



Technological Innovation as a Vital Force Towards Enhancement of Performance of Telecommunication Companies in Kenya

¹Dr. Headmound Okari & ²Dr. Benoit Katula

¹Technical University of Kenya (TUK) - School of Business and Management Studies- Nairobi, Kenya

²Université de l'Uélé (UNIUELE) - School of Economics and Management Sciences

ABSTRACT

Technology and technological innovation has taken a center stage in business competition and competitiveness. Major business success factors including; efficiency, product quality, cost management, flexibility, among others have been radically redefined by the recent developments in technology. This study aimed at analyzing the role of Technological innovation as an important factor towards enhancement of Performance of Telecommunication Companies in Kenya. To achieve this objective, the study used a survey research design as it was considered most appropriate in facilitating the collection of relevant information whose results were generalized to a defined population. The study used questionnaires and interview methods for primary data collection and document analysis as a source of secondary data. A sample of 93 respondents mainly top and middle level managers from 4 top telecommunication companies in Kenya was scientifically determined. A response rate of 90.3% was obtained. Data collected was analyzed using the SPSS software. In addition, spreadsheets were used to supplement the SPSS in areas such as the presentation of results using bar graphs, pie charts and frequency tables. The study established that technological innovation has a significant effect on the performance of telecommunication companies in Kenya. Among other recommendations, the study recommended that telecommunication companies in Kenya invest more in technological oriented strategies especially in product development and technological related forms of diversification towards enhancement and sustaining performance in such a competitive industry.

Keywords: Innovation, Performance, Telecommunication Companies

INTRODUCTION

Business Organizations have been facing a dynamic business environment that is technologically driven, globally unbounded, and customer oriented. These challenges, among others, call for extensive search for suitable strategies to be adopted by organizations for growth and survival in the changing and turbulent marketplace (Al-Mansour, 2007).

Chege (2008) contends that organizations are in stiff competition with each other and more so when they are selling similar products and services to the same group of customers. It becomes even stiffer if the style of business is almost rigid, thereby giving the players a little chance to diversify and play differently. Environmental forces largely influence competition within an industry especially those related in technology, economic forces social and cultural values.

In most parts of the world, telecommunication is fast growing industry and its effect can be felt literally in every aspect of society including; voice telephone, internet, high speed data communication, satellite communication, worldwide web, fax transmissions, video teleconferencing, and the list is endless. In Kenya, telecommunication industry is undergoing radical transformations catalyzed by the privatization

and de-monopolization of telecomm Kenya which for long was the only service provider in this sector. According to the World Bank economic update 2010, the information and technology sector in Kenya has emerged as a steadily growing contributor to the Kenya economy. The document further observes that the industry has outperformed all other in the Kenyan economy, growing on average by approximately 20% annually. One of the major hinges informing the growth of the telecommunication industry in Kenya is technology and therefore players in this sector are all trying to position themselves in exploiting the immense opportunities that technology presents.

Statement of the Problem

Global Technological development has had a huge impact in the way businesses are done from processing, end product, marketing, delivery until consumption. Multiple business strategies have been victims of the rapid emergence of what Hill (2010) terms as technological paradigm shifts. Business strategies have had difficult times coping with the rapid emergence of technologically related paradigm shifts, both in terms of strategy formulation and execution, mainly due to the rapid base at which these shifts take place. This implies that any organization that aspires to hold a leading position in such a turbulent market environment must have a clear technological innovation strategy.

The Kenya Telecommunication Report 2013 by Business Monitor International, Kenya's telecommunication industry is one of the most dynamic in the region. With the advent of liberalization, and entry into the industry of new players, the competition among the various players in Kenya's telecommunication industry has become so stiff that only those companies with the best strategies are able to survive and position themselves at the lead.

According to the CCK report 2012, various components of telecommunication industry have continued to be on an upward pedestal. For instance, the mobile money transfers, data/internet market among others. However, the same report observes that the fixed line network market continued to record a downward trend and same was observed in the postal and courier sector.

