (1997) argued that dynamic capability theory involves the ability of a firm to combine, develop and reconfigure external and internal expertise that allows speedy respond to changing environmental situations. Scholars have proposed that in order for the firm to remain competitive

in the market, the firm need to develop specific capabilities and continuous learning in the new or changing market environment (Wilden, Gudergan, Nielsen, & Lings, 2013; Barreto, 2010). The lack of dynamic capabilities will prohibit the firm to maintain their competitive advantage especially in the changing environment (Gnizy, Baker, & Grinstein, 2014). Eisenhardt and Martin (2000) define dynamic capability theory as model that employs resources to recreate market change. Market is change is a situation in which market evolves, emerges, splits or even dies. Apart from that, dynamic capabilities are the results of the alteration of resources that has been acquired, integrated and recombined to develop new creation of strategies (Diabat, Khodaverdi, & Olfat, 2013; Barreto, 2010). Hence, dynamic capability is the factor of the creation of new sources of competitive advantage. Applying this theory to the present study context, it can be said that the world has gone digital, it requires new information technology infrastructures to ensure business success and stamina to withstand competitive pressures that erupts from the business environment.

Concept of Hardware Infrastructure

Hardware refers to machines, wiring, and other physical components of a computer or other electronic system. A hardware infrastructure is essentially any component in the overall IT infrastructure that can be touched like servers, desktops and even smartphones (Bhatt, Wang & Rodger, 2017). With the rise of cloud computing, the demand for in-house hardware infrastructure is shrinking as more data systems are being moved off-premises. Hardware infrastructure is the collection of physical elements that constitutes an information technology system. According to Ngobe (2020), a hardware infrastructure refers to the physical parts or components of an information technology system such as monitors, mouse, keyboard, computer data storage, hard drive disk (HDD), system unit (graphic cards, sound cards, memory, motherboard and chips), etc. all of which are physical objects that can be touched. According to Wali (2013), hardware infrastructure includes servers, mobile devices, hard drive, network cables, printers, storage devices and laptops. Server the term "server" commonly refers to the computer system that receives requests for a web file and sends those files to the client. Servers manage network resources. For example, a user may set up a server to control access to a network, send/receive e-mail, manage print jobs, or host a website. They are also proficient at performing intense calculations. Some servers are committed to a specific task or one website, often called dedicated servers. A server is a software or hardware device that accepts and responds to requests made over a network. The device that makes the request, and receives a response from the server, is called a client (Wali & Iruka, 2013). However, many servers today are shared servers that take on the responsibility of e-mail, DNS, FTP, and multiple websites in the case of a web server (Masa'deh, 2013).

Competitive Advantage

Competitive advantage refers to the unique strengths or attributes that allow a company to outperform its competitors. When a GSM firm creates durable competitive advantage, it sets itself apart from the competition and provides value to its customers as well as stakeholders (A. Twin, S. Anderson & Y. Perez, 2023). Competitive advantage as a multidimensional variable has

been measured with several criteria. For instance, Ambastha and Momaya (2004) measured competitive advantage with brand reputation, value creation, customer satisfaction, market share, productivity, new product success, cost and price advantage, profitability, cost, differentiation, innovativeness, product quality, flexibility, adaptability and persuasive power. Thus, we adopt cost advantage, differentiation and market focus as indicator of competitive advantage.

Cost Advantage

The success of any organization largely depends on how strategically cost is managed compared with that of competitors. It certainly provides competitive advantage which is essential in this hyper competitive market or business world. Cost advantage is a planned positive approach to reduce expenditure. It is a corrective function by continuous process of analysis of costs, functions, etc. for further economy in application of factors of production. Cost advantage according to Oyerogba, Olaleye and Solomon (2014), means reducing cost associated with production or other cost activities without affecting the quality of product or service as well as activities. Through cost advantage procedures or techniques managers reduce cost. For this, they develop different cost advantage techniques (Otekunrin, Nwanji, Olowookere & Eluyela, 2018). Adeniji (2000), cost advantage is a planned positive approach to reduction expenditure. It implies the reduction in unit cost of goods or services without impairing suitability for the use intended. In the views of Preetabh (2010), cost advantage is the process whereby permanent savings are made without any reduction in the quantity and/or usefulness of the products. It can be seen as a development attitude of mind, which poses a challenge to all standards with a view to their improvement. Cost advantage scheme should aim specific efforts to reduce costs through improved methods, approaches, work arrangement and reviews.

