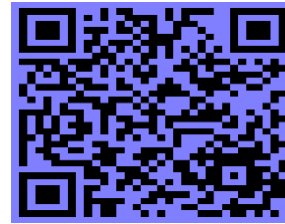


Influence of Technological Capability on the Performance of Pharmaceutical Companies in Kenya



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Abstract

Aim: The pharmaceutical companies operating in Kenya have not been spared by the environmental turbulence and increased competition since liberalization of the industry. The main objective of the study was to assess the effects of technological capability on the performance of pharmaceutical companies in Kenya.

Methods: The population comprised the 415 pharmaceutical companies that are operating in Kenya. The study used stratified random sampling with sample size of 103 respondents. The study targeted both manufacturers and distributors. Primary and secondary data was collected using a questionnaire covering the five variables and background information. The data was analysed using SPSS version 23.0, descriptive statistics was computed using mean, frequencies, percentages and inferential statistics to test the relationship between the study variables.

Results: The correlation analysis revealed that there was a positive and significant association between technological capability and firm performance ($r = 0.685$, $p = 0.000$). Regression of coefficients results revealed that technological capability and firm performance are positively and significantly related ($\beta = 0.603$, $p = 0.000$). This implies that a unit increase in technological capability would lead to increase in firm performance by 0.603 units.

Conclusion: Technological capability of a firm stands to be one of the main determinants of how well the organization performs in terms of efficiency and effectiveness.

Recommendations: Pharmaceutical companies should embrace information technology by bringing modern and automated means of production as well as information sharing platforms that create the uniqueness, efficiency and effectiveness of their firms.

Keywords: *Pharmaceutical companies, technological capability, performance.*

INTRODUCTION

Strategic capabilities describe the ability that a firm possesses in building and extending primary capabilities to enable them align their operations competitively within the environment characterized by high changes. Any transgression in focusing on these abilities that can avail competitiveness makes it difficult for the firm to apply the scarce, valuable, capabilities which may not be easily replicated or copied by the competition. Hence the ability for the organization to continuously create resources and capabilities capable of yielding competitive position in the industry (Tarutė & Gatautis, 2014).

At the center of the growth and rapid expansion of these firms are unique resources; financial and human resources, intellectual capabilities among other strategic capabilities. Wamba et al (2017) define strategic capabilities as the firm's capacity to deploy internal resources and integrate external resources that have been coordinated purposely to achieve a firm's goals. Strategic capabilities are indicated by the degree to which firms can contribute to the development of core competences, competitive advantage, and, ultimately, firm performance.

According to Mikalef and Pateli (2017), different types of resources (organizational, physical, human) contribute in various ways to a firm's performance depending on how they are organized or deployed. The concept of capabilities is about the organization's skills to organize these resources (tangible and intangible assets) in order to achieve strategic goals and objectives. These capabilities, according to Wamba et al (2017) are groups of skills and knowledge accumulated over time and that are employed through the firm's processes that enable the organization to coordinate activities and make use of its assets. This study focuses on technological capability and the impact these capability have on the performance of pharmaceutical companies in Kenya.

Performance is the key achievement of an organization in the realization of efficiency and effectiveness and with the ability of remaining focussed on its goals (Carlson, 2017). Performance provides the basis for an organization to assess how well it is progressing towards predetermined objectives, identify areas of strength and weakness and decide on the future initiatives with the goal of how to initiate performance improvement (Cassidy, 2016). According to Hakimpoor (2014) Organizational performance is viewed in multi-disciplinary context such as quality of output, speed in delivery of services and products, increase in market share, good financial results, survival in the turbulent environmental and market changes and high rates of returns and profit.

Pharmaceutical companies are trying to keep pace with changes brought about by digital technology. Historically, pharmaceutical companies have controlled both the generation and dissemination of information about their products. Digital technologies have weakened that control, opening an array of new, independent information channels. In response, pharmaceutical companies have to build the capabilities to anticipate or react rapidly to these new sources of evidence, and remain the main source of authority on the performance of their products.

