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Interplay of Product and Technological Innovation Strategies for Performance Improvement among Government Parastatals in Kenya

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Abstract:

Many Kenyan parastatals struggle with financial challenges, including EPZA Athiriver. This study explores how effective innovation strategies can improve performance and address declining revenue issues. The purpose of this paper was to assess the influence of product and technological innovation strategies on the performance of government parastatals. A descriptive research design employed structured questionnaires administered to a stratified random sample of 109 employees from Finance, Human Resources, and Marketing departments, of government parastatals in Kenya. The findings of the regression analysis revealed statistically significant positive relationships between Product Innovations and Performance ($\beta=0.48$, $p\text{-value}=0.0137$), highlighting the critical role of product innovation in driving performance improvements, as well as technological Innovations and Performance ($\beta=0.41$, $p\text{-value}=0.0235$), affirming technological innovation as a crucial factor in enhancing performance. The study affirms that both product and technological innovation strategies significantly impact the performance of government parastatals. These findings emphasize the transformative potential of strategic innovation for government parastatals and offer valuable insights for revitalizing their financial health.

Keywords: Innovation strategies, product innovations, technological innovations and parastatals

1. Introduction and Background of the Study

In the contemporary economy, innovation strategies have become paramount as the principal wellspring of competitive advantage. The economic growth of any nation is intrinsically tied to innovation, as it catalyzes industrial competitiveness, profoundly influences business success, and significantly contributes to a country's overall economic advancement (Rasheed et al., 2020). Proficiency in innovation strategies is now a fundamental requirement for professionals in the field of business administration. This proficiency empowers businesses to make judicious decisions regarding the allocation of resources, ultimately driving innovation objectives, delivering value to customers, and establishing a commanding edge in the market.

An innovation strategy represents a holistic blueprint with a unified innovation goal to engender fresh value propositions that resonate with customers and warrant their investment. This strategy assembles directives and practices meticulously designed to cultivate future organizational expansion (Elkins, 2021).

It is well-established that successful innovations wield a substantial influence over a company's financial and economic performance, notwithstanding the inherent risks and uncertainties that innovation endeavors may entail (Laban & Deya, 2019). The origins of this profound association between innovation and progress can be traced back to the period following the Industrial Revolution, which spanned from 1760 to 1840. During this era, the creation of novel technologies, products, and processes became intrinsically linked with the concept of innovation. Governments, recognizing the economic value inherent in innovative pursuits, began to endorse research facilities and the patent system. This ongoing commitment to innovation has elevated innovators to the status of significant contributors to societal advancement. Illustrating the global importance of this field, numerous conferences focused on innovation, such as the 40th IASP World Conference on Areas of Innovations held in Luxembourg City this past September, continue to convene. Hence, innovation strategy is not a novel concept; it has gained considerable prominence in contemporary organizations. The proactive pursuit of innovation is instrumental in their success and the enhancement of their overall performance. Moreover, global innovation initiatives serve as catalysts for long-term growth and bolster the competitiveness of businesses on a global scale.

1.1. Product and Technological Innovations and Performance of Government Parastatals

In the realm of innovation strategies, their profound impacts resonate powerfully, leaving an indelible imprint on the consumers, which comprise the primary focus of this research (Anna & Fang, 2016). These impacts encompass a wide spectrum, including the dynamic landscape of marketing innovation, the ever-evolving landscape of customer needs,

heightened levels of customer awareness, astute market exploitation, seamless inter-functional collaboration, the flexibility inherent in strategic approaches, the introduction of innovative products, and mastery of cutting-edge technologies.

A noteworthy case in the realm of state-owned enterprises that have wholeheartedly embraced innovation strategies is the United States Postal Service Office (USPS). This government agency demonstrates unwavering commitment to enhancing customer satisfaction through the strategic deployment of research and development (R&D) initiatives and innovative marketing tactics (United States Postal Services [USPS], 2022). These innovative strategies engender accessibility to an array of services, software enhancements, and advanced delivery modalities, manifesting in a tangible expansion of the USPS's presence with the inauguration of numerous branches across diverse states. This expansion serves as a compelling testament to the amplified overall performance driven by innovative strategies (USPS, 2022).

