Innovation Strategies’ Influence on Competitive Advantage in Telecommunication Companies in Kenya

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Abstract

Intense competition in the global telecommunications field has resulted in heavy investments in innovative approaches to remain competitive. Kenya has followed this global trend following the liberalization of market operations. This article highlights how innovation strategies influence the competitive advantage of telecommunication companies in Kenya. Specifically, the study’s objectives were based on how product innovation, process innovation, technological innovation, and market innovation influence the competitive advantage of telecommunication companies in Kenya. The study used a descriptive design to sample 26 licensed telecommunications targeting 311 management staff. The proportionate sampling yielded 247 responses. Using linear regression analysis run through the SPSS computer program, the results show that innovation strategies statistically influence the competitive advantage of telecommunication companies in Kenya with a beta of .376 (β = .376, t = 6.613, p<.05). The study concludes that innovation strategies, if well harnessed, provide a platform for achieving competitive advantage over the long term. Innovation theories are truly supportive of the dynamic application of innovation strategies within telecommunication companies actively seizing any such opportunities in the short term. Undeniably, translation into competitive advantage will depend on the aggressiveness of each individual company. The study recommends that firms should create and maintain special teams to lead implementation of innovative strategies in order to attain competitive advantage in the telecommunications sector.

Keywords: Telecommunication, Product Innovation, Process Innovation, Technological Innovation, Market Innovation, Competitive Advantage, Kenya

Introduction

Innovation influences the competitive advantage of telecommunication companies worldwide. High demand for new generation services across various markets means companies constantly push their newfound innovations to their customers. However, there is evidence that not all attempts are bearing fruit, as seen in the high collapse rate in many upstart companies attributed to failure to adapt to the highly competitive free-market environment. Cases of companies failing to sustain mergers and adapt to new technologies have led to the realization that not all innovations are a success in all markets. Failure or success depends on these companies’ ability to compete in the tough market environment. Competitive advantage translates into market leadership if sustained by a firm as long as they can maintain the rarity of the assets and attributes that provide that competitiveness. The origins of competitive advantage trace back to Porter (1985). Whenever a firm gains a competitive advantage, there is apparent negativity of competition from its market rivals. This forces both the leader and the competitors to seek
for the key source of cost leadership or differentiation that fosters that competitive advantage (Walley & Thwaites, 1996).

One source of competitive advantage is technology and innovation (Aghion, Bergeaud, Bopparrt, Klenow& Li, 2019). Due to the heavy investment needed for technological innovations, firms require an economy full of entrepreneurship and to strictly keep limited budgets for research and development to sustain both present and future innovations (Wang et al., 2011). Major examples of countries with high entrepreneurial skills include the USA, Japan, and Germany who have many businesses in the global market, thus, maintaining sustainable competitive advantage (Walley & Thwaites, 1996; Stonehouse & Snowdon, 2007). While researchers have conducted many studies on innovation and competitive advantage in the developed nations, the ever-changing nature of technology and user preferences has brought to the fore a need to do similar studies in developing countries. This article investigates the impact innovative strategies have had on the competitive advantage of telecommunication companies in Kenya.

**Competitive Advantage**

According to Anning-Dorson (2018), a firm achieves competitive advantage through creation of superior products, that is, differentiation advantage or lower production cost, that is, cost advantage. The focus of this paper is, therefore, to establish the role played by innovative strategies in the telecommunications companies of Kenya.

Over the past 20 years, the telecommunications industry has become very vibrant following various measures of market liberalization that governments across the world have initiated. Such liberalization means innovation provides a link between regional partners, global rules and local adaptation in the running of the telecommunications industry (Adeolu, 2017). The cutthroat competition implies that free-market forces have to dictate what innovative strategies rule the market, and companies may find themselves redundant or simply not competitive enough. This is true for both developed and developing markets (Tyagi, 2019).