Pricing control has been used in most countries both developed and emerging markets. This involves the regulator seeking to reduce the cost of pharmaceuticals through pricing and legislation as happened in South Africa (Aspen, 2014). The great recession of 2008 and its impact on the pharmaceutical industry were external in nature, over which the industry had very little control. However, the industry itself is responsible for internal factors like decline in R&D spending. Quintile IMS report indicates that the USA slowed down to single digits between 6% and 9% through to 2021, down 12% in 2015. The slow growth was attributed to high drug prices. As per

US Food and Drug administration (FDA) center for drug evaluation and research (2010) the approvals for new drugs in the market has dropped from 35 new medicines a year to an average less than 20 new medicine as much as US remains the world's largest market for pharmaceuticals.

The Kenyan pharmaceutical industry is evolving and like any other business operating in a liberalized market, enormous challenges exist. These challenges include competition among the players in the industry, competition from generic drugs, counterfeits, slower registration process and parallel importation on pharmaceuticals products. However, the industry players need to grow and succeed in this changing environment. In light of these, there is a great need for each organization's top management to understand the industry's critical success factors that would lead to growth and profitability enhance their areas of strength and address areas of weaknesses and formulate and implement effective strategies to counter the challenges brought about by the ever-changing business environment. It would therefore be important to identify the critical success factors of this industry.

As competitive pressures increase, marketing skills have never been more highly valued by organizations in both the public and private sectors. What many used to see as a departmental activity within companies is regarded as frontline business attitude of mind in all employees (Schwepker & Schultz, 2015). The management once committed to a strategy will ensure sufficient resources like time and finances, and support from all teams is given to the strategy which will ensure its success. Firm commitment and structure also involve creating team's cohesion leading to higher performance. (Dzisi & Ofosu 2014). Pharmaceuticals are specialized and costly products, being major components of local and international trade: a major health investment for the government and development partners and key health expenditure for the households (Gunday, 2015). The key objective of this study is to determine strategic capability of pharmaceutical firms in Kenya and the effect of performance.

The challenges experienced in Kenyan pharmaceuticals include over-regulation of the industry with regulatory authorities such as PPB, National Quality Control Laboratory (NQCL), Drug Analysis and Research Unit (DARU), dwindling investment in Research and Development and limited technology. The pharmaceutical industry should also take advantage of the e-marketing and the booming opportunity of social media to showcase their products (Rodriguez, Peterson & Ajjan, 2015).

Pharmaceutical companies are regulated by the Pharmacy and Poisons Board (PPB) which was formed as an act of parliament under the Pharmacy and Poisons Act 244 in the Kenyan laws. Regulation is done in terms of manufacturing, transportation and trading of drugs, with the hope of achieving high standards in quality, safety and efficacy (Pharmacy and Poisons Board, 2016). The sector has grown over the years and according to the report by KNBS (2015), it employs over 3000 staff in production and distribution of pharmaceutical products in and out of the country.

Pharmaceutical manufacturers are finding it difficult to attain World Health Organization prequalification because of financial and technical constraint, UNIDO (2015). The Kenya Economic Survey of 2015 estimated that the contribution to the GDP by the manufacturing sector stands at 11% which explains the favorable environment policies and campaigns in place to encourage the growth of the sector.

Statement of the Problem

The pharmaceutical companies in Kenya has experienced steady growth especially with the government's effort to develop, grow and expand the sector, which has contributed to the growth in GDP by 3.2% (Kale, 2012). However, the pharmaceutical marketing industry is faced with many challenges ranging from globalization which has heightened the level of competition. In particular, the pharmaceutical industry in Kenya is faced with slow process of registration of drugs, rampant parallel importation especially for established brands, and constant product substitution at the pharmacy level. These coupled with the demand for higher profit margins for firms engaged in importation makes the entire supply chain less profitable (Nganga, 2018).

Firms develop their technological capability in an incremental way, and in doing that, they are limited to continue to do what they already know, which means there is a cognitive limit to what a firm is capable of doing. Therefore, the concept of technological capability embraces the generation of new knowledge and learning. Several studies on pricing strategic capabilities of pharmaceutical firms have been conducted within and outside of Kenya. Onyango (2014) assessed the strategies employed by pharmaceutical manufacturing companies in Nairobi Kenya in addressing marketing challenge and noted over-regulation limited technology in usage as the main challenges. Most previous studies have focused on the different marketing and pricing challenges faced by pharmaceutical firms in Kenya and abroad, few studies have focused on the technological capability and its effect on the performance of pharmaceutical firms in Kenya, a study gap the present study aimed to fill.