Further afield, Fuller et al. (2019) spotlight Alibaba Ltd, a multinational Chinese corporation that has carved a niche in the online domain. This entity remains resolute in its commitment to continuous investments in R&D and marketing innovations, a steadfast approach that augments its efficacy in facilitating transactions spanning the domains of business-to-business (B2B), business-to-customer (B2C), and customer-to-customer (C2C). This unswerving dedication to pioneering technologies culminates in a sustained augmentation of its customer base, with seamless access to their application fostering convenient and efficient purchases.

Meanwhile, in the Australian context, Cobram Estate Olive Ltd. (CES, 2020) ardently pursues innovation strategies, particularly emphasizing technological advancements and R&D initiatives. These strategic imperatives result in enhanced operational efficiency and heightened customer satisfaction, thereby catalyzing an upswing in overall business performance.

In sub-Saharan Africa, a remarkable transformation unfolds, fundamentally altering the dynamics of evaluating financial products. Innovative strategies, underpinned by Information and Communication Technologies (ICTs), represent the fulcrum of this transformation (Abor, 2018). Nevertheless, businesses in this region continue to grapple with the multifaceted challenges tied to the implementation of innovation strategies. The scarcity of experts and the paucity of financial resources to sustain ongoing R&D endeavors pose formidable barriers in aligning businesses with the ever-evolving business landscape (Albers et al., 2018).

Within the Kenyan context, Njeru (2018) underscores the pivotal role of innovation strategies, spanning the gamut from marketing innovations to R&D initiatives, product innovations, and technological advancements, in shaping the nation's overall performance landscape. Notably, Kenya Airways, as a prominent parastatal, stands at the vanguard of transformative change. The airline's strategic repertoire includes a wholehearted embrace of innovation strategies to broaden its customer base and invigorate its operational performance.

Findings elucidated by Njeri (2021) unveil the impressive strides taken by Jomo Kenyatta International Airport, as it adeptly integrates innovation strategies covering market innovations, R&D initiatives, and technological innovations. These strategic endeavors synergistically yield superior services for their customers. This commitment to innovation translates into a remarkable surge in performance, as evidenced by the robust growth in revenue, reaching an impressive 31.91% in contrast to the preceding years (27.6% in 2021 and 29.78% in 2022). This tangible growth underscores the affirmative correlation between innovation strategies and organizational performance.

1.2. Statement of the Problem

According to Export Processing Zone Authority (EPZA 2022), a government parastatal, the potential export market has decreased. As a result, total sales stood at Kshs 77,189 million in 2022 from Kshs 77,270 million in 2021, while the value of exports was Kshs 68,572 million from 72,390 million in 2022. There has been competition with other parastatals in the economy as each parastatal aims to raise high revenues for the economy; parastatals like Kenya Airways, Kenya Wildlife Service, and Kenya Power Lighting Company are highly competing to perform better in the Kenyan economy. In 2022, Kenya Wildlife Service (KWS) recorded about Sh268.1billion, Kenya Power Lighting Company (KPLC) raised about Sh157.35billion within the financial year of 2022, and Kenya Air Ways (KA) raised about Sh998 million, while EPZA recorded the least revenue with Sh115.3 billion (Daily nations 2022). According to Biketi et al. (2021), innovation strategies are not fully utilized by Government parastatals in Kenya due to the fact that they have several challenges coming from implementation strategy. Government parastatals in Kenya need to strengthen their innovation tactics to meet both their long-term and short-term goals within a given time frame to increase their performance. Muthoni (2018) undertook a study on innovation strategies and the competitive advantage of Safaricom Kenya Ltd. and found out that innovation strategies lead to better performance. Research by Bachang'a (2018) on innovation strategies in Kenya Power Ltd discovered that innovation strategies help increase market share, which leads to improved performance of a business. Most of these studies were done about five years ago, using different theories, and none of the aforementioned studies adopted the main theory used for this study, thereby leaving a research gap that this study seeks to address. Moreover, the parastatals they focused on do not offer the same services.