**Telecommunication in Kenya**

The telecommunications market in Kenya has considerable growth potential due to its previous low diffusion in the mobile and fixed markets (CAK, 2017). In the past, the state-owned telecommunications enterprise, Telkom, had a monopoly in the industry. Initially, fixed-line systems were dominant, making Telkom and corresponding rivals in the region the most competitive in the sector. However, Telkom Kenya and similar operators across the continent lost dominance in the fixed line as well as the international bandwidth sectors. Licenses were delivered to a regional carrier involving a third mobile operator together with numerous new data carriers, which marked a very important change in the competitive scene for telecommunications services across the country (CAK, 2017). The government set up the regulatory authority for Kenya’s telecommunication industry, the Communications Authority of Kenya (CAK), pointedly licensing and accrediting three major firms to roll out key mobile network operations, that is, Safaricom Ltd (with 70% of the market share in terms of subscribers, minutes and revenue), Airtel Kenya and Telkom Kenya (CAK, 2019). Consequently, the competition has been very stiff with the entry of more firms licensed by the CAK demanding all players to employ various innovative and competitive strategies in order to survive in the industry (David, 2019). The continuous growth in the telecommunications sector is a vibrant indication of the increased focus by operators to provide innovative and competitive products and services that attract consumers (Adede et al., 2017).
Technology, Product, Market and Process Innovation Strategies

Although competitive advantage has arisen from the main strategies of cost leadership and differentiation, the real driver of competitiveness lies in the innovation strategies created. Product differentiation, in particular, has played a role in the Kenyan telecommunications market with Safaricom creating the Mpesa product which has been a long-time leading product while Airtel and rival companies have tried the cost leadership strategy to sustain their competitive advantage in the Kenyan and regional market (David, 2019). The technological innovations introduced in Kenya’s telecommunications market have involved the movement from fixed-line technology to mobile phone technology as well as from 2G to 4G modes. On the other hand, market innovations have focused on serving low-cost markets targeting the masses as perfected by Safaricom, whose customers, especially the low-income earners, use their services for all their operations. Process innovations include sales point payments that ease the carrying of lots of cash by customers and increase convenience in the purchasing processes. The sustainability of these innovation strategies comes at a cost and some firms have performed poorly while others are thriving (Kingiri & Fu, 2020).

Problem Statement

Various studies indicate that Kenya’s telecommunications sector is one of the most competitive in the East African and wider African region with reports indicating that competition is driven by high product, market, technology, and process innovations. Similarly, studies on the global front indicate that failure to harmonise innovations has contributed to the low penetration by specific competitors for example in the European Union zones where entry requires demonstration of high standards and clear understanding of the innovative strategies (Berne et al., 2019). In Asia, the introduction of innovative products in Korea and China’s telecommunication sector has led to highly competitive markets (Carver, 2018; Deng et al., 2013; Hassan et al., 2013; Kim et al., 2016). The same situation is replicated regionally across the African continent where innovations have played a key role in creating competitive advantage for telecommunication companies in Nigeria, Uganda and South Africa (Moshi & Mwakatumbula, 2017). The Kenyan situation is in many ways similar to the global and regional situation in which there is dynamism in the market and firms focus on innovative strategies to remain in the lead (Kingiri & Fu, 2020). From the foregoing studies, innovation strategies have inspired a further review of their influence on the competitive advantage of telecommunication companies in Kenya. The key question in the field was, “Do innovation strategies influence the competitive advantage of telecommunication companies in Kenya?”

Literature Review

Theoretical Foundation of Innovation Strategies

The key theories that anchor innovation across the telecommunications industry are the disruptive theory and disruptive innovations theory. Christensen (2000) posits that disruptive innovations bring quantum changes in any given environment. Additionally, Li, Porter and Suominen (2018) emphasize that reputable products can be incremental. Tyagi (2019) further notes that sustainable technology creates innovations that are alterations, improved increments or marked changes in the mode and means of usage around a company. The comparative term for this phenomenon is simply expert revolution that helps sustain the technological world (Millar, Lockett & Ladd, 2018).

Scholars also argue that the aptitude of incumbents to grow and advertise disruptive innovations is due to their detailed ambidexterity, competence-destroying and competence-enhancing, based on simultaneous investigative and manipulative activities to support both
incremental and essential innovations (Arifin, 2019; David, 2019; Li et al., 2019). Generally, disruptive innovations change consumers’ habits in markets in addition to undermining the capabilities and corresponding possessions of existing producers (Kim, Chang, Wong & Park, 2020). Dachset et al., (2017) contends that if supporting innovation pushes an item through to the open market, then it is a present innovation with new qualities that will offer another key change in light of the clients or association's demand.