Differentiation

Just as human beings want to be unique and be seen differently, the organization also tries to be unique and do things differently. Doing things differently and producing products and services that are unique in terms of colour, size, shape is what is called product differentiation. In order to produce products that are different and unique, the organization must have resources that cannot be imitated easily by the competitors. Michael Porter (1985) argues that an organization that produces goods unique than its competitors can charge higher prices and will not raise complaints from customers because the customer's loyalty will have achieved a competitive advantage. Rugraff, (2012) simply believed that differentiating product and services is all about adding new values. The customers also must be relatively price-insensitive. Adding product features means that the production or distribution costs of a differentiated product may be somewhat higher than the price of a generic, non-differentiated product. Customers must be willing to pay more than the marginal cost of adding the differentiating feature if a differentiation strategy is to succeed (Bukirwa, 2017). A differentiation strategy is called a "broad differentiation strategy" when the differentiator-company goes for segmenting its market into several small segments (niches) and then offers a product designed for each market-segment. Coca-Cola follows a broad differentiation strategy in that it offers normal bottled cola, can-cola, and diet-cola for different segments.

Market Focus

The underlying premise of the focus strategy is that a firm is better able to serve a limited segment more efficiently than competitors can serve a broader range of customers. Firms using a focus strategy simply apply a cost leader or differentiation strategy to a segment of the larger market (Rugraff, 2012). Firms may thus be able to differentiate themselves based on meeting customer needs, or they may be able to achieve lower costs within limited markets. Focus strategies are most effective when customers have distinctive preferences or specialized needs. A company can pursue a focus strategy either with a low-cost approach or a differentiation approach. Focused low-cost strategy is the strategy of entering into a niche market with a unique type of product that has a special need among the customers in the niche market. This strategy is targeted to those buyers who desire to have unique products at a low-cost.

Focused Differentiation Strategy is the strategy of operating business with a differentiated product in a chosen niche market. When a company pursues a focused strategy based on differentiation, it concentrates on a narrow buyer segment and offers customized attributes in products better than competitors' products. Here, the focuser company competes against competitors not based on low cost, rather based on product differentiation. This strategy is often called 'focus strategy.' It focuses on a particular segment or part of a market. It is directed towards serving the needs of a limited customer group. According to Kinyuira (2014), a niche strategy/focus strategy is an integrated set of actions designed to produce or deliver goods and services that serve the needs of a particular competitive segment. A company usually follows focus strategy when it is able to serve a narrow piece of the market better than competitors. This strategy is successful when the company has the core competencies required to produce value to a narrow competitive segment that exceeds the value available from companies serving customers on an industry wide basis. A company can achieve a least-cost position or differentiator or both in the particular market segment (niche or focus).

Empirical Review

Few researchers have revealed existence of empirical connection between hardware infrastructure and supply chain 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 hardware as a dimension of information technology capability has positive and significant effect on competitive advantage of commercial banks in Kenya. For instance, Wali (2013) investigated the impact of compatibility and connectivity of Information Technology Infrastructure (ITI) on reliability and access of customer service delivery in the Nigeria commercial banks. The study selected 8 commercial banks out of the 20 commercial banks in Nigeria as to generalize her findings. The study conveniently selected 40 customers from the eight banks, thereafter a total of 40 copies of the questionnaire that is 5copies per banks was randomly distributed to the 40 customers of the banks and the 40 questionnaires were fully attended to and retrieved. Simple percentages, tables were used to analyze the respondent demographics, while the Spearman's rank order correlation

coefficient was used to analyze the four hypotheses; this was made easy with the use of statistical package for social sciences SPSS. The findings revealed that networks and communication infrastructure, database management infrastructure, hardware and software infrastructure have positive impact on reliability and access of customer service delivery. Roberts and Grover (2012) investigated how information technology (IT) infrastructure facilitates a firm's customer agility and, in turn, competitive activity. The study tested its model with a two-stage research design in which it surveyed marketing executives of high-tech firms. The results revealed that a network and communication infrastructure, database management infrastructure, hardware and software infrastructure facilitate a firm's customer-sensing capability and competitiveness. From the review of literature, the following research hypotheses were formulated.

Ho1: Hardware infrastructure does not significantly influence cost advantage of GSM service providers in Rivers State.

Ho2: Hardware infrastructure does not significantly influence differentiation of GSM service providers in Rivers State.