1.3. Purpose of the Study

The purpose of this study was to assess the effect of product and technological innovation strategies on the performance of Government parastatals in Kenya.

2. Literature Review

2.1. Theoretical Framework

2.1.1. Resource-Based View Theory

The inception of the Resource-Based View (RBV) theory in 1977 by Wernerfelt marked a pivotal moment in understanding how a firm's resources are the ultimate determinants of its performance. This theory accentuates the notion that companies equipped with valuable, rare, and inimitable resources and competencies gain a competitive edge, thereby achieving superior performance (Wernerfelt, 1984). The cardinal attributes of such resources include rarity, costliness, inimitability, and a lack of easy substitutes. Rarity signifies that only a select few possess these resources, granting a competitive advantage. Valuable resources enable a firm to effectively navigate industry challenges and opportunities. The RBV theory posits that through strategic accumulation and utilization of resources, innovation strategies can yield a sustainable competitive advantage as long as they cater to consumer needs in ways that are difficult to imitate or substitute. Consequently, firms proficient in implementing innovation strategies, such as R&D, market innovations, product innovations, and technological advancements, are better poised for success. According to Forcadell and Aracil (2021), RBV empowers firms to choose the most suitable innovation strategies, enhancing overall performance. Ahmed and Othman (2017) asserted that RBV strengthens a firm's resources, elevates its competitive capabilities, and augments its performance.

Nevertheless, this theory is not without its detractors. Critics highlight its shortcomings, such as the absence of insights into resource evolution over time and their adaptability in the face of environmental uncertainty (Wade & Hulland, 2020). Connor (2002) posits that RBV primarily pertains to large firms with substantial market power, contending that smaller, more agile firms' Sustainable Competitive Advantage (SCA) cannot hinge solely on their static resources, thereby falling outside the RBV's scope. Barney (2002) also expounds upon RBV's limitations, noting that it applies only in relatively stable industries. In dynamic and unpredictable environments, where new technologies and markets continuously emerge, the value of resources can drastically shift, necessitating a broader framework to expound on a firm's SCA.

2.2. Empirical Literature

An empirical literature review provides insights from previous studies related to the current research (Mutua & Kibe, 2022). Moshi's (2018) study investigated the influence of innovation strategies on the performance of Vodacom Tanzania PLC. The study assessed four innovation strategies, which significantly improved the firm's effectiveness. The categories of innovation strategies examined included product innovation, marketing strategies and technology innovation. The study's findings underscored the substantial impact of innovation strategies on firm performance. While the study was conducted in Tanzania, the present research yielded similar results, albeit within a different context.

Aziz and Samad (2016) conducted research to ascertain how innovation tactics affected the success of small and medium-sized food processing businesses in Malaysia. Their findings revealed that product innovation had a beneficial impact on business success, enhancing organizational effectiveness. Notably, the study's approach was methodologically sound, although it focused exclusively on one type of innovation while excluding process, marketing, and technical innovations. Moreover, the study was conducted in Malaysia, where businesses may face unique challenges.

Mugo and Macharia (2021) conducted a study on technological innovation and its impact on firm performance in Kenya. The study's findings indicated a significant positive relationship between technological innovation and firm performance. Mutie (2018) delved into the effect of technological innovations on the organizational performance of government agencies in Kenya. The correlational analysis results unveiled a statistically significant and positive correlation between technological innovation strategies and performance. Furst, Lang and Nolle (2017) conducted a study on the significance of technological innovation and its influence on firm performance in the United States. Their research encompassed various companies from five countries: France, England, Germany, the United States, and Japan. The findings concluded that technological innovations exerted a positive and significant effect on a firm's performance.