Christensen (1995) defines disruptive innovation as a procedure through which a product or service flourish at the bottom level of a relatively mature market and then persistently moves up the market levels dislodging established competitors in the process (Vecchiato, 2017). This implies that novel markets have value addition networks that open avenues for creation of alliances where firms lead the process with an orientation towards competitive advantage.

The disruptive innovation theory is most applicable to the current study as far as new technology is concerned. The telecommunications industry is highly driven by innovation and new processes towards competitive advantage, hence the importance of underpinning this study on this theory.

**Empirical Review**

Several studies have been carried out depicting the importance of innovation strategies on the telecommunications market with scholars indicating both the advantages and disadvantages of each strategy. Aside from bringing new products into the market, innovation strategies come up with processes for these markets that previously seemed most unlikely. The survival of companies in the competitive market also demonstrates the need to understand innovation strategies to stand a chance of remaining profitably competitive.

**Product Innovation**

Product innovation entails the introduction to a market of new services and goods that represent verifiable enhancements. Typically, such innovation means a visibly modified nature of the product where many features and identifiable parts of the product make sensible application to the users at least in the immediate or existing market (Leeuwen et al., 2010). On the other hand, according to OECD (2015), product innovation refers to a change in blueprint that brings considerable change in the anticipated use or distinctiveness of the product. When changes involve innovation that is concentrated on a product, it is then called product innovation. This is manifested through the institution of a completely new product, the adjustment of design for conventional products or the use of new ingredients in a conventional product (Su & Tang, 2016). Product innovation alludes to the introduction of new merchandise and enterprises or presenting a noteworthy upgrade in the present product or its administration. For product development to happen, the products should either be new or extensively enhanced with respect to the current features, and easy to use parts and materials (Leeuwen et al., 2010). The introduction of Mpesa by Safaricom, a mobile money transfer platform in Kenya, is an example of product innovation and an instance of product development.

**Process Innovation**

Process innovation is perhaps one of the key areas of competitive strategy that is hard to replicate especially by competitors. Whenever a new technique is introduced to accomplish a specific task, the initiating exercise is called process innovation and this could lead to competitive advantage for the initiating company (Yeboah-Asiamah, Quaye & Nimako, 2016). Moreover, if such a change leads to new markets, then there is increased competitive advantage.
for the initiating firm (Trubunikov, 2019). If process innovation is well guarded and fully developed, it can always lead to increased chances of improved productivity (Rochina-Barrachina et al. 2010). Process innovation is intended for achieving internal production goals, such as reducing cost of production and product enhancement. While product innovation has received much focus from researchers, it is observed that process innovation, even though it creates and sustains an organizations’ competitive advantage, has received little attention from researchers (Hervas-Oliver et al., 2012).

Technological Innovation
To the common eye, the changes in technology would represent all the innovations happening in the telecommunications industry. However, this is not the case although technological innovations do play a critical role in providing the competitive advantage of firms in the industry. Technological innovation as an opening of new ways of doing things will always elicit different views from service users (Castello, 2019). This technical inventiveness normally bases its success on the market environment in which an advantage is gained through its application. In essence, the technological innovation forecasts an exploitable opportunity that would enable a firm beat the competition over some period (David, 2019). However simplistic the technological innovation is, there is always need to have some form of protection for such innovations and this calls for protection of these innovations. If well-guarded and sustained, technological innovations have a tendency to reduce human dependency and, specifically, the manual mode of doing things. In the long run, technological innovations enable a firm unleash more power in the human resource sector (Haneda & Ito, 2018).

Market Innovation
The traditional changes that globally signaled strength on the market was creation of new markets. Market innovation is an additional dimension of modernization that is thought of as the efforts and resources concentrated to new sales methods in business (Medrano & Olarte-Pascual, 2016). Market innovation has been driven by intense competition in the market that has led to companies trying to cut a niche in the market for their product and services. According to Song (2019), the innovations that involve both designing and technology enhancement present new products and services geared towards a specific market and this continues to sustain the universal drive for innovation.