Objectives of the Study

1. To assess the influence of technological capability on the performance of pharmaceutical companies in Kenya
2. To assess the moderating effect of firm characteristics on the technological capability and performance of pharmaceutical companies in Kenya.

Research Hypothesis

H₀₁: Technological capability has no significant influence on the performance of pharmaceutical companies in Kenya

H₀₂: Firm characteristic has no significant moderating influence on the technological capability and performance of pharmaceutical companies in Kenya.

LITERATURE REVIEW

Theoretical Review

The Innovation Diffusion Theory

The Innovation Diffusion Theory created by Rogers (2004) show that individuals adopt procedures that integrate innovation. The theory focuses mainly on the processes which determine a society's adoption innovation to increase the spread in a community. The innovation decision process is the procedure that people experience which includes; innovation knowledge, formation of attitudes towards the knowledge, choices to either accept or reject it, the application of original knowledge, as well as validation of the decision. Roger (2004) further explained that the reason that make some individuals to use technological change and adopt innovations easily than others may be clarified by the submission of diffusion of innovations theory. Rogers' indication that innovation

diffusion has led to social change proves that it tremendously depends upon the person who are involved in the adoption of the innovation.

It is evident that the diffusion of innovation context is appropriate for the research of the innovation process in the pharmaceutical industry. The diffusion of innovation theory helps us understand how pharmaceutical firms integrate innovation in their culture. It will help explain innovative processes adopted by pharmaceutical firms. It will also help us understand the place of innovative capability in the firm. This study will therefore use the theory to help explain how information and technology capabilities are crucial in determining the performance of pharmaceutical companies in Kenya.

Empirical Review

Olubunmi et al (2015) studied the application of Information and Communication Technology (ICT) in pharmaceutical product marketing in Nigeria. Data for the study was obtained from 76 pharmaceutical firms in southwest Nigeria which comprised of about 95% of the pharmaceutical companies that were into manufacturing of drugs in Nigeria. The study found that pharmaceutical companies were using considerable ICT for their product marketing especially customized software. Parida, Oghazi and Cedergren (2016) conducted a study on how dynamic capabilities of ICT can be influenced. The results show that ICT capabilities have an impact on small firms' dynamic capabilities. More specifically, the use of ICT for internal efficiency positively influences the ability to adopt, the collaborative use of ICT positively influences the ability to network, and the use of ICT for communication positively influences both adaptive and innovation capabilities. Consequently, the results suggest that the various components of ICT capabilities facilitate the development of the various organizational capabilities that together represent dynamic capabilities and can thus contribute to the competitive advantage of a small business.

Wamae and Kungu (2014) assessed the pharmaceutical manufacturing in Kenya focusing on the key trends and developments. They study examined the influence of Information Communication Technology adoption in marketing of pharmaceutical products by pharmaceutical manufacturing firms in Nairobi and specifically investigated the influence of email, website and computerized communication and social media in marketing of pharmaceutical products. From the findings, it was concluded that employee competences in email, website and computerized communication was poor and therefore negatively affected ICT adoption in marketing. It is necessary for the companies to enhance staff competences in use of email, websites and computerized communication. It was found that social media could help to improve the marketing of the products.

According to Wamae and Kungu (2014), there was need to consider employees' opinions on how to enhance social media adoption in marketing. The companies embraced social media marketing but the employees did not possess necessary knowledge to embrace the technology. In their recommendation, they suggested that it was necessary for the staff to have experience in ICT adoption in marketing of the pharmaceutical products in order to better their performance. The companies should come up with developmental opportunities in form of workshops to enlighten the employees on how to benefit from ICT adoption in marketing. Future studies in this area are required to provide more insights into the nature and score of relationships between adoption of ICT technology and performance of pharmaceutical companies in Kenya.

Magutu, Aduda and Nyaoga (2015) sought to determine whether supply chain technology moderated the relationship between supply chain strategies and firm performance using large-scale manufacturing firms in Kenya. They found that the social media has recently transformed how corporate interact. It has enabled firms to interact promptly with shareholders, bringing change of the usual same output of communication in organizations, to a prolonged negotiation between organization and customer. This study also aimed at analyzing the association between social media and marketing, specifically concentrating on adoption of social media for Public relations and examining the variations that had happened in pharmaceutical business from using social media. Marketing by using social media comprises the adoption of it in marketing, public relations and customer service, showing a conjunction of these conventionally distinct organization departments.