2.3. Conceptual Framework

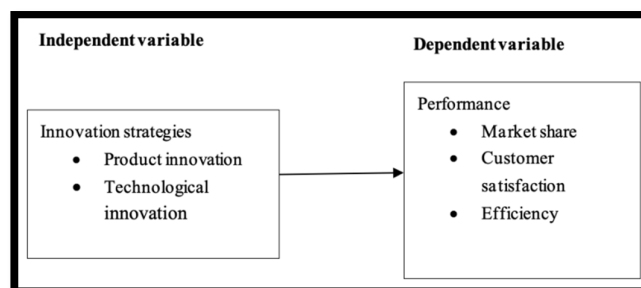


Figure 1: Conceptual Framework
Source: Mutua and Marus (2023)

3. Research Methodology

Utilizing a descriptive research design, data collection was meticulously conducted through the administration of structured questionnaires, employing the stratified random sampling method. The research encompassed a general population of 30,000 employees, with the specific target population consisting of 150 employees from the Finance, Human Resources, and Marketing departments. From this target population, a sample size of 109 employees was thoughtfully selected for inclusion in the study. The subsequent data analysis phase was undertaken using SPSS version 29, incorporating essential descriptive measures such as mean, mode, and standard deviation and advanced inferential techniques, including Pearson correlation and linear regression.

It is essential to underscore the profound significance of ethical considerations when deliberating matters of data sharing and privacy. Researchers must be acutely aware of the ethical imperatives that guide their work, recognizing the importance of securing the confidence and trust of the general public and their peers. Adhering to a well-defined code of conduct, as articulated by Mutua and Kibe (2022), is an essential component of this research study. This rigorous commitment to research ethics and ethical standards was at the forefront of every aspect of this investigation, ensuring the responsible and principled conduct of the research.

4. Data Analysis, Presentation and Interpretation

4.1. Product Innovation Strategies

Innovation Statements		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Your organization actively engages in product research and development.	Frequency	23	31	34	14	7
	Percentage	21%	28%	31%	13%	6.4%
Your organization's enhanced product features have increased customer satisfaction.	Frequency	13	47	37	11	1
	Percentage	12%	43%	34%	10%	0.9%
Your organization provides products with more enhanced features than its competitors.	Frequency	21	43	34	9	2
	Percentage	19%	39%	31%	8.3%	1.8%
Your organization offers more innovative products and services to its customers compared to its competitors.	Frequency	35	43	27	4	0
	Percentage	32%	39%	25%	3.7%	0%

Table 1: Product Innovation Strategies
Source: Mutua and Marus (2023)

The illustration in table 1 reported that the majority of respondents (34), representing 31%, were neutral, while 31(28%) respondents agreed, 23(21%) strongly agreed, 14(13%) disagreed, and 7 (6.4%) strongly disagreed to the statement that their organization actively engages in product research and development. The findings also revealed that most of the respondents (47), representing 43% of the total respondents, agreed with the statement that their organization's enhanced product features have increased customer satisfaction, while 37(34%) were neutral, 13(12%) strongly agreed, 11(10%) disagreed, and 1 (0.9%) strongly disagreed to the statement. The findings show that most of the respondents agreed with this claim, which indicates that Government parastatals in Kenya are offering good products to their customers, increasing customer satisfaction. Guo and Wei (2018) opined that organizations should aim at offering the best to the market to increase their performance. However, most of the respondents (43), representing 39% of the total respondents, agreed, 34 (31%) were neutral, 21(19%) strongly agreed, 9 (8.3%) disagreed and 2 (1.8%) strongly disagreed to the statement that their organization offered superior services than their competitors while offering innovative products and services than their competitors. On the statement that your organization offers more innovative products and services to its customers compared to its competitors, most respondents (43), representing 39% of the total respondents, agreed, 35 (32%) strongly agreed, 27 (25%) were neutral, 4(3.7%) disagreed, and 0 (0%) strongly disagreed. The findings in this current study confirmed the Resource-Based view theory in a study by Zari (2018). The theory is very appropriate for implementing innovation strategies in various organizations; it serves as an eye-opener and urges organizations to adopt the best resources in a fast-changing environment. The findings were confirmed by a study by Uiih and Arshad (2021), who researched the effect of internal innovation in determining firms' performance in Pakistan's textile industry. Findings revealed a significant positive relationship between product innovation and performance. The findings also confirmed with Machuki (2019), who did a study on product innovation and performance of Kenyan medium-sized companies. His results revealed a positive impact on product innovations and the firm's performance. This implies that product innovation strategies are essential for any successful business.