Conceptual Framework
The study focused on the impact of innovative strategies on the competitive advantage of telecommunications of Kenya with the competitive advantage forming the dependent variable while innovative strategies forming the independent variables as presented in Figure 1.
**Study Hypothesis**
The study applied a null hypothesis as follows:

\[ H_0: \text{Innovation strategies do not influence the competitive advantage of telecommunication companies in Kenya.} \]

**Operationalization of Study Variables**
The study variables were operationalized as indicated in Table 1 showing indicators and measurements for each variable.

**Table 1: Operationalization of Study Variables**

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Dimension</th>
<th>Indicator</th>
<th>Key Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Innovation (X2)</td>
<td>Procedural</td>
<td>Service Delivery</td>
<td>Michael (2014)</td>
</tr>
<tr>
<td>Technology Innovation (X3)</td>
<td>Procedural</td>
<td>GSM Networks</td>
<td>Haneda &amp; Ito (2018)</td>
</tr>
<tr>
<td>Market Innovation (X4)</td>
<td>Procedural</td>
<td>Adverts and Promos</td>
<td>Sun and Lee (2013)</td>
</tr>
<tr>
<td>Competitive Advantage (Y)</td>
<td>Firm assets and innovations</td>
<td>Market share</td>
<td>Porter (2008)</td>
</tr>
</tbody>
</table>
Research Methodology
Research Philosophy
This study took an empirical approach. Specifically, the study adopted the positivism research philosophy, where subjective and quantitative information was utilized to accomplish triangulation. Through positivism, one's decision to be creative becomes enhanced (Creswell & Poth, 2018). The research design used was descriptive design configuration utilizing both quantitative and qualitative methodologies (Bryman, 2012).

Population and Sample Data Collection
The study’s population comprised all the 26 telecommunication companies enlisted by the Communication Authority of Kenya (2019). The total number of managers in these companies was 8,689 and by using Cochran’s formula two-step sampling, the total sample size obtained was 311. The top ten companies on the index enjoy a market share of more than 97.5%, hence proportionate sampling was used to obtain the sample size for each company, that is, 247 managers from the 26 telecommunication companies. Questionnaires were distributed to employees by hand and they were requested to fill out the forms during the day. Further, empty envelopes were given to the participants to enclose the questionnaire, as a way of trust on their anonymity. After data cleaning, collected data was analyzed using factor analysis to determine the influence of innovation strategies on the competitive advantage of telecommunication companies in Kenya. The study used exploratory factor analysis (EFA) with a focus on the principle component analysis method (PCA). The exploratory factor analysis was performed to: extract the pattern matrix that informed the viability of constructs included in the study, identify the questions on each matrix, and determine the strength of the sampling adequacy. The questions that did not fit the matrix were dropped. Kaiser-Meyer-Olkin (KMO) of sampling adequacy and Bartlett’s test of Sphericity was used. The two outputs shows the independent variable factors were adequate for extraction since Kaiser-Meyer-Olkin measure was greater than 0.6 and the Bartlett’s test was significant ($p<.05$).

Reliability and Validity
In order to test the study instrument, a pilot study was undertaken specifically establishing the reliability and validity of the same. The reliability took into consideration the value of Cronbach's alpha ($\alpha$) for reliability. This involves internal consistency techniques anchored on Cronbach’s alpha. The alpha value ranges between 0 and 1 with reliability increasing with every increase in value. Coefficient of 0.6-0.7 is a commonly accepted rule of thumb that indicates acceptable reliability and 0.8 or higher indicates good reliability (Creswell & Poth, 2014). As indicated in Table 2, Cronbach’s alpha ($\alpha$) as $>.7$ shows all the four constructs were reliable. The validity of the constructs was determined by content validity and construct validity. As indicated in Table 2, construct validity was tested using the composite value. The value of the composite test was $>.7$ indicating that all the variables in the study attained construct validity. The study also tested content validity applying Average Variance Extracted (AVE) obtaining a measurement of $=>.5$. This was an indication that the measurement scales revealed a satisfactory measurement of content validity.
Table 2: Reliability and Validity of the Study Instrument

