

Strategic Response and Competitive Advantage of Telecommunication Firms in Nairobi City County, Kenya

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Abstract

Strategic response is used to improve competitiveness in organizations. Innovation has been adopted as a strategic response to volatile business environments. However, business sustainability in highly competitive markets remains a challenge for many businesses in Kenya. This study examined strategic response and competitive advantage of telecommunication firms in Nairobi City County, Kenya. The specific objectives were to establish how process automation, product development, market development and strategic alliances influence competitive advantage of telecommunication firms in Nairobi City County, Kenya. The theories that supported this study include diffusion of innovation theory, resource-based theory, economic entrepreneurship theory and theory of the innovative firm. Descriptive research design was used with questionnaire as the instrument for data collection. Reliability of the study instrument was established using Cronbach Alpha, internal consistency method. Validity of the research instrument was determined using content, face and construct validity. Data was collected from 64 telecommunication firms in Nairobi City County. The unit of observation was strategic managers, marketing managers and information technology managers in the telecommunication firms. Data collected was analyzed using SPSS version 28 and presented in form of frequencies, descriptive and inferential statistics which will be used to derive conclusions. The study conducted a multiple regression analysis to determine the relationship between strategic response and competitive advantage of telecommunication firms. Correlation results revealed that strategic response influences competitive advantage of telecommunication firms in Nairobi City County. The results indicated that there was a positive and significant relationship between product development, market development, strategic alliances and competitive advantage. The study recommends adoption of strategic response in telecommunication firms to improve competitive advantage.

Keywords: *Strategic Response and Competitive Advantage of Telecommunication Firms in Nairobi City County, Kenya*

1.1 Background of the Study

In today's globalized and fast-evolving market, firms face continual competitive pressures, technological advancements, and unforeseen disruptions. How organizations respond strategically to these challenges plays a significant role in determining long-term success (Thi et al., 2023). Competitive advantage, defined as the ability of a firm to perform in a manner that allows it to outperform its competitors, is closely linked to how well organizations adapt and respond to environmental shifts (Abdulwase et al., 2020). Strategic response refers to the actions organizations take to adapt to internal and external environmental changes, encompassing

proactive responses that anticipate opportunities and reactive responses to immediate crises. These responses are shaped by market conditions, competition, technological developments, regulatory changes, and organizational resources (Farida & Setiawan, 2022). The Resource-Based View further emphasizes that firms possessing valuable, rare, inimitable, and non-substitutable resources maintain a sustained edge over competitors (Thomran et al., 2022).

Firms operating in dynamic environments increasingly rely on strategic responses to maintain or enhance their competitive positions. During periods of crisis and instability, organizations adopt defensive strategies including downsizing, restructuring, and diversification to protect market share, with resilience, adaptability, and risk management forming the core of effective crisis response (Eiriz & Barbosa, 2022). Technology has emerged as an increasingly critical element of business management in responding to competition and market changes. According to Terer and Gichure (2020), technology is an essential element for industry competitiveness. The telecommunication sector in Kenya has undergone tremendous transformation over the last two decades, with increased competition compelling firms to adopt new and disruptive technologies. The emergence of new market players offering innovative products and services is fundamentally challenging traditional telecommunication business models, compelling established firms to continuously innovate to remain viable (Mande & Ngonga, 2020).

Globally, strategic response has been extensively studied as a driver of competitive advantage across diverse industry contexts. Ghosh and Kotturi (2020) established that strategic innovations played a key role in enabling organizations adapt to changes in international business environments, with firms adopting product and process innovations achieving improved market positioning and higher productivity. Van Doren and Vellios (2023) confirmed that strategic response was critical in achieving competitive advantage among firms in America. Almeida, Souza, and Castellanos (2021) found that firms maintaining competitiveness in the United States and Europe regularly changed their market positioning and invested in market development. Liu, Man, and Liao (2022) further established that digital transformation as a strategic response enabled European firms to respond to technological disruptions, with artificial intelligence and automation adoption emerging as primary strategic responses to technology-driven market disruptions (Schumacher et al., 2021).

In the African regional context, strategic responses have been shaped by unique institutional challenges, market volatility, and economic instability. Kgomotso and Akinlolu (2021) established that market development through market positioning and segmentation were primary strategic responses to volatility among African firms, with those adopting strategic responses remaining most competitive. Mufudza and Chileshe (2020) found that African firms in banking and telecommunications faced regulatory changes, political instability, and weak governance structures, responding through innovation, local adaptation, and government partnerships. Ogunyemi and Mbigi (2022) established that Nigerian firms adapted through product differentiation and market positioning in response to institutional and competitive pressures. Babatunde and Ibhagui (2023) confirmed that multinational firms in Africa's telecommunication sector adopted innovative business models and technologies as strategic responses to both local and global competition.

In the Kenyan context, strategic response has been documented as essential for navigating political instability, economic uncertainty, and competitive pressures from local and multinational players. Munyua and Kagwe (2022) found that Kenyan firms adopting innovative strategies such as market

positioning and market development navigated volatility and achieved competitiveness. Gathara and Mureithi (2021) established that Kenyan firms used cost leadership, innovation, and market positioning as competitive strategies against fierce local and multinational competition. Ochieng and Aduda (2021) found that innovation served as the primary strategic response enabling Kenyan telecommunication firms to differentiate themselves and maintain a competitive edge in a highly dynamic sector. Kenya's telecommunication industry contributes significantly to the national economy through GDP growth, employment creation, and tax revenue expansion, underscoring the critical importance of effective strategic response (King'ori et al., 2017).

Kenya's telecommunication sector is predominantly mobile-based, with mobile penetration exceeding 90% and significant growth in mobile data usage and mobile money adoption. Safaricom dominates the market with over 60% market share through voice, data, and M-Pesa mobile money services. Airtel Kenya serves as the primary competitor, while Telkom Kenya focuses on both mobile and fixed-line services. M-Pesa, launched by Safaricom in 2007, has positioned Kenya as a global leader in mobile money, significantly improving financial inclusion in rural areas. Internet penetration has exceeded 40% of the population, with mobile internet representing the dominant form of access. Fiber optic networks are expanding rapidly in urban areas, with Safaricom, Zuku, and Liquid Telecom investing heavily in broadband infrastructure, while 5G trials signal the next generation of connectivity development (Communications Authority of Kenya, 2023).