Elijah, Bwana and Magoyi, (2014) examined the effects of information communication technology on the procurement of pharmaceutical drugs in public hospitals in Kenya. Their findings indicated that firstly; websites had no less than different devotions. The first is a connection in the existing off-line services, targeting maximum acceptance of the services. The second is to act as a change, seeking to take the pressure away from these off-line services by diverting users to other, usually web-based resources where their needs can be met. The third is an improvement of diversion, seeking to deliver on-line guidance within the site itself. There exist two-way of communicating that can be done with customers. Outbound internet-based communications being the main one where a company may adopt website to collect data about clients and use the email to interact with customers through sending classified information. Second, is the incoming internet based on communication which offers the capability for clients to query and solve the challenges by transferring e-mails or web-based form-filling. Most importantly, the internet can be adapted to upkeep the purchase choice with innovative methods

Madani et al (2014) conducted a study to identify the factors affecting technological capabilities of Iran's pharmaceutical industry for accelerating the transition to bio pharmaceuticals. Results derived from the analyzed data shows that the national technological and scientific environment, business environment, infrastructure and legal requirements, and international collaboration were the most important factors affecting the technological capabilities of Iran's pharmaceutical industry.

Kale and Little (2007) analyzed how the Indian pharmaceutical industry have moved along the R&D value chain and how the industry has made a shift from an importer to an innovator of drugs. Results show that the Indian government's industrial and technology policies along with changes in regulation of intellectual property rights played a crucial role in shaping this development of R&D capability. Results also show that the basic and intermediate technological capabilities gained from imitative learning gave these firms a solid base for development of competence in advanced innovative R&D.

Kale (2012) analyzed the social processes adopted by Indian pharmaceutical firms to develop competencies in innovative R&D as a response to change in patent law. A case study methodology was used to find answers for questions raised in the research. Firms which had filed New Drug Application (NDA) in both USA and India were selected as case studies. Results show that Indian pharmaceutical firms are developing capability in innovative R&D by acquiring new components of knowledge and reconfiguring the architectural linkages between these components. Findings also show that components of knowledge have been acquired by increasing R&D investment, by

hiring new scientists embodying knowledge of innovative R&D and collaborating with Indian as well as overseas research institutes and universities.

Ida (2015) conducted a study to identify the bilateral effects of the same type of explorative capabilities research and development and export. The sample comprises world leading companies among them Pfizer, one of the world's biggest pharmaceutical companies. The results show that explorative capabilities research and development and export have positive effect on company's performance and that the bilateral effects of research and development are mild-positive.

Ngari (2016) conducted a study and titled it; intellectual capital and business performance of pharmaceutical firms in Kenya. The study revealed a changing model of pharmaceutical innovation in the country where in-house research and development has given way to the process of intellectual capital acquisition. However, this process is far from adequate; while the rights to a compound are acquired the associated human capital is often overlooked. The innovative knowledge within internal and external collaborations constitutes an integral aspect of the human capital within the organization. Capturing and encouraging this knowledge of collaboration through social Knowledge Management tools such as discussion forums, Web Blogs and Wikis would thus appear to be a prudent strategy.

Conceptual Framework

The conceptual framework is graphical representation that shows the interaction between the independent and the dependent variables. This is shown in Figure 1

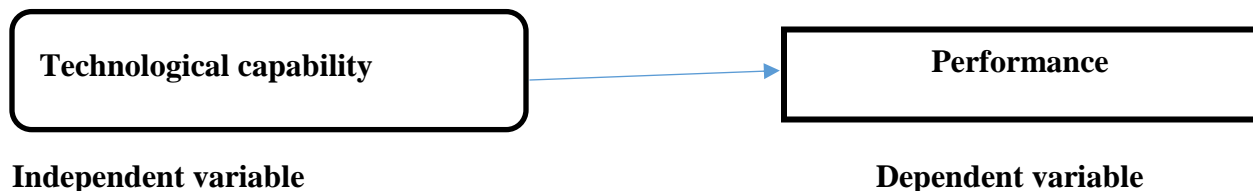


Figure 1: Conceptual framework

Technological capability is linked to firm knowledge. Reichert and Zawislak (2014) define technological capability as the firm's ability, based on its accrued knowledge, to perform a set of activities, which results in new knowledge development to achieve positive economic results. In a world where informatics is prevalent, concerns are increasingly focused on smart filtering out most of the inaccurate information in the technological field. Arnold and Thuriaux (2013) argue that data cannot be manipulated or interpreted without being capable of understanding it and acting on it. Results from a study by Madani, et al (2014) showed that the national technological and scientific environment, business environment, infrastructure and legal requirements, and international collaboration were the most important factors affecting the technological capabilities of Iran's pharmaceutical industry.