Ho3: Hardware infrastructure does not significantly influence market focus of GSM service prov

Source: SPSS Output, 2024

RESEARCH METHODOLOGY

This study embraced a causal design with hypotheses testing type of investigation. The study population comprised of the Four (4) GSM services providers operating in Rivers State namely, MTN, Airtel, Globacom and 9mobile that is registered with communication commission of Nigeria. The study adopted the census method and administered 9 copies of structured questionnaire to each of the (4) GSM service providers in Rivers State; this mean a total of 36 respondents was use for the study. Categories of persons that constituted the respondents was top management staff. After data cleaning only 31 copies of the questionnaire were used for the data analysis. Bivariate inferential statistic of regression analysis was used at the secondary level of analysis, to test the significance and influence of hard ware infrastructure on competitive advantage alongside their indicators or components with the help of statistical packages for social sciences (SPSS) version 23.0.

TABLE 1: DESCRIPTIVE STATISTICS OF HARDWARE INFRASTRUCTURE

	Scale Mean if Item Deleted	Scale Variance of Mean	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
We use several facilities to run our software applications	17.6375	4.285	.386	.196	.685
We use laptop and desktop computers	17.7000	3.732	.557	.525	.611
We use intercom	17.7875	4.068	.376	.408	.694
We use routers	17.5375	4.150	.527	.518	.632
We use CPUs, hard drive, CDs etc.	17.6375	4.107	.476	.442	.648

Table 1 depicts that high mean scores of the questionnaire items ranging over 3.00, this means that greater number of the respondents expressed very high and high extents of acceptance to the research question with respect to hardware infrastructure. However, it can be seen that question 1 which sought to determine the extent to which managers of GSM service providers in Rivers State use several facilities to run software applications, has the highest mean score of 4.28. This shows that question 1 has the strongest influence on the variables.

TABLE 2: DESCRIPTIVE STATISTICS OF COST ADVANTAGE

	N	Sum	Mean	Std. Deviation	Variance
We know our competitors' production and sales prices	136	542	3.99	1.223	1.496
We understand that customers are price sensitive, especially given the economic situation in the country	136	546	4.01	1.174	1.378
Our services are affordable/economical and of Good value	136	535	3.93	1.200	1.440
Our services are given at lower prices in relation to our competitors	136	545	4.01	1.347	1.815
Valid N (listwise)	136	578	4.25	1.210	1.463

Source: SPSS Output, 2024.

Table 2 depicts high mean scores of the questionnaire items ranging over 3.00, this means that greater number of the respondents expressed very high and high extents of acceptance to the research question with respect to cost advantage. However, it can be seen that question 5 which sought to determine the extent to which services are given at lower prices in relation to our competitors among GSM service providers in Rivers State, has the highest mean score of 4.25. This shows that question 5 has the strongest influence on the variables.

TABLE 3: DESCRIPTIVE STATISTICS OF DIFFERENTIATION

	N	Sum	Mean	Std. Deviation	Variance
Our services are unique within the Port Harcourt hospitality industry	136	540	3.97	1.211	1.466
Our services are highly inimitable	136	576	4.24	1.130	1.278
We serve our customers in ways distinct from competitors	136	563	4.14	1.048	1.099
Our emergency response unit is very fast	136	569	4.18	1.124	1.262
We are reputable for	136	570	4.19	.882	.778
Valid N (listwise)	136				

Source: SPSS Output, 2024.

Table 3 depicts high mean scores of the questionnaire items ranging over 3.00, this means that greater number of the respondents expressed very high and high extents of acceptance to the research question with respect to differentiation. However, it can be seen that question 2 which sought to determine the extent to which services are highly inimitable among GSM service providers in Rivers State, has the highest mean score of 4.24. This shows that question 2 has the strongest influence on the variables

Table 4: Descriptive Statistics of Market focus

	N	Sum	Mean	Std. Deviation	Variance
We have good understanding of the Nigerian hospitality industry	136	579	4.26	1.288	1.659
We have carved out a niche for us	136	590	4.34	1.212	1.470
Our firm strategically focuses its efforts on a target or some targets rather than the entire market.	136	606	4.46	1.179	1.391
We channel our time and efforts to effectively serve our target customers.	136	586	4.31	1.308	1.711
We use cost reduction strategy to focus on our target customers.	136	591	4.35	1.195	1.428
Valid N (listwise)	136				

Source: SPSS Output, 2024.