The regulatory environment governing Kenya's telecommunication sector is administered primarily by the Communications Authority of Kenya, which oversees licensing, regulation, and compliance with industry standards. Government policies aim at encouraging competition, improving coverage in underserved areas, and ensuring consumer protection. The Data Protection Act and Telecommunications Service Providers' Code of Practice serve as critical frameworks ensuring data privacy and secure mobile services. The convergence of telecommunications with financial technology creates significant growth opportunities, as mobile money platforms expand into savings, loans, insurance, and investment services. However, competition in the sector remains fierce due to high innovation rates, rapid technology advancement, and the entry of disruptive global players. Firms in the sector are increasingly compelled to adopt innovative strategies and advanced technology to maintain their market positions (Makanga & Paul, 2017).

Despite the sector's impressive growth trajectory, telecommunication firms in Kenya continue to face significant challenges in sustaining competitive advantage in an increasingly contested market. According to CAK (2021), mobile subscriptions grew by 3.0% to reach 44.119 million subscribers, yet performance disparities between large and small firms remain pronounced, with only dominant players such as Safaricom demonstrating sustained profitability (Ngugi & Murugi, 2022). Smaller firms struggle to adopt effective strategic responses, with strategic innovations largely remaining the preserve of large firms controlling significant market share. Chang et al. (2020) noted the importance of building business synergies between telecommunication firms and other industry players to optimize innovation. This study therefore examined strategic response through process automation, product development, market development, and strategic alliances as determinants of competitive advantage of telecommunication firms in Nairobi City County, Kenya.

1.2 Statement of the Problem

The increased competition in the telecommunication sector has led to the introduction of new products and services in the market. In order to survive and grow in the market, telecommunication firms have been forced to adopt new technology and innovative products. According to Internet World Stats (2022), internet connections are accessible to 54.4% of the population in the world today. In addition, from 0.4 Billion in 2020 to 3.4 Billion in 2022, the count of users of the internet has risen dramatically. The percentage of people who use a smart phone for internet increased from 33% and 44% in 2012 to 79% and 72% in 2016 respectively. However, according to Ngugi and Murugi (2022), performances in the telecommunication sector is very minimal and only large companies such as Safaricom seem to have monopoly which is an indication of challenges in competitiveness of firms in the industry. According to CAK(2021), mobile penetration rose by 3.0 per cent to hit 44.119million subscribers between January and March 2019. This is compared to 42.815 million subscription during the previous quarter, hence registering a 3.0 percent growth. However, despite these rapid developments in the mobile market, improved international connectivity, and increased competition, firms in the telecommunication sector in Kenya continues to face challenges in sustaining their performance in the highly competitive industry.

According to CAK report 2020, innovative solutions in telecommunication such as adoption of disruptive technologies have led to increased competition among telecommunication firms. Telecommunication firms face challenges in adopting effective strategic response to remain competitive. There is high disparities between top industry players and smaller firms in adopting strategic solutions. Strategic response among telecommunication firms is limited to large firms which control large market share limiting the growth potential of small and medium firms. Chang et al. (2020) analyzed how Indonesian firms changed business processes and found that in order to optimize the role of innovation, it is necessary to build business synergies between telecommunication firms and other industry players. Huebner et al. (2021), research on impacts of technology on firm performance, found that innovation strategies cut out financial intermediaries hence cutting cost. In Kenya, research work on competitive advantage in the telecommunication sector do not assess the strategic response which present conceptual gaps. There are a lot of studies done on innovation and competitive advantage but in developed countries which presents contextual gaps. This study sought to fill these gaps by examining strategic response and competitive advantage of telecommunication firms in Nairobi City County, Kenya.

1.3 Objective of the Study

- i. To establish the influence of process automation on competitive advantage of telecommunication firms in Nairobi City County, Kenya.
- ii. To determine the influence of product development on competitive advantage of telecommunication firms in Nairobi City County, Kenya.
- iii. To find out the influence of market development on competitive advantage of telecommunication firms in Nairobi City County, Kenya.
- iv. To assess the influence of strategic alliances on competitive advantage of telecommunication firms in Nairobi City County, Kenya.

2.0 Literature Review

This chapter reviews the existing literature on the variables under study, which include process automation, product development, market development and strategic alliances in relation to

competitive advantage of telecommunication firms in Nairobi City County, Kenya. It presents an analysis of theories that support the study, a conceptual framework and empirical review.

2.1 Theoretical Framework

A theory explains phenomena or are supported by evidence meant to explain some phenomena. Theories provide a generalized explanation to an occurrence of phenomena (Kombo & Tromp, 2019). The theoretical review will help the researcher clearly to see the independent and dependent variables of this study. The theories reviewed and which inform this study are diffusion of innovation theory, resource-based theory, economic entrepreneurship theory and theory of the innovative firm.

2.1.1 Diffusion of Innovation Theory

Rogers (1962) developed the diffusion of innovation theory to explain how, why, and at what rate new ideas and technology spread. According to Rogers (2003), diffusion is the process by which an innovation is communicated over time among the participants in a social system. He proposes four main elements influence the spread of a new idea: the innovation, communication channels, time and a social system. The innovation must be widely adopted in order to self-sustain. Rogers (2003) lists the categories of adopters as innovators, early adopters, early majority, late majority, and laggards. Adoption of a new idea does not happen simultaneously rather it is a process whereby some people are more apt to adopt the innovation than others are. According to Wayne (2016), the result of this diffusion is that people, as part of a social system adopt a new idea, behaviours, or product. Adoption means that a person does something differently than what they had previously. The theory is applicable to this study as it demonstrates the link between process automation and organizations' competitiveness. Increased innovation in an organization through process automation is expected to enhance competitiveness.

2.1.2 Resource-based Theory

Resource-based theory by Barney (1991) states that the possession of resources is valuable. The resource-based theory suggests that organizations should look inside the company to find the sources of competitive advantage through the use of their resources. Competitive advantage is an advantage that a firm has over its competitors that allow it to generate sales or margins and/or retains more customers than the competition (Cole, 2017). A firm's competitive advantage evolves from the resources that the organization has. In the resource-based theory model, resources are given the major role of assisting companies in achieving higher organizational performance and competitive advantage. Resource-based theory prescribes that organizations position themselves strategically based on their resources and capabilities rather than their products and services (Barney, 1991). Within resource-based theory, the key terms include tangible resources, intangible resources, and capabilities. Tangible resources are resources that can be seen, touched, and quantified such as company's property, factory, equipment, and even cash. These physical resources give you advantage since you must have these types of resources in order to achieve the company's goals. Intangible resources are resources that are difficult to see, touch, or quantify, such as the knowledge and skills of employees, a firm's reputation, and a firm's culture. Executives who wish to achieve long-term competitive advantages should therefore place a premium on trying to nurture and develop their firms' resources (Cole, 2017). Firms can use available resources to transform organizational processes, procedures and operations to achieve better performance. A company which possesses valuable resources such as information systems, finances, production

infrastructure and capability is able to innovate to adapt to changes in the business environment. This theory provides a deep understanding on the role of resources in product development to achieve growth. The theory supports product development variable under study.