Organizations do not always behave as logically as indicated by the neoclassical model in the current society may be because they don't have sufficient skills and resources to adequately interpret incoming information. For instance, firms may take quite some time to discover extra strategies in technology to remain competitive advantaged on the entry of new competitors in the market. With perfect knowledge and preparation of the fluctuations in the market, a firm is technologically advantaged to remain competitive despite the possible competition in the market (Gellynck et al., 2012)

With organization size, the degree to which businesses actually possess such capacities tends to increase. This seems to be mainly due to the fact that increasing size increases the division of labor, allowing the company to build and commit the skills needed for the various dimensions of technological capacity. Small, technology-based companies are the biggest institutional exception: they happen to have high networking skills in information and technology, but they are not always good at technical skills. Since firms vary in size and capital, the small-scale firms often have underdeveloped business skills which make it difficult for them to do the kind of work that is usually associated with the creation of a wide-company policy. Complex research and development in pharmacy field cases is often important to give a financial case. Technological potential risks can be difficult to measure and justify (Waldman & Jensen, 2016). Therefore, they seem to be incapable to meet the competition standard consistently which makes the firms to remain technologically incapable due to limitation of resources.

Skills, knowledge and experience are required to operate existing systems and to generate technical change. Technological capability as a continuous process is to absorb and create technological knowledge from the interaction with the environment. Firms need to accumulate resources and competences, which allow them to have a more developed technological capability than their competitors. In that sense, technological capability relates to absorption and transformation of a technology as a way of reaching higher levels of technical-economic efficiency in the pharmaceutical industry. With the rise of information technology and the consequent globalization of markets, companies seek competitiveness through technological and organizational innovations (Reichert & Zawislak, 2014).

According to Song et al. (2015), to enhance innovation, an organization must invest well in the development of technological capabilities that provide the skills and abilities to unleash and employ different kinds of resources and techniques. In addition, firms can no longer rely their business merely on domestic market. They need to seek opportunity and compete in the global market place. In order to compete in the global competition, being innovative is paramount. Other than enjoying lower cost and increasing productivity innovative firms are capable of introducing or improving products or processes; define and redefined the firm or product positioning in a new market place (Alsaaty, 2011).

Research in developing countries is mainly focused on the issue of the long-term process of technological capability accumulation in industry. Technological learning involves processes by which firms build up, accumulate and sustain their technological capability. The drug discovery pharmaceutical industry offers a case in which numerous firms have pursued a strategy of adopting a new technological trajectory by transforming existing technological identity and capabilities. In today's world, advancement in ICT capability is used as a strategy to advance the plans of any organization. Information technology has revolved on how best to communicate market, advertise and distribute products from the point of manufacturing to distribution to the point where clients prefer it. Information technology capability involves learning to make the most of digital technologies available to them, adapting to new ways of doing things as technologies evolve and limiting risks in a digital environment to themselves and others (Gellynck et al., 2012).

To participate in a knowledge-based economy and be empowered both now and in the future within a technologically sophisticated society, customers need the knowledge, skills and trust to make information technology work for them at workplaces, at home and in their communities. Information and communication technologies are fast and automated, interactive and multimodal,

supporting the rapid communication and representation of knowledge to many audiences and their adaptation in various contexts (Ndiege, Herselman & Flowerday, 2014). According to Ndiege et al (2014), worldwide technological capabilities in bio pharmaceuticals include developments in accordance with the molecular biology revolution, governmental policies, and the modern international environment derived from laws and regulations. Technological capability has been chosen as a variable in this study because it is a big contributor in the performance of the pharmaceutical industry. In addition, few studies have looked into the role of technological capability in the performance of the Kenyan pharmaceutical industry

METHODOLOGY

This study adopted a positivist paradigm in trying to determine the factors that determine the sales performance of medical representatives in pharmaceutical companies. Further, descriptive cross sectional research design was employed. The study unit of analysis is the pharmaceutical companies that are operating in Kenya. The target population for this study comprised of the 415 pharmaceutical companies that are operating in Kenya, which were divided into manufacturers and distributors. The researcher interviewed the CEOs and general managers of the respective companies as they had the rightful information of the companies needed in this study. The study adopted stratified random sampling as the population was big. The stratified random method was used to calculate the sample of pharmaceuticals to be grouped into either manufacturing or distributing companies. A sample of 103 firms was considered in this study.