Table 4: depicts high mean scores of the questionnaire items ranging over 3.00, this means that greater number of the respondents expressed very high and high extents of acceptance to the research question with respect to market focus. However, it can be seen that question 3 which

sought to determine the extent to which firms strategically focus efforts on a target or some targets rather than the entire market among GSM service providers in Rivers State, has the highest mean score of 4.46. This shows that question 3 has the strongest influence on the variables.

TEST OF HYPOTHESES

Ho₁: Hardware infrastructure does not significantly influence cost advantage of GSM service providers in Rivers State.

Table 5: Model Summary of the influence of hardware infrastructure on cost advantage of GSM service providers in Rivers State.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.866 ^a	.751	.747	1.757
a. Predictors: (Constant), Hardware infrastructure				

The researcher performed a simple regression to predict the influence of hardware infrastructure on new cost advantage of GSM service providers in Rivers State. As shown on Table 5, hardware infrastructure has a very strong and positive influence on new cost advantage which is evident in the regression coefficient of 0.866. Again, the coefficient of determination (R Square) is 0.751. This means that, approximately 92% of the changes in new cost advantage were caused by hardware infrastructure, while the remaining 25% were attributable to the influence of external variables not included in the model.

Table 6: ANOVA^a of the influence of hardware infrastructure on cost advantage of GSM service providers in Rivers State.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	734.288	1	734.288	237.804	.000 ^b
	Residual	243.935	79	3.088		
	Total	978.222	80			

a. Dependent Variable: Market Share

b. Predictors: (Constant), Hardware infrastructure

The analysis of variance (ANOVA) in Table 6, shows that hardware infrastructure significantly influences new cost advantage as shown in the probability value of $0.001 < 0.01$. In other words, hardware infrastructure significantly influences new cost advantage at $F(1, 79) = 237.804$, $p = 0.001 < 0.01$, $R \text{ Square} = 0.751$. Thus, the analysis indicates that the regression model is a good fit for the data.

Table 7: Coefficients of the influence of hardware infrastructure on cost advantage of GSM service providers in Rivers State.

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.876	1.222		.717	.475
	Hardware infrastructure	.906	.059	.866	15.421	.000

a. Dependent Variable: Market Share

In Table 7, the unstandardized coefficients indicate how much the dependent variable - new cost advantage varies with the independent variables - hardware infrastructure. As shown in the Table, 1 percent increase in hardware infrastructure will bring about 0.906% percent increase in new market share.

Ho2: Hardware infrastructure does not significantly influence differentiation of GSM Service providers in Rivers State.

Table 8: Model Summary of the influence of hardware infrastructure on differentiation of GSM service providers in Rivers State.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.526 ^a	.277	.268	3.770

a. Predictors: (Constant), Hardware infrastructure

The researcher performed a simple regression to predict the influence of hardware infrastructure on differentiation of GSM service providers in Rivers State. As shown in Table 8, hardware infrastructure has a moderate and positive influence on differentiation which is evident in the regression coefficient of 0.526. Again, the coefficient of determination (R Square) is 0.277. This means that, approximately 28% of the changes in differentiation were caused by hardware infrastructure, while the remaining 72% were attributable to the influence of external variables not included in the model.

Table 9: ANOVA^a of the influence of hardware infrastructure on differentiation of GSM service providers in Rivers State.

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	429.449	1	429.449	30.222	.000 ^b
	Residual	1122.575	79	14.210		
	Total	1552.025	80			

a. Dependent Variable: Customer Satisfaction

b. Predictors: (Constant), Hardware infrastructure

The analysis of variance (ANOVA) in Table 9, shows that hardware infrastructure significantly influences differentiation as shown in the probability value of $0.001 < 0.01$. In other words, hardware infrastructure significantly influences differentiation at $F(1, 79) = 30.222$, $p = 0.001 < 0.01$, $R \text{ Square} = 0.277$. Thus, the analysis indicates that the regression model is a good fit for the data.

Table 10: Coefficients^a of the influence of hardware infrastructure on differentiation of GSM service providers in Rivers State.

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.500	2.622		1.335	.186
	Hardware infrastructure	.693	.126	.526	5.497	.000

a. Dependent Variable: Customer Satisfaction

In Table 10, the unstandardized coefficients indicate how much the dependent variable – differentiation varies with the independent variables - hardware infrastructure. As shown in the Table, 1 percent increase in hardware infrastructure will bring about 0.693% percent increase in customer satisfaction

Ho3: Hardware infrastructure does not significantly influence market focus of GSM service providers in Rivers State.