Business Monitor International in its report Kenya Telecommunication Report 2013, Forecasts observes that Kenyan telecommunication sector is threatened by weak financial performance by most of the operators on the back of declining revenues and rising operating costs. The same report notices that mobile operators need to implement new revenue growth and efficient strategies in order to maintain competitiveness in the market. For telecommunication companies in Kenya to improve their performance especially financial, they have to necessarily find new ways to expand their products and grow demand for them. Among major possible boosts for performance is the identification and exploitation of the technological oriented opportunities with the hope of enhancing their performance.

Theoretical and Empirical Literature Review

The study was anchored on the Resource based view theory (RBV) which distinguishes firms in terms of their strategic and resource endowments and stresses the uniqueness of every organization. This approach assumes that an organization can attain superior capabilities by creating new resources or modifying the existing ones towards attaining certain unique features and in this was structure and or change the rules of the competitive game (Wernerfelt, 1984; Peteraf, 1993). According to Stalk, et al. (1992) the key to success is no longer where a company chooses to compete but how the firm's unique resources and capabilities dictate strategy and lead to success.

Barney (1991) argues that a resource is strategic and therefore likely to give a company a competitive edge if it has given specific characteristics which include; valuability meaning the capacity to increase the organizations' effectiveness and efficiency, when the resource is rare and in high demand, inimitability and substitutability. From this theory perspective, a telecommunication company endowed with or that acquires resource of the stated features stand a high chance to position itself as a market leader in the industry.

Hill (2010) argues that technological paradigm shifts occur when new technologies come along that revolutionize the structure of the industry, dramatically alters the nature of competition, and require

companies to adopt new strategies to survive. In Kenya, technological advancements in the financial services sector have been revolutionalized by Safaricom's MPESA services. Hill (2010) observes that technological paradigm shifts appear to be more likely to occur in an industry when one, or both, of the following conditions are in place. One, when the established technology in the industry is mature and approaching or at its "natural limit" and second, "disruptive technology" has entered the market place and is taking root in niches that are poorly served by incumbent using established technology. Technology exerts a significant influence on the ability to innovate and is viewed both as a major source of competitive advantage and of new product innovation (Gunasekeran et al., 1996).

Han (2001) states that some innovations are built on existing products, services, or procedure and are incremental in nature while others entail greater degrees of difference and more radical than incremental. According to Adam and Farber, (2000), technological innovation in the organizational context, may be linked to performance and growth through improvements in efficiency, productivity, quality, competitive positioning and market share among others.

In a study by Solomon et al. (2012) on "technological innovation and corporate performance", existing literatures were reviewed to establish the relationship between technological innovations and perceived performance improvement. The study found out that there exists a close relationship between technological innovation and corporate performance, and that firms that embraced technological advancements were more likely to be successful in their corporate performance as opposed to those that did not succeed. With this trend, technology and technological innovation is a necessary prerequisite for organizational success. Despite the costs associated with the implementation of technological methods of operations, the benefits are more than the costs, hence presenting overall improved performance and efficient use of resources.

RESEARCH METHODOLOGY

The study aimed at investigating the role of technological innovation towards enhancement of Performance of Telecommunication Companies in Kenya. To achieve this objective, the study used a survey research design as it was considered most appropriate in facilitating the collection of relevant information whose results were generalized to a defined population. The sampling frame for the study consisted of top and middle level managers of leading telecommunication companies in Kenya and a sample of 93 respondents were scientifically determined. The study used questionnaires and interview methods for primary data collection and document analysis as a source of secondary data. The study used sampling considering it could be difficult studying all companies in the telecommunication industry. A response rate of 90.3% was obtained. Data collected was analyzed using the SPSS software. In addition, spreadsheets were used to supplement the SPSS in areas such as the presentation of results using bar graphs, pie charts and frequency tables.

DATA ANALYSIS, PRESENTATION AND DISCUSSION

Reliability test on dependent variable (Performance)

The study sought determine the reliability using Cronbach's type of reliability coefficient. From the findings summarized in Table 1, dependent variable (performance) was found to be reliable at a Cronbach's Alpha of .902.

Table 1: Reliability Coefficient for dependent variable (Performance)

Reliability Statistics	
Cronbach's Alpha	N of Items
.902	12

Factor Analysis on Dependent Variable (Performance)

The study wanted to establish if all the factors for dependent variable performance would load highly. Table 2 below shows that none of the factors had a factor value of less than the required threshold of .4.