4.2. Technological Innovation Strategy

Innovation Statements		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Your organization has adopted new technology in organizational operation.	Frequency	28	41	31	8	1
	Percentage	26%	38%	28%	7.3%	0.9%
Your organization has adopted a new technology in product development.	Frequency	22	35	38	13	1
	Percentage	20%	32%	35%	12%	0.9%
Your organization has adopted new forms of technology across all departments.	Frequency	30	42	20	16	1
	Percentage	28%	39%	18%	15%	0.9%
Your organization has adopted unique technology to improve internal production process.	Frequency	37	38	29	5	0
	Percentage	34%	35%	27%	4.6%	0%

Table 2: Technological Innovation Strategies
Source: Mutua and Marus (2023)

The results in table 2 indicated that most respondents (41), representing 38% of the total respondents, agreed, 31(28%) were neutral, 28(26%) strongly agreed, 8 (7.3%) disagreed, and 1(0.9%) strongly disagreed to the statement that their organization has adopted new technology in organizational operation. It was also shown that most respondents (38), representing 35% of the total respondents, were neutral, 35(32%) agreed, 22(20%) strongly agreed, 13(12%) disagreed, and 1(0.9%) strongly disagreed to the statement that their organization had adopted new technology in product development. Moreover, the findings also revealed that the majority of the respondents (42), representing 39% of the total respondents, agreed, 30(28%) strongly agreed, 20 (18%) were neutral, 16(15%) disagreed, and 1(0.9%) strongly disagreed that the organization adopted new technologies across all departments. Nevertheless, results also show that most of the respondents (38), representing 35% of the total respondents, agreed, 37(34%) strongly agreed, 29(27%) were neutral, 5(4.6%) disagreed, and 0(0%) strongly disagreed that their organization had adopted unique technology to improve internal production processes. The Findings of this section confirmed with Mugo & Macharia (2021), who conducted a study on technological innovation and firm's performance in Kenya, and the study's findings indicated a significant positive impact on technological innovation and firm's performance. The results were also confirmed with a similar study by Mutie (2018), who researched the effect of technological innovations on the organizational performance of Government Agencies in Kenya and found that technological innovations have positive impacts on organizational performance.

4.3. Correlation Analysis

		Organization Performance	Market Innovation	R&D Innovation	Product Innovation	Technological Innovation
Organization Performance	Pearson Correlation	1	.97	.88	.78	.89
	Sig. (2-tailed)		.003**	.005**	.0024**	.004**
	N	109	109	109	109	109
Product Innovation	Pearson Correlation	.78	.023	.275**	1	-.115
	Sig. (2-tailed)	.0024**	.814	.004		.235
	N	109	109	109	109	109
Technological Innovation	Pearson Correlation	.89	-.017	-.042	-.115	1
	Sig. (2-tailed)	.004**	.860	.661	.235	
	N	109	109	109	109	109

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

Table 3: Pearson's Correlation Analysis Table
Source: Mutua and Marus (2023)

The correlation analysis results illustrated in table 3 indicated that market innovations had a direct and statistically significant correlation with organizational performance ($r = .97$, $\text{sig} = 0.003$). The results meant that organizational

performance was directly impacted by market innovations. Marketing strategies and innovations had a strong and direct impact on the performance of the organization. Technological innovations reported a strong direct statistically significant correlation with organization performance ($r = 0.89$, $\text{sig} = 0.004$). The result meant that any innovations or efforts in technological innovation strategies led to improvement in organizational performance. Product innovations reported a strong direct Pearson's correlation coefficient that was statistically significant ($r = 0.78$, $\text{sig} = 0.0024$).