2.1.3 Economic Entrepreneurship Theory

Economic entrepreneurship theories were introduced by Richard Cantillon in the first half of the 1700s, who brought the idea of entrepreneurs as risk takers. The economic entrepreneurship theory has deep roots in the classical, neoclassical theories of economics, and the Austrian market process (AMP). The Austrian Market process (AMP) model which will be adopted in this study was influenced by Joseph Alois Schumpeter (1934). Schumpeter (1934) described entrepreneurship as a driver of market-based systems. An important function of an enterprise according to this model was to create something new which resulted in processes that served as impulses for the motion of market economy. Fiet (2002) held that entrepreneurs are incentivized to use episodic knowledge (that is, possibly never seen before and never to be seen again), to generate value.

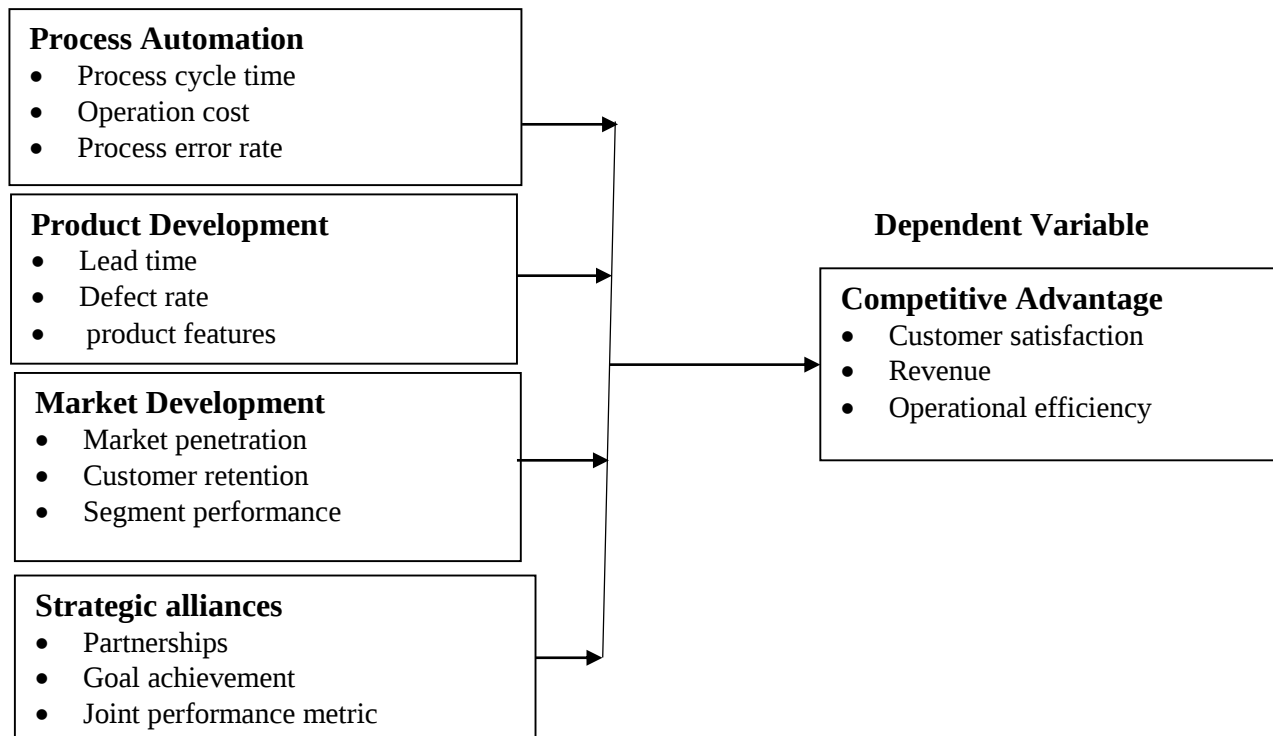
Casson (2005) contends that an entrepreneur is the prime mover in economic development, and one's function is to innovate, or to carry out new combinations. In the current study, as suggested in the economic entrepreneurship theory by, the performance of firms is largely influenced by such factors as innovation and risk-taking. The economic theory of entrepreneurship firmly states that the economy and entrepreneurial activity are intertwined, with entrepreneurs needing prosperous conditions to be able to thrive. Economic factors play an important role in the development of entrepreneurial activities. This concept asserts that entrepreneurs are motivated by economic incentives such as technological market knowledge and associated resources. Availability of markets can drive entrepreneurial growth. The absence of markets for products can also drive entrepreneurial activity through development of new markets and improvement of existing markets through innovation. Adoption of new ideas such as distribution channel innovations leads to improvements in products, processes and services. The model demonstrates the link between market development and competitiveness of firms. Market development is expected to improve competitive advantage of firms.

2.1.4 Theory of the Innovative Firm

The theory of the Innovative Firm by Joseph Schumpeter in 1984 posit that organization benefits if their innovation is successful either in reducing the overall cost of production or increasing the demand for their product (Sledzik, 2013). According to the theory of the innovative firm the function of a firm is to transform productive resources into goods and services that can be commercialized. Innovative firms have the ability to transforms productive resources into higher quality, lower cost goods and services translating to a gain for the customers and other participants in the economy (Lazonick, 1994). According to the theory, firms can gain and sustain its competitiveness to compete effectively in its industry through innovation. Innovative firms can compete, through innovation as opposed to varying price and quantity. Innovative firms become competitive by investing in quality and quantity productive resources. The theory is relevant to the study since innovative firm are able to use strategic alliances to develop new and existing products, processes, systems to meet consumer needs and increase their market share. The theory supports strategic alliances variable under study.

2.2 Conceptual Framework

Conceptual framework is the graphical representation of variables, which are the dependent variable and the independent variables. The framework shows the dependent and independent variables utilized in a study. Hrebiniak (2021), defines it as a group of concepts, which are organized in a systematic manner to provide a tool for integrating and interpreting information. The conceptual framework provides a foundation for development of the variables under study.