Table 2: Factor Analysis on the dependent variable (Performance of the Company)

Component Matrix ^a	
	Component
	1
Employee retention rate	.788
Network geographical distribution	.773
Technological capacity	.721
Number of subscribers	.712
Average revenue	.702
Average profits	.685
Number of patents	.678
Asset base	.674
Market share	.666
Number of permanent employees	.665
Quality of employees	.654
Quality of infrastructure/facilities	.640

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Descriptive Statistics for Dependent Variable (Performance)

The research had to do a descriptive statistics of the dependent variable (performance of the company). From the findings summarized in Table 3, 41.7% said the status of the number of subscribers was average, 45.2% said that asset base was good, 42.9% said number of permanent employees was average, 35.7% said the profits were average in comparison with industry, 42.9% said number of patents was average, 35.7% said average on the average revenue, 51.2% said average on the market share, 40.5% rated network geographical distribution at average, 46.4% said quality of infrastructure/facilities was average, 50.0% said employee retention rate was average, 39.3 % rated quality of employees as average, 46.4% rated average the technological capacity.

Table 3: Descriptive statistics for performance of the company

	Poor	Fair	Average	Good	Very good
Number of subscribers	6.0%	13.1%	41.7%	38.1%	1.2%
Asset base	3.6%	14.3%	31.0%	45.2%	6.0%
Number of permanent employees	7.1%	14.3%	42.9%	27.4%	8.3%
Average profits	4.8%	19.0%	35.7%	31.0%	9.5%
Number of patents	6.0%	27.4%	42.9%	21.4%	2.4%
Average revenue	6.0%	27.4%	35.7%	28.6%	2.4%
Market share	6.0%	27.4%	51.2%	14.3%	1.2%
Network geographical distribution	7.1%	20.2%	40.5%	25.0%	7.1%
Quality of Infrastructure/facilities	4.8%	21.4%	46.4%	23.8%	3.6%
Employee retention rate	7.1%	15.5%	50.0%	21.4%	6.0%
Quality of employees	4.8%	26.2%	39.3%	27.4%	2.4%
Technological capacity	2.4%	20.2%	46.4%	25.0%	6.0%

Reliability Test on Technological Innovation

The study sought to establish the reliability coefficient of technological innovation using Cronbach's type of reliability coefficient. The findings summarized in Table 4 Show that, technological innovation was found to be reliable at a Cronbach's Alpha of .747.

Table 4: Reliability Coefficient for Technological Innovation

Reliability Statistics	
Cronbach's Alpha	N of Items
.747	4

Factor Analysis on Technological Innovation

The study sought to establish whether all the factors for technological innovation would load highly. Table 5 below shows that all the factors had a factor value of above the required threshold of .4

Table 5: Factor Analysis on Technological Innovation

Component Matrix ^a	
	Component 1
The company encourages and rewards new technological ideas	.795
The company has a comprehensive strategy on technological innovation	.780
The company has invested in Research and Development to enhance technological innovation	.749
The company has invested in the latest technological infrastructure in the industry	.691

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Descriptive Statistics for Technological Innovation

The study sought to find the descriptive statistics of technological innovation. The findings were summarized as indicated on Table 6. From the table, the findings show that 50.0% of the respondent said

the company has invested in Research and Development to enhance technological innovation to a large extent, 50.0% said to a large extent the company encourages and rewards new technological ideas, 42.9% said to a very large extent, the company has invested in the latest technological infrastructure in the industry, and 47.6% said to a large extent the company has a comprehensive strategy on technological innovation. According to Gunasekeran *et al.* (1996), technology exerts a significant influence on the ability to innovate and is viewed both as a major source of competitive advantage and of new product innovation.

Table 6: Descriptive Statistics for Technological Innovation

	Not at all	Little extent	Moderate extent	To a large extent	To a very large extent
The company has invested in Research and Development to enhance technological innovation	1.2%	2.4%	21.4%	50.0%	25.0%
The company encourages and rewards new technological ideas	0.0%	3.6%	19.0%	50.0%	27.4%
The company has invested in the latest technological infrastructure in the industry	0.0%	2.4%	16.7%	38.1%	42.9%
The company has a comprehensive strategy on technological innovation	1.2%	4.8%	29.8%	47.6%	16.7%

Checking for Linearity

Before carrying out regression analysis, the study sought to find out if a linear relationship existed between the dependent variable (performance of the company) and independent variable (technological innovation). From the Figure 1, the study concluded that a positive linear relationship exists between the dependent and independent variable (technological innovation).