The study used the two basic data collection methods which is primary and secondary data. The researcher got permit from NACOSTI to collect data. The questionnaires were self-administered to the respondents across the 103 pharmaceutical companies in Kenya. The researcher used the help of four research assistants, who were trained before the data collection process commenced. The collected primary data from the field was compiled, sorted, edited and coded and entered in the Statistical Package for Social Sciences (SPSS) Version 24.0) computer program for further analysis. The study computed descriptive statistics: mean, frequencies, percentages and frequency distribution to help in data analysis. Regression analysis was used to test the relationship between the study variables.

FINDINGS AND DISCUSSIONS

Response Rate

A total of 103 questionnaires were issued to the respondents and a total of 93 questionnaires were recollected for analysis. This makes a response rate of 90% which was considered adequate for analysis.

Table 1: Response rate

Questionnaires	Number	Percentage
Duly filled and returned	93	90%
Uncollected/ unfilled	10	10%
Total	103	100%

Descriptive Statistics

The research study aimed at assessing the resultant impact of technological capability on firm performance. The elements addressed in the study were; well-informed workforce, well-developed R&D team, budget allocation, partnerships and patents with research institutions, products design upgrade, adjustment to changes in production, innovation effective strategies, resources of technology and product performance feature upgrade. The rates of the measures were assessed on the practice of the measures.

Table 2: Technological capability

	No extent	Little extent	Moderate extent	Great extent	Very great extent	Mean	Std Dev
The organization workforce is well informed of the technological improvements in pharmaceutical industry.	0.0%	0.0%	0.0%	7.5%	92.5%	4.9	0.27
The organization has a well-developed R&D team as department in the organization	8.6%	4.3%	17.2%	44.1%	25.8%	3.7	1.15
Our budget allocation to the R&D development has been increasing overtime	6.5%	9.7%	15.1%	48.4%	20.4%	3.7	1.11
We have been extending various partnerships and patents with research institutions to develop new technologies	6.5%	4.3%	14.0%	43.0%	32.3%	3.9	1.1
The organization undertakes conscious products design upgrade	7.5%	9.7%	9.7%	44.1%	29.0%	3.8	1.19
The organization is able to adjust to changes in production processes	1.1%	8.6%	4.3%	39.8%	46.2%	4.2	0.95
The organization has implemented innovation effective strategies	1.1%	4.3%	9.7%	30.1%	54.8%	4.3	0.9
Technology available in the organization enhancement has improved the processing, productivity and realization of the firms' vision and objectives through adjustment with the process changes.	4.3%	6.5%	14.0%	46.2%	29.0%	3.9	1.04

Resources of technology available have given the expected output in productivity of the firm	9.7%	8.6%	11.8%	37.6%	32.3%	3.7	1.27
The firm is able to bring up product performance feature upgrade	7.5%	5.4%	12.9%	45.2%	29.0%	3.8	1.14

The study evaluated the impact of technological capability on firm performance. From table 2, the results showed that, 92% of the respondents indicated that the organization workforce is well informed of the technological improvements in pharmaceutical industry to a great extent in their firm, and 8% of the respondents stated to a moderate extent. The mean of the response was 4.9 while the standard deviation was 0.27. The results showed that, 70% of the respondents indicated that the organization workforce has a well-developed R&D team as department in the organization to a great extent, 17% of the respondents stated to a moderate extent while 13% of the respondents stated to a low extent. The mean of the response was 3.7 while the standard deviation was 1.15. Results illustrated that, 69% of the respondents to a high extent stated that their budget allocation to the R&D team development has been increasing overtime in their pharmaceutical, 15% of the respondents stated to a moderate extent while 16% of the respondents stated to a low extent. The mean of the responses was 3.7 and the standard deviation was 1.11.