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.235	.575		3.885	.000		
	Market Innovation	.054	.058	.87	.923	.0358	.997	1.003
	R \$ D Innovation	.104	.069	.47	1.499	.0137	.922	1.085
	Product Innovation	.141	.094	.48	1.500	.0137	.914	1.095
	Technological Innovation	.109	.091	.41	1.194	.0235	.987	1.014

Table 4: Model Coefficient
Source: Mutua and Marus (2023)

The results showed that product innovations led to a 48% increase in organization performance, and the impact of technological innovation on company performance was statistically significant ($\beta=0.48$, $t = 1.5$, $p\text{-value} = 0.0137$). The results of technological innovations reported that a one-unit increase in technological innovation led to a 0.41 statistically significant improvement in organizational performance ($\beta=0.41$, $t = 1.194$, $p\text{-value} = 0.0235$). Multi-collinearity was determined using the variance inflation factor and tolerance. A variance inflation factor of less than 10 indicates that multi-collinearity is non-existent. The variance inflation factor for all covariates ranged between 1.002 and 1.005, thus indicating non-multi collinearity.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.959	4	.740	12.035	.0195b
	Residual	37.798	104	.363		
	Total	40.756	108			
a. Dependent Variable: Organization Performance						
b. Predictors: (Constant), Technological Innovation, Market Innovation, R&D Innovation, Product Innovation						

Table 5: ANOVA
Source: Mutua and Marus (2023)

The ANOVA summary illustration in table 5 reported an F-statistic of 12.035 and a significance p-value of 0.0195. The p-value, 0.0195, was less than 0.05, the 95% confidence interval, thereby indicating that the model was statistically significant by performing better than a model only containing the intercept.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.69a	.73	.70	.603
a. Predictors: (Constant), Technological Innovation, Market Innovation, R&D Innovation, Product Innovation				

Table 6: Model Summary
Source: Mutua and Marus (2023)

The model summary illustrated in table 6 indicated that the model predictors accounted for 73% of variability in organizational performance ($R^2 = 0.73$). Technological innovation, marketing innovation, R&D, and product innovation accounted for 73% of the variability in organizational performance. Therefore, the accounted variability was 73%, and the residuals or unexplained variability in organizational performance was 27%.

5. Conclusion and Recommendations

The results indicated that all these innovation types were adopted in the organization. This implies that the government parastatals in Kenya have been employing innovation strategies to capture new markets and increase market shares. However, the organization did not engage in aggressive anti-competitors' campaigns nor did the parastatals engage in rebranding engagements. Furthermore, the findings indicated that the firm is reluctant when it comes to using efficiency and market share to measure its performance since some of the employees agreed to these statements. Based on the third objective of the study, which was to determine the effect of innovation strategies on performance, it was found that innovation strategies play a bigger role in impacting the performance of this organization. The parastatal mostly applied R&D innovation, Market innovations and technological innovation strategies.

The study suggests that parastatals take swift measures to enhance innovation by seriously evaluating recent innovation abilities and performance and developing a surrounding that will foster innovations within the organization so that the full potential of innovation strategies may be recognized. For the firm to grow further and apply market and R&D innovation strategies, the study recommends Government parastatals in Kenya management on how to achieve enhanced performance, grow the number of customers, and increase sales. This study aimed to close the knowledge gap by evaluating the impact of innovation initiatives on the performance of government parastatals. The study recommends that similar studies be conducted in other sectors of the economy; this is because this study was focused only on government parastatals. The study recommends that a similar study be carried out to determine the impact of additional innovation strategies that were not employed in this study.

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