Independent Variables

Figure 1: Conceptual Framework

2.3 Empirical Review

Uddin and Akhter (2021) assessed telecommunication and technology in penetrating foreign markets among United States firms and found that marketing alliances, process automation, and innovation strategies made market penetration easier through increased benefits in distribution and marketing, with innovative strategies reducing costs of market entry by expanding firms' international market capabilities. The study recommended adoption of process automation and innovative strategies to access new markets and increase operational scope. Karanja and Omondi (2024) examined competitiveness of firms in Kenya and found that organizational restructuring and innovation through process automation had a significant effect on performance of businesses operating in competitive environments. The study established that response strategies were critical for businesses navigating dynamic markets and recommended adoption of process automation as an innovation strategy for achieving competitive advantage in Kenya's increasingly competitive business landscape.

Zhang and Liang (2023) examined strategic choices and competitive advantage of firms in China and found that product differentiation through quality improvement and expanded market offerings significantly improved productivity and sustained competitiveness. Eiriz and Barbosa (2022) established in Portugal that differentiation had a positive and significant effect on firm performance, with product development through differentiation leading to increased productivity and higher market share. Mustafa and Latkovikj (2020) found that among generic competitive strategies, differentiation had the highest effect on firm performance and market share improvement in competitive environments. Njoroge and Kaluyu (2020) conducted a study on competitive advantage of firms in Kenya and found that business development strategies, particularly introduction of new and improved products, had a positive and significant effect on competitiveness, with firms that innovated their product portfolios attaining higher market share and productivity levels.

Abdulwase et al. (2020) studied business strategy and competitive advantage of firms in China and found that market development had a positive and significant effect on competitive advantage, recommending its utilization as a core business strategy. Alao et al. (2020) conducted a cross-sectional study on strategic marketing and competitive advantage of firms in Nigeria and found that strategic marketing had a positive and significant effect on competitive advantage, recommending organizational commitment to strategic marketing adoption. Muiruri and Njuguna (2023) examined response strategies and competitive advantage of firms in South Sudan and found that market development and innovation had positive and significant effects on competitive advantage, concluding that management should prioritize increased utilization of market development strategies to achieve sustainable competitive advantage. Collectively, these studies confirm that market development is a consistently significant predictor of competitive advantage across diverse geographic and industry contexts.

Thi et al. (2023) conducted a study on the effect of innovation on firm performance in Vietnam and found that strategy innovation, system innovation, and process innovation had positive and significant effects on sustainable competitive advantage, recommending adoption of innovation strategies and partnerships. McCall (2024) assessed strategic response and long-term organizational success and found that strategic response had a positive and significant effect on competitive advantage, with integration of technological innovation and disruptive technology adoption positively influencing firm performance and competitiveness. Agazu and Kero (2024) conducted a study on innovation strategy and competitiveness of firms in Ethiopia and found that firms adopting innovative strategies responded effectively to competitive pressures, survived fierce competition, and achieved higher productivity. The study recommended that firms should adopt innovative strategies and strategic alliances to achieve competitive advantage in highly volatile and dynamic market environments.

Farida and Setiawan (2022) established in Indonesia that business strategies including innovation, product development, and market development had a positive and significant effect on organizational competitive advantage. Thomran et al. (2022) found in Qatar that there was a positive and significant relationship between innovativeness and competitive advantage, with firms adopting innovative strategies demonstrating markedly improved adaptability in volatile markets. Onamusi (2020) found in Nigeria that strategic response capability had a positive and significant effect on competitiveness, concluding that developing strategic response capabilities through resource investment was critical for achieving competitive advantage. Ardley and Naikar (2021) established in the United Kingdom that utilization of innovative strategies, particularly

market development, contributed positively and significantly to competitive advantage. Collectively, these studies confirm that strategic response across multiple dimensions consistently and significantly drives competitive advantage across diverse national and sector contexts.

3.1 Research Methodology

This study adopted a descriptive research design, which Render et al. (2012) define as providing an accurate description of elements under study without variable manipulation. The target population comprised 64 telecommunication firms operating in Nairobi City County as registered by the Communications Authority of Kenya (2023), with the unit of observation being one strategic manager, one marketing manager, and one information technology manager from each firm, yielding a sampling frame of 192 respondents. Since the target population was below 200, a census approach was adopted to collect data from all 192 subjects, eliminating sampling bias as recommended by Bernard (2011) and Seltman (2014). Structured questionnaires were used as the primary data collection instrument, with secondary data drawn from reports, publications, government census records, and scholarly journals. A pilot study involving 19 respondents representing 10% of the sample was conducted to assess instrument reliability and validity before the main study.

Reliability of the research instrument was measured using Cronbach's Alpha internal consistency method, with a coefficient of 0.7 and above considered acceptable (Seltman, 2014). Validity was assessed through content validity, which measured whether the instrument provided adequate coverage of the study topic through comparison with instruments from prior studies and expert review. Construct validity was tested using Confirmatory Factor Analysis, with factor loadings of 0.4 and above accepted as the minimum validity threshold. Pilot study respondents were excluded from the final study to prevent response bias. Collected quantitative data was analyzed using SPSS version 28, generating descriptive statistics including means, frequencies, percentages, and standard deviations. Inferential statistics encompassing Pearson correlation and multiple regression analysis were computed to determine relationships between variables.

4.0 Research Findings and Discussion

This section presents the findings of the study, data analysis, data presentation, and data interpretation. The study sought to establish whether process automation, product development, market development and strategic alliances affect competitive advantage of telecommunication firms.

4.1 Response Rate

The study sought to determine the response rate of the study. The total number of questionnaire forms that were administered was 173. A total of 129 forms were filled. This represented an overall successful response rate of 75% as shown in Figure 2. According to Render et al (2012), a response rate of 50% or more is adequate for a descriptive study. Therefore, a response rate of 75% was good for the study.