It was found that 75% of the respondents stated that their firm had been extending various partnerships and patents with research institutions to a great extent to develop new technologies, 14% of the respondents stated that the statement applied moderately to their firm while 11% of the respondents stated to a low extent. The mean of the responses was 3.9 and the standard deviation was 1.1. 73% of the respondents stated that the organization undertakes conscious products design upgrade to a high extent in their firm, 10% of the respondents stated to a moderate extent while 17% of the respondents stated to a low extent. The mean of the responses was 3.8 and the standard deviation was 1.19.

Findings showed that 86% of the respondents indicated that their organization is able to adjust to changes in production processes to a higher extent, 4% of the respondents stated to a moderate extent, and 10% of the respondents stated to a low extent. The mean of the responses was 4.2 and the standard deviation was 0.95. The results showed that 85% of the respondents stated that the organization has implemented innovation effective strategies to a great extent in their firm, 10% of the respondents stated that this statement applied moderately to their firm while 5% stated to a low extent to their firm. The mean of the responses was 4.3 and the standard deviation was 0.9.

Results showed that 75% of the respondents stated that technology available in their organization enhancement has improved the processing, productivity and realization of the firms' vision and objectives through adjustment with the process changes to a high extent, 14% of the respondents stated that this statement moderately applied to their firm, and 11% of the respondents stated to a low extent. The mean of the responses was 3.9 and the standard deviation was 1.04.

About 70% of the respondents stated that resources of technology available have given the expected output in productivity of the firm to a great extent, 12% of the respondents indicated to a moderate extent while 18% of the respondents stated to a low extent. The mean of the responses was 3.7 and the standard deviation was 1.27. A total of 74% of the respondents stated that their

firm is able to bring up product performance feature upgrade to a great extent, 13% of the respondents stated to a moderate extent. 13% of the respondents stated to a low extent. The mean of the responses was 4.1 and the standard deviation was 0.93. On a similar note, Reichert & Zawislak, (2014) noted that with the rise of information technology and the consequent globalization of markets, skills, knowledge and experience by the organization workforce are required to operate existing systems and to generate technical change. Vorhies, Morgan & Autry, (2009) noted that corporate marketing capability is a key support for launch of new product by R&D team. With a strong marketing capability and a well-developed R&D team, the organization will promote new product in the sales. Vorhies, Morgan & Autry, (2009) noted that in launching a new product, corporate marketing ability is considered to be key and for this to be achieved, budget should be allocated to the R&D team to promote successful launching of the new products. Grootendorst, (2009) noted that in a goal to support pharmaceutical innovation, system of pharmaceutical patents and partnerships has proved to be effective and outlines the various mechanisms that may spur pharmaceutical innovation more effectively.

Correlation Analysis

A correlation is used to estimate the strength of the linear relationship between two variables representing how closely two variables co-vary ranging from -1 termed as perfect negative correlation through 0 or no correlation to +1 termed as perfect positive correlation Jan et al., (2015). Correlation is measured by correlation coefficient that represents the strength of the putative linear association between the variables in question (Joseph & Alan, 2012). A correlation coefficient of zero is an indicator non-existent of linear relationship. A correlation coefficient of -1 or +1 indicates a perfect linear relationship.

Table 3: Correlation analysis

		Performance
Technological Capabilities	Pearson Correlation	.685**
	Sig. (2-tailed)	0.000

From Table 3, the findings revealed that there was a positive and significant association between technological capability and firm performance ($r = 0.685$, $p = 0.000$). This implies that technological capability factors have contributed to the resultant firm performance. This correlation coefficient value was between 0.6 and 0.7 indicating a strong positive correlation as a factor of firm performance. A 2-tailed test at 95% level of confidence had a probability value of less than 0.05 which implied that there was a significant correlation between technological capability and firm performance in pharmaceutical companies. Similarly, Ida (2015) conducted a study to identify the bilateral effects of the same type of explorative capabilities research and development and export. The results show that explorative capabilities research and development and export have positive effect on company's performance.

Regression Analysis

Regression analysis was carried out to determine the relationship between independent and dependent variables. In the end, the extent of the relationship between independent and dependent variable was quantified. The T-test statistic and the R² Test statistic were computed to determine

the strength of the relationship. Regression analysis was done to determine the influence of Technological capability on firm performance. Results were presented in Table 4.