<table>
<thead>
<tr>
<th>Innovation Strategy</th>
<th>Composite value</th>
<th>No. of Items</th>
<th>Cronbach's alpha</th>
<th>Average Variance Extracted (AVE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Innovation</td>
<td>0.904</td>
<td>3</td>
<td>0.717 (.7)</td>
<td>0.613</td>
</tr>
<tr>
<td>Process Innovation</td>
<td>0.812</td>
<td>3</td>
<td>0.888</td>
<td>0.645</td>
</tr>
<tr>
<td>Technology Innovation</td>
<td>0.889</td>
<td>3</td>
<td>0.658 (.7)</td>
<td>0.619</td>
</tr>
<tr>
<td>Market Innovation</td>
<td>0.824</td>
<td>2</td>
<td>0.911</td>
<td>0.712</td>
</tr>
<tr>
<td>Competitive Advantage</td>
<td>0.897</td>
<td>3</td>
<td>0.812</td>
<td>0.730</td>
</tr>
</tbody>
</table>

Data Analyses and Interpretation
The field data was first run through various tests to establish the viability of the data commencing with key statistics. The study analyzed data using factor analysis and regression modeling producing results to verify the relationship between innovation strategies and competitive advantage. The principal component matrix obtained after the explanatory factor analysis was subjected to varimax rotation (Saunders, Lewis & Thornhill, 2016; Sekaran & Bougie, 2016). All the data crunching processes were run on the computer program SPSS version 26.

Results
Demographic Information
Proportionate sampling yielded 247 responses, out of the 311 questionnaires sampled, from mid and top-level managers in 26 telecommunication companies in Kenya. That was 79.4% of the target respondents. The total respondents were 56% male participants and 44% female participants. This shows a 50% gender balance in the management team in the telecommunications industry. Most managers in the telecommunications industry were aged between 24-35 years at 32%, followed by those aged 36-45 years at 26%, below 25 years old were at 15%, 46-55year-olds were at 10% and those over 55 years were the least at 1%. Cumulatively, more than half of the managers were aged between 25-45 years at 58%. Uniquely, 15% of the managers were below 25 years old, which is different in other industries.

Factor Analysis of Innovation Strategies
One key test for the study independent variables was factor analysis. The factor loadings for the questions representing the four innovation strategy components were greater than 0.5 as shown in Table 3. Further, the average of the components was calculated and the transformed data had a stronger component of 0.78. This value was greater than the least factor loading value of .624. This shows that the component loadings that informed the pattern matrix were stronger.
The current study utilized exploratory factor analysis (EFA) focusing on the principle component analysis method. This was specifically done to extract the pattern matrix that informed the viability of constructs included in the study, identify the questions on each matrix, and determine the strength of the sampling adequacy. The questions that did not fit the matrix were dropped. As indicated in Table 4, the Kaiser-Meyer-Olkin of sampling adequacy was 0.649. The Bartlett’s test of Sphericity was significant at $X^2(66, N=247) = 997.509, p<.05$.

Table 5 shows the total variance explained which represents the number of components extracted and the percentage of sum squared loading of each components with the Eigenvalue of >1. Four components were extracted with a cumulative variance of 65.6%. The first component had the highest square loading variance of 29.7% while the last component had the lowest square loading variance of 9.3%. Further, the rotation sums of squared loadings were >1 similar to Eigenvalue.
Table 5: Total Variance Explained on Innovative Technologies