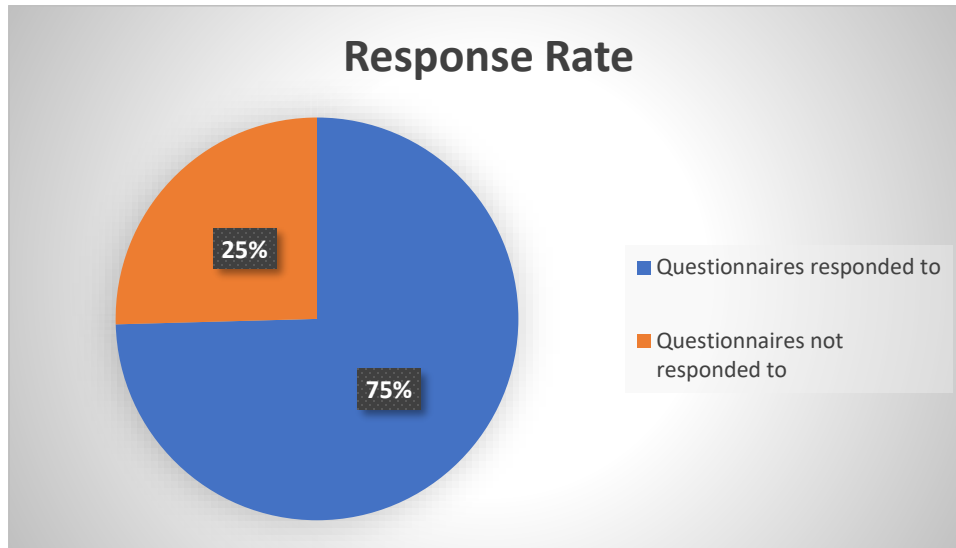


Figure 2: Response Rate

The results of the study revealed that 11% of the respondents had over 10 years' experience working with the organizations, majority (49%) had experience of between 2 and 5 years, 28% between 6-10 years and 12% had experience of less than 2 years. The results of the study indicate that most of the respondents had experience of over 5 years and therefore they had a great understanding of the telecommunications sector. The findings agree with Strong (2020) that factors such as skills and knowledge affect the employee understanding of processes and systems, in this case, years of experience in the telecommunication organizations equip employees with skills and knowledge on the sector.

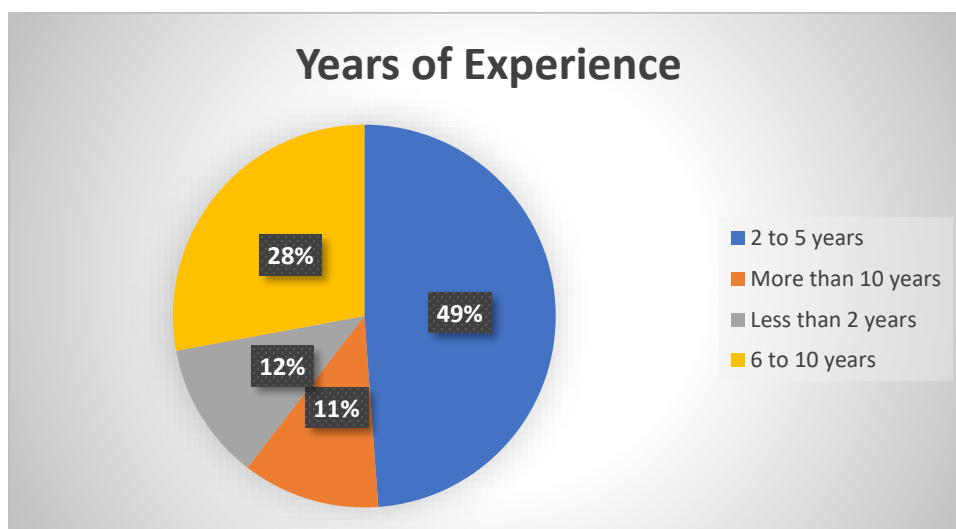


Figure 3: Years of Experience

4.2 Pilot Study Results

A pilot study was conducted on 19 respondents representing 10% of the sample population to detect weaknesses in questionnaire design and instrumentation before the main data collection exercise. Reliability was assessed using Cronbach's Alpha internal consistency method, with a

threshold of 0.7 and above considered acceptable (Seltman, 2014). All five study variables recorded Cronbach's Alpha values above this threshold, confirming the research instrument's internal consistency and suitability for the main study. Market development recorded the highest alpha of 0.871, while product development recorded the minimum acceptable value of 0.742. Process automation, strategic alliances, and competitive advantage recorded alphas of 0.821, 0.769, and 0.796 respectively. These results confirmed that the questionnaire consistently measured the intended constructs across all variables and was therefore reliable for data collection across all 64 telecommunication firms in Nairobi City County.

Further analysis of individual item reliability for process automation confirmed that all seven items met the reliability threshold, with alpha values ranging from 0.711 for machine learning implementation to 0.889 for robotic process automation, and 0.865 for process automation improving organizational competitiveness. For product development, all seven items similarly exceeded the 0.7 threshold, with alpha values ranging from 0.726 for product development improving organizational competitiveness to 0.871 for improved processes leading to improved products. The consistent reliability across all process automation and product development items confirmed that both variable scales were internally coherent and that all items were measuring the same underlying constructs without ambiguity, redundancy, or misalignment that would have necessitated item removal or revision before the main study.

Individual item reliability for market development revealed that all seven items exceeded the 0.7 threshold, with alpha values ranging from 0.752 for customer segmentation to 0.874 for advertising on online platforms, and 0.861 for market development improving competitive advantage. Strategic alliance items similarly demonstrated strong internal consistency, with alpha values ranging from 0.723 for partnerships for innovation and process optimization to 0.855 for increased production innovations through strategic alliances. These results confirmed that market development and strategic alliance scales were both internally consistent and reliable for capturing respondents' perceptions accurately. All items across both variables were therefore retained for the main study, with no items eliminated due to poor internal consistency or insufficient alpha values falling below the acceptable threshold.

Validity of the research instrument was assessed through content validity, face validity, and construct validity. Content validity was established by comparing the study instrument with those used in prior studies and through expert review by strategic management lecturers who assessed question relevance and adequacy of coverage of the study topic. Face validity was assessed by seeking feedback from strategic management lecturers on whether the questionnaire items appropriately and accurately measured strategic response and competitive advantage of telecommunication firms. Instrument improvements were made based on expert feedback received across both content and face validity assessments, ensuring that all items were clear, relevant, accurate, and adequately representative of the study variables before the main data collection exercise commenced.

Construct validity was assessed using Confirmatory Factor Analysis, with factor loadings of 0.4 and above accepted as the minimum threshold as recommended by Rahn (2014). All seven items measuring process automation recorded factor loadings ranging from 0.609 to 0.804, while product development items ranged from 0.721 to 0.861. Market development items ranged from 0.714 to 0.865, and strategic alliance items ranged from 0.701 to 0.889. Competitive advantage items ranged from 0.610 to 0.854. All 35 items across the five study variables recorded factor loadings

well above the 0.4 minimum threshold, confirming that every item converged satisfactorily onto its respective construct. The construct validity of the entire research instrument was therefore established, confirming that the measurement instrument accurately and validly represented all study variables as required for credible inferential statistical analysis.