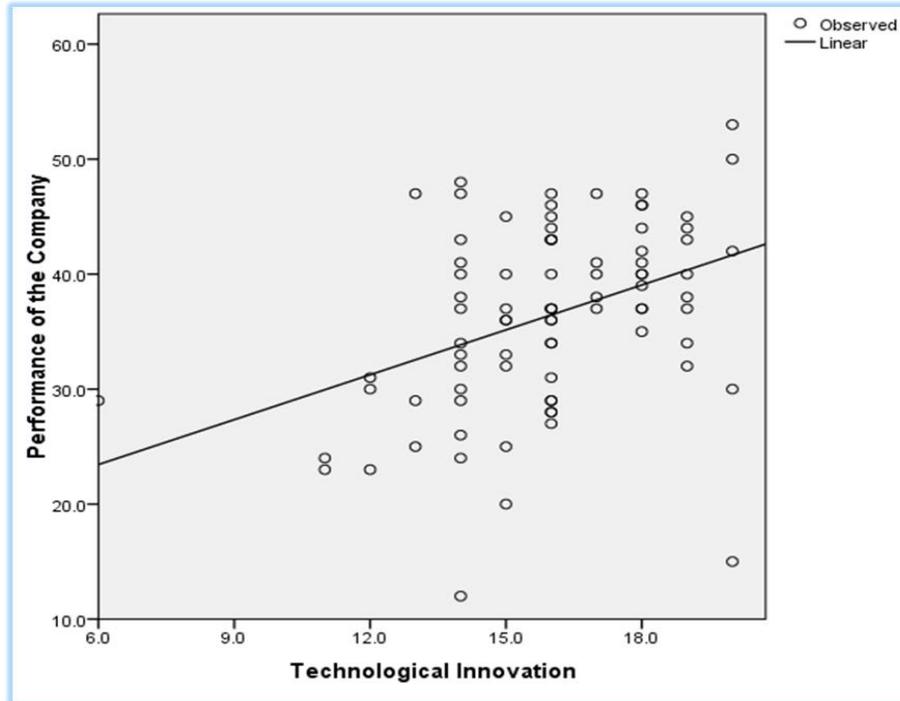


Figure 1: Checking for Linearity in the variable, technological innovation

Correlation between Technological Innovation and Performance of the Company

The study carried out correlation analysis to determine the relationship between performance of the company and technological innovation. The findings presented in Table 7 show that a statistically significant positive ($P = .394$; $p = .000$) relationship existed between performance of the company and technological innovation. These findings indicate that as technological innovation strengthens, performance of the company also increases with the same magnitude. These findings confirm those of Kim and Mauborne (1999) who found that, organizations that are able to combine customer value and innovation with technology innovation have a higher likely chance of enjoying sustainable growth and profitability.

Table 7: Correlation between Technological Innovation and Performance of the Company
Correlations

		Performance of the Company	Technological Innovation
Performance of the Company	Pearson Correlation	1	.394**
	Sig. (2-tailed)		.000
	N	84	84
Technological Innovation	Pearson Correlation	.394**	1
	Sig. (2-tailed)	.000	
	N	84	84

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

Regression of Technological Innovation and Performance of the Company

The study carried out a regression analysis to determine the influence that technological innovation has on performance of the company. From the Model Summary Table 8 the study established that technological innovation contributes 15.5% of the total variance in the dependent variable (performance of the company).

Table 8: Model Summary Table for performance and technological innovation

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.394 ^a	.155	.145	7.47796

a. Predictors: (Constant), Technological Innovation

ANOVA Table 9 shows that the variability in the dependent variable as a result of the influence that technological innovation had on it, was statistically significant. Further, the null hypothesis that technological innovation does not have a significant influence on performance of the company is rejected and instead the alternative hypothesis that technological innovation has significant influence on the performance of the company is accepted. According to Abernathy and Utterback (2005), the primary goal of technological innovation is to assure the survival of the entity, as well as the business ecosystem, which in turn is based on achieving sustainable performance.