<table>
<thead>
<tr>
<th>Component</th>
<th>Initial Eigens</th>
<th>Extraction Loadings</th>
<th>Rotation Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>% of Variance</td>
<td>Cumulative %</td>
</tr>
<tr>
<td>1</td>
<td>3.558</td>
<td>29.651</td>
<td>29.651</td>
</tr>
<tr>
<td>2</td>
<td>1.827</td>
<td>15.228</td>
<td>44.879</td>
</tr>
<tr>
<td>3</td>
<td>1.373</td>
<td>11.439</td>
<td>56.318</td>
</tr>
<tr>
<td>5</td>
<td>.983</td>
<td>8.189</td>
<td>73.795</td>
</tr>
<tr>
<td>6</td>
<td>.786</td>
<td>6.554</td>
<td>80.349</td>
</tr>
<tr>
<td>7</td>
<td>.706</td>
<td>5.881</td>
<td>86.230</td>
</tr>
<tr>
<td>8</td>
<td>.518</td>
<td>4.319</td>
<td>90.549</td>
</tr>
<tr>
<td>9</td>
<td>.377</td>
<td>3.141</td>
<td>93.690</td>
</tr>
<tr>
<td>10</td>
<td>.346</td>
<td>2.887</td>
<td>96.577</td>
</tr>
<tr>
<td>11</td>
<td>.235</td>
<td>1.955</td>
<td>98.533</td>
</tr>
<tr>
<td>12</td>
<td>.176</td>
<td>1.467</td>
<td>100.000</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Component Analysis.

a. Correlated components, sums of squared loadings cannot be added to obtain a total variance.

Model Summary of Innovative Strategies on Competitive Advantage

The model as summarized in Table 6 shows that all the independent variables had a significant influence on the competitive advantage of telecommunication companies in Kenya (p < .05). Product innovation (β = .133 t = 2.046, p < .05); process innovation (β = .198 t = 3.146, p < .05); technological innovation (β = .190 t = 3.089, p < .05); and market innovation (β = .120 t = 1.961, p = .05). The results show of the four independent variables, process innovation had a greater influence on competitive advantage with a beta of 0.198 followed by technological innovation with a beta of 0.190, then product innovation with a beta of 0.133 and the least was market innovation with a beta of 0.120.

Table 6: Coefficients on the Independent Variables

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>.690</td>
<td>.381</td>
<td>1.811</td>
<td>.071</td>
</tr>
<tr>
<td>Product innovation</td>
<td>.158</td>
<td>.077</td>
<td>.133</td>
<td>2.046</td>
</tr>
<tr>
<td>Process innovation</td>
<td>.260</td>
<td>.083</td>
<td>.198</td>
<td>3.146</td>
</tr>
<tr>
<td>Technological innovation</td>
<td>.194</td>
<td>.063</td>
<td>.190</td>
<td>3.089</td>
</tr>
<tr>
<td>Market innovation</td>
<td>.115</td>
<td>.059</td>
<td>.120</td>
<td>1.961</td>
</tr>
</tbody>
</table>

a. Dependent Variable: competitiveness_2
b. Predictors: (Constant), Market innovation, Technological innovation, Process innovation, Product innovation

Discussion

Product Innovation

The buyer-seller relationship is key in maintaining the competitive advantage of a telecommunications market. What this means is, the new product with better performance features will not only attract several customers, but also give the operating firm a clear competitive advantage in terms of customer numbers and market share. Locally, this can be compared to the introduction of the Mpesa product, which was a new product literally in the
whole world. Such an innovative product has continuously led to the ever-attachment of customers to the telecom, and hence providing a strong competitive advantage that is very difficult to compete with from rivals. Markovic and Bagherzadeh (2018) observe that the best way to protect such an innovative product on the competitive market is to keep making advancements, which leave the competition unable to replicate the product. The involvement of stakeholders is key but does not directly influence the product innovation. This means, there is an element of innovation protection in the market where such a product in being traded. Markovic and Bagherzadeh (2018) also contend that the only way for such a product to remain on top of the competitive ladder is to maintain proficiency and viability. In Kenya, Digifarm and Twiga Limited provide farmers with information on seedlings, tilling, harvesting, and selling of the produce in the Kenyan market through mobile applications. Other scholars including David (2019) established that the amount of resources used to maintain a product innovation would determine the sustainability of the firm to remain competitive.

**Process Innovation**

Moyano-Fuentes *et al.*, (2018) point out that firms spend as much as 30 percent of their time on upgrading their processes to make operations both internal and external by their customers much smoother than before. In essence, the scholars reckon that all that matters for a customer is to go through any process as quickly as possible without so much queuing time. The efforts in upgrading systems are not only vested in monitoring and evaluation, but that a good firm should have it at all points in the line of production. This is also a view shared by Akramet *et al.*, (2017) who observe that there is always a network of organizations that enable firms to have specific processes that are not easily replicable and hence maintain the necessary competitive advantage at every stage on the market. By so doing, firms have to maintain a strong research and development teams that can benchmark processes that edge them ahead of the competition. Akramet *et al.* (2017) add that firms that quickly adopt innovative processes will not only retain customers, but also get new ones, especially if the innovative process is creative enough. There is also the observation that innovative processes can lead to new branches opening as well as new absorption of employees who could not be inculcated on the old process system.