4.3 Descriptive Findings and Analysis

This part provides the results of the descriptive analysis carried out by the study consisting percentages, mean and standard deviation. The findings were presented as per each objective.

4.3.1 Process Automation

The first objective was to establish the influence of process automation on competitive advantage of telecommunication firms in Nairobi City County, Kenya. The respondents were asked to indicate the extent to which they agree with the statement on process automation based on a Likert scale where Strongly agree -5, Agree -4, Moderate -3, Disagree -2, Strongly disagree -1. The results of the study were as shown in table 1. From the results, the respondents agreed that the organization has implemented process automation systems. This is supported by a mean of 4.27 (std. dv = 0.827). In addition, as shown by a mean of 3.61 (std. dv = 1.092), the respondents agreed that the organization uses artificial intelligence tools. Further, the respondents agreed that the organization uses robotic process automation. This is shown by a mean of 3.16 (std. dv = 1.221). The respondents also agreed that the organization has implemented machine learning. This is shown by a mean of 3.78 (std. dv = 0.946). With a mean of 3.68 (std. dv = 1.046), the respondents agreed that The organization had adopted frontend automation. The respondents agreed that the organization has adopted backend automation. This is supported by a mean of 3.92 (std. dv = 1.013). In addition, as shown by a mean of 4.40 (std. dv = 0.702), the respondents agreed that process automation has improved organizational competitiveness. Majority of the respondents agreed with the statements on process automation as shown by a mean of 3.83. The responses given by the respondents had little variation (standard deviation=0.978).

Table 1: Process Automation

	Mean	Std. Deviation
The organization has implemented process automation systems	4.27	.827
The organization uses artificial intelligence tools	3.61	1.092
The organization uses robotic process automation	3.16	1.221
The organization has implemented machine learning	3.78	.946
The organization had adopted frontend automation	3.68	1.046
The organization has adopted backend automation	3.92	1.013
Process automation has improved organizational competitiveness	4.40	.702
Aggregate	3.83	.978

4.3.2 Product Development

The second objective was to determine the influence of product development on competitive advantage of telecommunication firms in Nairobi City County, Kenya. The results of the study were as shown in table 2. From the results, the respondents agreed that organizational processes

have improved. This is supported by a mean of 4.43 (std. dv = 0. 758). In addition, as shown by a mean of 4.26 (std. dv = 0. 734), the respondents agreed that improved processes have led to improved products. Further, the respondents agreed that the organization has introduced new products. This is shown by a mean of 4.31 (std. dv = 0. 855). With a mean of 4.12 (std. dv = 0. 949), the respondents agreed that organizational products are innovative. The respondents agreed that the organization uses advanced technology in product development. This is supported by a mean of 4.14 (std. dv = 0. 882). In addition, as shown by a mean of 4.34 (std. dv = 0. 755), the respondents agreed that use of modern operations systems have improved product quality. Further, the respondents agreed that product development has improved organizational competitiveness. This is shown by a mean of 4.55 (std. dv = 0. 572). Majority of the respondents agreed with the statements on product development as shown by a mean of 4.31. The responses given by the respondents had little variation (standard deviation=0.787).

Table 2: Product Development

	Mean	Std. Deviation
Organizational processes have improved	4.43	.758
Improved processes have led to improved products	4.26	.734
The organization has introduced new products	4.31	.855
Organizational products are innovative	4.12	.949
The organization uses advanced technology in product development	4.14	.882
Use of modern operations systems have improved product quality	4.34	.755
Product development has improved organizational competitiveness	4.55	.572
Aggregate	4.31	.787

4.3.3 Market Development

The third objective was to find out the influence of market development on competitive advantage of telecommunication firms in Nairobi City County, Kenya. The results of the study were as shown in table 3. From the results, the respondents agreed that the organization partners with other market players. This is supported by a mean of 4.33 (std. dv = 0. 782). In addition, as shown by a mean of 4.19 (std. dv = 0. 858), the respondents agreed that The organization has well established markets for its products. Further, the respondents agreed that the organization has increased its market share. This is shown by a mean of 4.40 (std. dv = 0. 754). The respondents also agreed that the organization uses customer segmentation to sell products. This is shown by a mean of 4.40 (std. dv = 0. 754). With a mean of 4.44 (std. dv = 0. 636), the respondents agreed that the organization has adequate information sharing platforms. The respondents agreed that advertising on online platforms has increased sales. This is shown by a mean of 4.43 (std. dv = 0. 768). The respondents also agreed that market development has improved competitive advantage. This is shown by a mean of 4.59 (std. dv = 0. 581). Majority of the respondents agreed with the statements on market development as shown by a mean of 4.40. The responses given by the respondents had little variation (standard deviation=0.733).

Table 3: Market Development

	Mean	Std. Deviation
The organization partners with other market players	4.33	.782
The organization has well established markets for its products	4.19	.858
The organization has increased its market share	4.40	.754
The organization uses customer segmentation to sell products	4.40	.754
The organization has adequate information sharing platforms	4.44	.636
Advertising on online platforms has increased sales	4.43	.768
Market development has improved competitive advantage	4.59	.581
Aggregate	4.40	.733

4.3.4 Strategic Alliances

The fourth objective was to assess the influence of strategic alliances on competitive advantage of telecommunication firms in Nairobi City County, Kenya. The results of the study were as shown in table 4. From the results, the respondents agreed that the organization has adopted partnerships for innovation. This is supported by a mean of 4.28 (std. dv = 0. 875). In addition, as shown by a mean of 4.19 (std. dv = 0.911), the respondents agreed that the organization has embraced new alliances to improve its operations. Further, the respondents agreed that the organization has partnered with other firms to adopt advanced technology. This is shown by a mean of 4.22 (std. dv = 0. 912). The respondents also agreed that the organization has increased production innovations through strategic alliances. This is shown by a mean of 4.22 (std. dv = 0. 721). With a mean of 4.26 (std. dv = 0.832), the respondents agreed that the organization has well-established relationships with partners in the industry. The respondents also agreed that the organization has incorporated process optimization. This is shown by a mean of 4.22 (std. dv = 0.721). The respondents also agreed that strategic alliances have improved organizational competitive advantage. This is shown by a mean of 4.23 (std. dv = 0.825). Majority of the respondents agreed with the statements on strategic alliances as shown by a mean of 4.23. The responses given by the respondents had little variation (standard deviation=0.828).