Table 9: ANOVA table of performance of the company and technological innovation

ANOVA^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	843.560	1	843.560	15.085	.000 ^b
	Residual	4585.428	82	55.920		
	Total	5428.988	83			

a. Dependent Variable: Performance of the Company

b. Predictors: (Constant), Technological Innovation

The Coefficient Table 10 shows that technological innovation contributes a statistically significant value of 1.301 for every unit increase in performance of the company.

Table 10: Coefficient table of performance and technological innovation

Coefficients^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	15.638	5.393		2.900	.005
	Technological Innovation	1.301	.335	.394	3.884	.000

a. Dependent Variable: Performance of the Company

Summary of findings

From the findings on the technological innovation, a majority of the respondent agreed that the company had invested in Research and Development to enhance technological innovation to a large extent, to a large extent the company encourages and rewards new technological ideas, to a very large extent the company had invested in the latest technological infrastructure in the industry, and to a large extent the company has a comprehensive strategy on technological innovation. The study also found that technological innovation had a positive and statistically significant relationship with performance of the company. In addition, the model summary showed that technological innovation contributes 15.5% of the total variability in the dependent variable (performance of the company). Further, the null hypothesis that technological innovation does not have a significant influence on the performance of the company was rejected and the alternative hypothesis was accepted, as p-value was less than .05

CONCLUSION

According to Abernathy and Utterback (2005), the primary goal of technological innovation is to assure the survival of the entity, as well as the business ecosystem, which in turn is based on achieving sustainable performance. From the summary of the findings on the technological innovation, the study concluded that telecommunication companies in Kenya have invested in Research and Development to enhance technological innovation, encourage and reward new technological ideas, the companies have invested in the latest technological infrastructure in the industry, and that the companies have a robust technological innovation strategy. The study concluded that, performance of the telecommunication companies significantly depended on among other factors; technological innovation. This conclusion collaborates with that of Kim and Mauborne (1999) who found that, organizations that are able to combine customer value and innovation with technology innovation have a likely higher chance of enjoying sustainable growth and profitability. The study therefore recommends that telecommunication companies in Kenya invest more in technological oriented strategies especially in product development and technological related forms of diversification towards enhancement and sustaining performance in such a competitive industry.

REFERENCES

- Amir, A.S., (2007). Competitive strategies adopted by petroleum retail stations in Kenya: A case of Mombasa City. *Unpublished MBA Project*: University of Nairobi.
- Arvidsson, Å., Hederstierna A., and Hellmer, S. (2005). *Forecasting Cellular Mobile Traffic: An Econometric Approach*. Sweden: Blekinge Institute of Technology, School of Management.
- Caroline, B. L., (2008). Achieving Superior Financial Performance in China: Differentiation, Cost Leadership, or Both? *Journal of International Marketing*, 16(3): 1 -22. Adam, M.,
- Farber, A. and Khallil, T, (2000). Financing Technological Innovation. *Management of Technology II*. Institute of Industrial Engineers. USA.
- Davial, T and Epstein, R.(2006). *Making Innovation Work, Howe to manage it, Measure it, and Profit from It*. Upper Saddle River. Wharton School Publishing.
- Gunasekaran, A., Okko, P. (2006). Improving Productivity and Quality in Small and MEDIUM
- Kim, W. and Mauborgene, R. (1999). *Strategy, Value Innovation and Knowledge Economy*. Sloan Management Review. Spring, Vol. 40. No., 3.
- Letangule, S. and Letting, N.(2012). *Effect of Innovation Strategies on Performance of Firms in the Telecommunication Sector in Kenya*. *International Journal of Management and Business Studies* vol. 2. Issue 3.
- Santos, B. and Peffers, K. (1993). *The Effects of Early Adoption of Information Technology: An Empirical Review*. *Journal of Information Technology Management*, Vol. IV No. 1
- Utterback, J., Abernathy, W. (2005) *Dynamic Model of Process and Product Innovation*. *Omega*. Vol. 3 No.6.