**Technological Innovation**

Oughton *et al.*, (2018) acknowledge that innovations surpass old technological standards and offer consumers the opportunity to enhance their capabilities in order to accomplish tasks and enhance their social status. Oughton *et al.*, (2018) also found that noteworthy effect on organization performance was from technological advancement. The organizations endeavor in creating procedures and items upgrade the execution of the firm including quantitative and subjective execution. Wasono and Furinto (2018) also found positives in the technological innovations. The scholars affirm that there is a positive relationship between item development and association execution if good leadership guides the innovations. It is also notable that technological innovations enhance the ability of the firm to link up with stronger partners in the market with the hope that a partnership on the technological front could be possible. Locally, Osano and Koine (2016) indicate in their study that technological innovations are key to the competitive advantage of a firm.

**Market Innovation**

Asimakopoulos and Whalley (2017) found that market leadership was key to acquiring stable competitive advantage. This is an opportunity for such a firm to have a stronghold of the market in terms of customer base and retained branch shares. Market innovation thus improves the position of the firm’s competitive advantage at all levels. Similarly, Lin *et al.*, (2018) support
the proposition that market innovation is a disruptive design that can ensure firms’ competitiveness. Specifically, market innovation strategies can include learning orientation as well as firm entrepreneurship while observing research and development innovation strategy. In essence, this has led to high marketing performance. As observed in other studies, a firm can have influence with their new product development and have customer responsiveness that leads to marketing effectiveness and marketing advantage (Ossadzifo, 2018).

Conclusions and Recommendations

Product Innovation
The study concludes that there is an effort to increase the number of products in the market by telecommunication companies in Kenya. However, the findings suggest that there are a limited number of products that can be produced competitively in the market. As a matter of urgency, the study recommends government sponsorship to scholars or trainees pursuing high technology. Similarly, there is a need to increase funding and research missions and government support in upcoming firms.

Process Innovation
The positive results lead to the conclusion that process innovation contributes to telecommunication companies profit making. Customers are also most likely to enjoy the processes, which help them get services. It is, therefore, fair to conclude that process innovation is a strong factor in influencing the competitive advantage of telecommunication companies in Kenya. The study thus, recommends that the Kenya government through their agent, the Communications Authority of Kenya could set up guidelines on the adoption of specific process innovations in order to avoid those innovations that could prove controversial in the market and in particular to the citizens of the land.

Technological Innovation
From the Kenyan experience, innovative technologies like touch screens and power banks have attracted large numbers of new customers who always prove loyal. In general, Kenyans like to have new innovative technologies that are reliable and functional at whatever cost. Thus, technological innovation remains a key influence on the competitive advantage of telecommunication companies in Kenya. From the foregoing conclusion, the study recommends that there is need for each firm to consider what technological innovations are worth adopting to avoid cases of expensive innovative technologies that later prove cumbersome or expensive to sustain. Specifically, the study recommends that firms should only pick on innovative technologies that provide economies of scale regardless of whether they appear cheap or otherwise.

Market Innovation
The low-end markets catering for low-income earners have used technological innovations to keep their low-end markets very active. Similarly, the high-end markets have remained vibrant following incentives that have kept these customers happy. The study observed that both markets make specific telecommunication companies remain on top of their group and hence the intensity of maintaining the markets has remained high. It is, therefore, fair to conclude that market innovation in telecommunication companies in Kenya has maintained a strong push in retaining competitive advantage most of the time. The specific recommendation for telecommunication companies is, the government should continue sponsoring students of market specialization especially in the study of technology markets to countries that are
advanced in the subject including the Tiger nations of Korea, Hong Kong, Taiwan as well as Europe and the competitive Indian sub-continent.

References


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