Table 4: Strategic Alliances

	Mean	Std. Deviation
The organization has adopted partnerships for innovation	4.28	.875
The organization has embraced new alliances to improve its operations	4.19	.911
The organization has partnered with other firms to adopt advanced technology	4.22	.912
The organization has increased production innovations through strategic alliances	4.22	.721
The organization has well-established relationships with partners in the industry	4.26	.832
The organization has incorporated process optimization	4.22	.721
Strategic alliances have improved organizational competitive advantage	4.23	.825
Aggregate	4.23	.828

4.3.5 Competitive Advantage of Telecommunication Firms

The study sought to establish the competitive advantage of telecommunication firms in Nairobi City County, Kenya. The results of the study were as shown in table 5. From the results, the respondents agreed that innovation strategies have increased organizational market share. This is supported by a mean of 4.40 (std. dv = 0.754). In addition, as shown by a mean of 4.64 (std. dv = 0.481), the respondents agreed that strategic response has led to improved customer satisfaction. Further, the respondents agreed that strategic response has led to operational efficiency. This is shown by a mean of 4.43 (std. dv = 0.705). Majority of the respondents agreed with the statements on competitive advantage as shown by a mean of 4.49. The responses given by the respondents had little variation (standard deviation=0.647).

Table 5: Competitive Advantage of Telecommunication Firms

	Mean	Std. Deviation
Innovation strategies have increased organizational market share	4.40	.754
Strategic response has led to improved customer satisfaction	4.64	.481
Strategic response has led to operational efficiency	4.43	.705
Aggregate	4.49	.647

Further, the respondents were asked to indicate the extent to which they thought process automation, product development, market development, strategic alliances, influenced competitive advantage of telecommunication firms. The results as shown in table 6 showed that respondents agreed that process automation influenced competitive advantage of telecommunication firms to a

great extent (Mean=4.32). The results also revealed that respondents agreed that product development influenced competitive advantage of telecommunication firms to a great extent (Mean=4.35). Moreover, results indicated that respondents agreed that market development influenced competitive advantage of telecommunication firms to a great extent (Mean=4.19). Further, results showed that respondents agreed that strategic alliances influenced competitive advantage of telecommunication firms to a great extent (Mean=4.30). The results agree with findings by McCall (2024) study, which found that strategic response has a positive and significant effect on competitive advantage of organizations.

Table 6: Competitive Advantage

	Mean	Std. Deviation
To what extent has process automation influenced competitive advantage of telecommunication firms?	4.32	.673
To what extent has product development influenced competitive advantage of telecommunication firms?	4.35	.692
To what extent has market development influenced competitive advantage of telecommunication firms?	4.19	.846
To what extent has strategic alliances influenced competitive advantage of telecommunication firms?	4.30	.680
Aggregate	4.29	.723

4.4 Inferential Analysis Results

The scores computed for this part of analysis were used to determine the relationship between the independent variables and the dependent variable and the level of influence that the independent variables have on the dependent variable. This was achieved by Pearson Moment correlation as well as fitting a linear multivariate regression model for the data.

4.4.1 Correlation Results

The study carried out correlation tests to determine the relationship between the independent and dependent variables. Pearson correlation, which ranges between -1 and +1 was used because the data was discreet. A positive Pearson correlation value indicates a positive relationship while any negative Pearson correlation value indicates a negative relationship. The association between the variables becomes stronger as the Pearson correlation value approaches either +1 or -1. The results of the correlation analysis are shown in table 7. Person correlation coefficient for process automation is 0.686 and a significance value ($0.000 < 0.05$), indicating that there is a strong and positive association between process automation and competitive advantage of telecommunication firms in Nairobi City County. The findings are consistent with findings by Uddin and Akhter (2021) study which found that process automation and innovation strategies made market penetration easier through increased benefits in distribution and marketing.

Person correlation coefficient for product development is 0.795 and a significance value of ($0.000 < 0.05$), indicating that there is a strong and positive association between product

development and competitive advantage of telecommunication firms in Nairobi City County. The findings agree with findings by Zhang and Liang (2023) study which established that that product differentiation had a positive and significant impact on competitiveness of firms. Person correlation coefficient for market development is 0.857 and a significance value of ($0.000 < 0.05$), indicating that there is a strong and positive association between market development and competitive advantage of telecommunication firms in Nairobi City County. The findings agree with findings by Abdulwase et al. (2020) study which concluded that market development had a positive and significant effect on competitive advantage of firms.

Person correlation coefficient for strategic alliances is 0.847 and a significance value of ($0.000 < 0.05$), indicating that there is a strong and positive association between strategic alliances and competitive advantage of telecommunication firms in Nairobi City County. The findings are consistent with findings by Thi et al. (2023) which found that innovation strategies had positive and significant effect on sustainable competitive advantage of firms. The study found that adoption of innovation strategies and partnerships improved competitive advantage.

Table 7: Correlation Analysis

		Process automation	Product development	Market developm ent	Strategic alliances	Competitive advantage
Process automation	Pearson Correlation Sig. (2-tailed)	1.000				
Product development	Pearson Correlation Sig. (2-tailed)	.640**	1.000			
Market development	Pearson Correlation Sig. (2-tailed)	.600**	.693**	1.000		
Strategic alliances	Pearson Correlation Sig. (2-tailed)	.698**	.700**	.813**	1.000	
Competitive advantage	Pearson Correlation Sig. (2-tailed)	.686**	.795**	.857**	.847**	1.000

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

4.4.2 Regression Results

The multiple linear regression analysis was carried out to determine the relationship between strategic response and competitive advantage of telecommunication firms in Nairobi City County, Kenya. Multiple regression analysis helped to find out the best predictor variable or the strength of relationship of each independent variable (process automation, product development, market development, strategic alliances) on the dependent variable thus resulting into an optimal model. The results from the regression model were used to establish the coefficient of determination analysis, model fitness analysis and model coefficients.

4.4.2.1 Model Summary

The model summary was used to test the amount of variation in the dependent variable (competitive advantage of telecommunication firms in Nairobi City County, Kenya) resulting from the changes in the independent variables (constructs of strategic response). Thus, the amount of variation on competitive advantage of telecommunication firms in Nairobi City County, Kenya resulting from process automation, product development, market development, strategic alliances was determined, as detailed in table 8. The R-Squared value of 0.846 indicates that approximately 84.6% of the variation in the competitive advantage of telecommunication firms in Nairobi City County is explained by the combined effect of process automation, product development, market development and strategic alliances. The remaining 15.4% is explained by other factors not part of this model. The regression results show that R was 0.920 which shows that the correlation between the independent variables and the dependent variable is positive. The adjusted R-square of 0.841 indicates that model retains its predictive power even when the number of predictors and sample size are adjusted. Thus, the model incorporating process automation, product development, market development and strategic alliances provides a reasonably good fit for predicting the competitive advantage of telecommunication firms in Nairobi City County.