Table 11: Model Summary of the influence of hardware infrastructure on market focus of GSM service providers in Rivers State.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.727 ^a	.528	.522	2.452

a. Predictors: (Constant), Hardware infrastructure

The researcher performed a simple regression to predict the influence of hardware infrastructure on market focus of GSM service providers in Rivers State. As shown on Table 11, hardware infrastructure has a strong and positive influence on market focus which is evident in the regression coefficient of 0.727. Again, the coefficient of determination (R Square) is 0.528. This means that, approximately 53% of the changes in market focus were caused by hardware infrastructure, while the remaining 47% were attributable to the influence of external variables not included in the model.

Table 12: ANOVA^a of the influence of hardware infrastructure on market focus of GSM service providers in Rivers State.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	531.000	1	531.000	88.323	.000 ^b
	Residual	474.950	79	6.012		
	Total	1005.951	80			

a. Dependent Variable: Market focus

b. Predictors: (Constant), Hardware infrastructure

The analysis of variance (ANOVA) in Table 4.28 shows that hardware infrastructure significantly influences market focus as shown in the probability value of $0.001 < 0.01$. In other words, hardware infrastructure significantly influences market focus at $F(1, 79) = 88.323$, $p = 0.001 < 0.01$, $R \text{ Square} = 0.528$. Thus, the analysis indicates that the regression model is a good fit for the data.

Table 13: Coefficients^a of the influence of hardware infrastructure on market focus of GSM service providers in Rivers State.

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.154	1.705		1.263	.210
	Hardware infrastructure	.771	.082	.727	9.398	.000

a. Dependent Variable: Market focus

In Table 13, the unstandardized coefficients indicate how much the dependent variable - market focus varies with the independent variables - hardware infrastructure. As shown in the Table, 1 percent increase in hardware infrastructure will bring about 0.771% percent increase in market focus.

DISCUSSION OF FINDINGS

Findings from the analysis revealed that hardware infrastructure had a very strong and positive influence on new cost advantage which is evident in the regression coefficient of 0.866. Again, approximately 92% of the changes in new cost advantage were caused by hardware infrastructure, while the remaining 25% were attributable to the influence of external variables not included in the model. The analysis of variance (ANOVA) shows that hardware infrastructure significantly influences cost advantage as shown in the probability value of $0.001 < 0.01$. Similarly, the analysis revealed that hardware infrastructure has a moderate and positive influence on new differentiation which is evident in the regression coefficient of 0.526. It also showed that approximately 28% of the changes in new differentiation were caused by hardware infrastructure, while the remaining 72% were attributable to the influence of external variables not included in the model. The analysis of variance (ANOVA) shows that hardware infrastructure significantly influences differentiation as shown in the probability value of $0.001 < 0.01$. The analysis further revealed that hardware infrastructure has a strong and positive influence on market focus which is evident in the regression coefficient of 0.727. Again, approximately 53% of the changes in market focus were caused by Hardware Infrastructure, while the remaining 47% were attributable to the influence of external variables not included in the model. The analysis of variance (ANOVA) shows that hardware infrastructure significantly influences market focus as shown in the probability value of $0.001 < 0.01$.

Findings of the study corroborate with the empirical findings of several studies. For instance, Roberts and Grover (2012) who investigated how information technology (IT) infrastructure facilitates a firm's customer agility and, in turn competitive activity. The study tested its model with a two-stage research design in which it surveyed marketing executive of high technology firms. The results revealed that a network and communication infrastructure, database management infrastructure, hardware and

software infrastructure facilitate a firm's customer sensing capability and competitive advantage. Wali (2013) investigated the impact of compatibility and connectivity of information technology infrastructure (ITI) on reliability and access of customer service delivery in Nigeria commercial banks. The findings revealed that networks infrastructure, hardware and software infrastructure have positive impact on reliability and access of customer service delivery. Milimo, Sagwa and Sakwa (2015) empirically examined the influence of information technology infrastructure on supply chain performance of public Universities in Kenya. The results of the study indicate that information technology infrastructure dimension such as hardware has positive influence on supply chain performance in public universities in Kenya.

In line with the findings of this study and to the extent of its consistency with results of similar previous studies, we conclude that Hardware infrastructure had significant and positive influence on competitive advantage of GSM service providers in Rivers State. And therefore, recommended that GSM Service Providers should capitalize on the pivot role of Hardware infrastructure in their operations to enhance optimal cost advantage to attain overall operational effectiveness and operational efficiency.

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