Table 4: Regression analysis- Technological capability

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.428 ^a	.183	.174	.549

a. Predictors: (Constant), Technological Capabilities

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	6.147	1	6.147	20.367	.000 ^b
	Residual	27.466	91	.302		
	Total	33.613	92			

a. Dependent Variable: Performance

a. Predictors: (Constant), Technological Capabilities

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error			
1	(Constant)	1.672	.533		3.135	.002
	Technological Capabilities	.603	.134	.428	4.513	.000

a. Dependent Variable: Performance

The results in Table 4 presented the fitness of model of regression model used in explaining the study phenomena. Technological capability factor was found to be satisfactory in contribution as a factor to firm performance. This was supported by coefficient of determination i.e. the R² of 18.3%. This shows that 18.3% of the variation in technological capability affects firm performance. The results meant that the model applied to link the relationship. This also implies that 81.7% of the variation in the dependent variable is attributed to other variables not captured in the model

From Table 4, the results on analysis of variance (ANOVA) were illustrated. The findings revealed that the model was statistically significant. This was supported by an F-statistic of 20.367 and a p-value of 0.000 which is less than 0.05 (p<0.05) significance level. The findings implied that technological capability is a good predictor of firm performance. Similarly, Ida (2015) conducted a study to identify the bilateral effects of the same type of explorative capabilities research and development and export. The results show that explorative capabilities research and development and export have positive effect on company's performance.

Regression of coefficients results in Table 4 revealed technological capability and firm performance are positively and significantly related ($\beta = 0.603$, $p = 0.000$). This implies that a unit increase in technological capability would lead to increase in firm performance by 0.603.

The regression model for this coefficient would be;

$$Y = \beta_0 + \beta_1 X$$

Where Y = firm performance

$$\beta_0 = 1.672$$

$$\beta_1 = 0.603$$

X = technological capability

$$Y = 1.672 + 0.603X$$

CONCLUSIONS AND RECCOMENDATIONS

Conclusion

The objective of the study was to determine the influence of technological capability on firm performance on pharmaceutical companies in Kenya. The correlation analysis revealed that there was a positive and significant association between technological capability and firm performance ($r = 0.685$, $p = 0.000$). This implies that technological capability factors have contributed to the resultant firm performance. This correlation coefficient value was between 0.6 and 0.7 indicating a strong positive correlation as a factor of firm competitiveness. A 2-tailed test at 95% level of confidence had a probability value of less than 0.05 which implied that there was a significant correlation between technological capability and firm performance in pharmaceutical companies. Regression of coefficients results revealed that technological capability and firm performance are positively and significantly related ($\beta = 0.603$, $p = 0.000$). This implies that a unit increase in technological capability would lead to increase in firm performance by 0.603.

The findings from the research revealed that most of the firms have a well-informed workforce on the technological improvements in pharmaceutical industry. Also, most firms have a well-developed R&D team and budget allocation to the team has been increasing overtime. In the aim of developing new technologies, firms have been extending various partnerships and patents with research institutions. The new technology has enabled firms to undertake conscious products design upgrade and adjust to changes in production processes. Also, the firms have been able to implement innovative effective strategies and have improved the processing, productivity and realization of the firms' vision and objectives through adjustment with the process changes. As a result, resources of the technology have given the expected output in productivity of the firms.

Technological capability has been employed by pharmaceutical companies in Kenya by embracing the generation of knowledge and learning. With perfect knowledge and preparation of the fluctuations in the market, a firm is technologically advantaged to remain competitive in the market. The set of activities carried out by the firms which result in new knowledge development enables them to achieve positive economic results. It is concluded that technological capability has a positive and significant relationship to firm performance. Most pharmaceutical firms have employed the technological capabilities which include having a well-informed workforce, allocating budget to R&D team, upgrading their products design and creating partnerships and

patents with research institutions. These strategies have enabled firms in Kenya improve their market performance in the modern world.

Recommendations

In the modern business world, technological capability of a firm stands to be one of the main determinants of how well the organization performs in terms of efficiency and effectiveness. It is therefore recommended that the management of pharmaceutical companies embrace information technology by bringing modern and automated means of production as well as information sharing platforms that create the uniqueness, efficiency and effectiveness of their firms.

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