Table 8: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.920 ^a	.846	.841	1.47051

a. Predictors: (Constant), Strategic alliances, Process automation, Product development, Market development

4.4.2.2 Analysis of Variance

Analysis of variance was to assess the significance of the model in predicting the influence of strategic response at 95% confidence interval. The aspect of strategic response included in the model were process automation, product development, market development, strategic alliances. The results were presented as shown in table 9. The results confirmed that the model incorporating the four aspects of strategic response exhibits the desired level of statistical significance to explain the variation in the competitive advantage of telecommunication firms in Nairobi City County ($F = 170.672$; $p = 0.00$; $p < 0.05$). Therefore, the model is statistically significant in explaining the influence of strategic response on the competitive advantage of telecommunication firms in Nairobi City County.

Table 9: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1476.249	4	369.062	170.672	.000 ^b
	Residual	268.139	124	2.162		
	Total	1744.388	128			

a. Dependent Variable: Competitive advantage

b. Predictors: (Constant), Strategic alliances, Process automation, Product development, Market development

4.4.2.3 Coefficients

The role of the coefficients in this study was to unveil the effect of each independent variable on the dependent variable in terms of magnitude, direction, and significance. The computed results are presented in table 10. The constant value of the model is 4.870. The value indicates that without considering strategic response, the competitive advantage of telecommunication firms in Nairobi City County, which is accounted for by other factors, is positive. The coefficient of process automation is 0.062 ($p = 0.138$; $p > 0.05$), suggesting that process automation has a positive relationship with competitive advantage of telecommunication firms in Nairobi City County. However, the relationship is not significant. The result implies that implementing process automation is likely to have a small positive influence on telecommunication firms in Nairobi City County. The results do not agree with findings by Karanja and Omondi (2024) study which established that organizational restructuring and innovation through process automation had significant effect on performance of businesses in competitive environments.

The coefficient of product development is .234 ($p = 0.00$; $p < 0.05$), suggesting that product development has a positive and significant relationship with competitive advantage of telecommunication firms in Nairobi City County. The result implies that increasing product development is likely to have a positive influence on competitive advantage of telecommunication firms in Nairobi City County. Product development through differentiation led to increased productivity and higher market share. The coefficient of market development is 0.353 ($p = 0.00$; $p < 0.05$), suggesting that market development has a positive and significant relationship with competitive advantage of telecommunication firms in Nairobi City County. The result implies that increased market development is likely to have a positive influence on competitive advantage of telecommunication firms in Nairobi City County. The coefficient of strategic alliances is 0.335 ($p = 0.00$; $p < 0.05$), suggesting that strategic alliances has a positive and significant relationship with competitive advantage of telecommunication firms in Nairobi City County. The result implies that utilization of strategic alliances is likely to have a positive influence on competitive advantage of telecommunication firms in Nairobi City County. The findings are consistent with findings by Agazu and Kero (2024) study which found that firms that adopted strategic alliances responded effectively to changes in the business environment, survived fierce competition and achieved higher productivity.

Table 10: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	4.870	1.068		4.558	.000
Process automation	.062	.041	.077	1.494	.138
Product development	.234	.045	.280	5.204	.000
Market development	.353	.058	.385	6.086	.000
Strategic alliances	.208	.050	.284	4.119	.000

a. Dependent Variable: Competitive advantage

Optimal Regression Model

Competitive advantage of telecommunication firms = 4.870 + 0.353 (Market development) + 0.234 (Product development) + 0.208 (Strategic alliances) + 0.062 (Process automation)

5.1 Conclusion

The study concludes that process automation and product development are positive and significant strategic responses that enhance the competitive advantage of telecommunication firms in Nairobi City County. While process automation positively influences competitiveness through improved operational efficiency, streamlined distribution, and reduced market entry costs, its effect is most impactful when integrated into broader organizational restructuring rather than implemented in isolation. Product development through differentiation, introduction of innovative products, and adoption of advanced technology in production processes enables firms to meet evolving consumer demands and attain higher market share. Telecommunication firms that continuously innovate their product portfolios and leverage modern operational systems to improve quality demonstrate superior competitive positioning compared to those relying on existing offerings without deliberate product improvement or diversification strategies.

The study further concludes that market development and strategic alliances are significant and positive strategic responses that substantially drive competitive advantage among telecommunication firms in Nairobi City County. Market development through market penetration, customer segmentation, online advertising, and effective information sharing enables firms to expand their customer base, increase market share, and diversify revenue streams. Strategic alliances through partnerships, joint ventures, and technology-sharing agreements provide firms with access to specialized capabilities, advanced technologies, and innovation opportunities that would be prohibitively expensive or difficult to develop independently. Together, these external-facing strategic responses complement internal capabilities and are essential for sustaining competitive advantage in Kenya's highly dynamic and competitive telecommunication sector, where technological disruption and market volatility continuously demand sophisticated and proactive organizational responses.

6.1 Recommendations

The study recommends that telecommunication firms should prioritize adoption of process automation through organizational restructuring, cycle time reduction, and integration of artificial intelligence, robotic process automation, machine learning, and both frontend and backend automation systems. Automation should be viewed not merely as an efficiency tool but as a strategic competitive weapon that streamlines distribution, reduces market penetration costs, and enables rapid responses to market changes. Simultaneously, firms should invest deliberately in product development through continuous diversification of product features, quality improvement, and adoption of advanced technologies in production processes. Rather than relying on existing offerings, firms should establish structured product innovation pipelines informed by customer feedback and market research, ensuring that new products are consistently introduced to meet evolving consumer needs and maintain competitive differentiation in a rapidly changing telecommunications landscape.

In addition, the study recommends that telecommunication firms should intensify market development efforts through proactive market penetration strategies, demographic segmentation, investment in online advertising platforms, and development of robust information sharing systems that facilitate efficient customer acquisition and retention. Firms should view market development not as a reactive measure but as a sustained strategic investment that diversifies revenue streams and reduces dependence on existing markets. Furthermore, firms should formalize and expand their strategic alliance frameworks by establishing partnerships with technology

providers, content firms, fintech companies, and infrastructure sharing organizations through joint ventures with clear shared goals, defined performance metrics, and structured accountability systems. Strategic alliances should be governed by formal agreements that maximize collaborative knowledge transfer, shared asset utilization, and joint innovation, enabling telecommunication firms to build sustainable competitive advantages that rivals cannot easily replicate or undermine in volatile market conditions.

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