

**TECHNOLOGY ACQUISITION STRATEGIES AND THE PERFORMANCE OF  
COMPANIES WHO IMPORT AND DISTRIBUTE PHARMACEUTICAL  
PRODUCTS IN KENYA**

**ANNASTACIA KALONDU KIMWELE**

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## DECLARATION

This research project is my original work and has not been presented for the award of degree in any other university or institution for any other purpose.

Signature ..... Date .....

**Annastacia Kalondu Kimwele**

**D61/75325/2012**

This research project has been submitted for examination with my approval as university supervisor.

Signature ..... Date .....

**Dr. Jeremiah Kagwe**

**School of Business**

**University of Nairobi**

## **DEDICATION**

I dedicate this project to my dear husband Julius Muthama and my children Mercy Wayua and Daniel Nzonzi for their support during the entire period I was working on this project. To my mum, Sabina Kimwele who has been a pillar in my life and my boss who encouraged me to further my studies.

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## ABSTRACT

The world is currently experiencing an information technology revolution that has drastically changed many aspects of the human life, from education, industry, economy and politics to entertainment. Technology has become very vital to all organizations that intend to remain competitive in the market. Therefore, organizations have adopted the strategies to embark on performance that will provide a source of competitive advantage and embrace the usage of technology. Technology acquisitions are acquisitions that provide technological inputs to the acquiring firm. It is an important process, especially for companies, due to its impact on performance and overall contribution to the goals of the company. The objective of the study was to determine the effect of technology acquisition strategies on the performance of pharmaceutical companies importing and distributing products in Kenya. The study used cross-sectional descriptive survey. The population of the study comprised of all the fifty licensed pharmaceutical companies in Kenya. The study used primary data that were collected through self-administered questionnaires. The data was analyzed by the use of descriptive statistics. The regression analysis was used to assess the relationship between technology acquisition strategies and performance. The adoption and usage of the technology acquisition strategies by the firms was determined by several factors that include firm strategy, market trends, technological capability and technological relevance. Other factors were found to be firm finances and human resources, absorptive capacity of the company, firm's customers and competitors and technology supplies. In-house development strategy enabled the companies utilize the best technology in the market while at the same time enriching their technology which results in flexible decision making. The companies were also able to utilize the resources that would have been used in technology innovation in core technological competencies. Technological purchasing enabled the companies to utilize the best technology in the market while at the same time enriching their technology which results in flexible decision making. The companies were also able to utilize the resources that would have been used in technology innovation in core technological competencies. Collaborative development enabled the firms to benefit from research complementarities through involvement in multiple technological trajectories, research directions that cannot be developed simultaneously (at sufficient speed) in-house and external skills in the exploitation of in-house research activities. Technology acquisition strategies were found to have enabled the firms increase their competitive position in the industry, increase sales, efficiency in distribution of products, market share and reduced costs. The technologies further enhance customer purchase of products creating customer satisfaction and loyalty. The regression analysis established that there was a positive relationship between pharmaceutical firms' performance and strategies used by the firms to acquire technology they use. The study recommends that firms need to make great efforts towards internal research and development and to enhance their internal knowledge base to maintain technological competence and enjoy long-term competitive advantage.



## **CHAPTER ONE: INTRODUCTION**

### **1.1 Background of the Study**

The world is currently experiencing an information technology revolution that has drastically changed many aspects of the human life, from education, industry, economy and politics to entertainment. Ajayi (2002) pointed out that technological change has been a major hallmark of economic development in recent years. An interesting and vital part of that technical change in business has been changing rapidly as the global environment becomes highly competitive and innovative. Technology has become very vital to all organizations that intend to remain competitive in the market. Therefore, organizations have adopted the strategies to embark on performance that will provide a source of competitive advantage and embrace the usage of technology (Kevin, 2006). Additionally, technology strategy creates a wide array of new business opportunities for organization like improves efficiency and cost effectiveness, high quality products and services to their customers.

The study is based on Resource Based Theory which argues that any firm is essentially a pool of resources and capabilities which determine the strategy and performance of the firm; and if all firms in the market have the same pool of resources and capabilities. All firms will create the same value and thus no competitive advantage is available in the industry (Barney, 1991). The basis of the resource-based view is that successful firms will find their future competitiveness on the development of distinctive and unique capabilities, which may often be implicit or intangible in nature. It argues that superior performance rests on resources and capabilities that are valuable and rare, that strategies based on these resources are costly to imitate and finally that procedures and policies are organized to exploit the resources and capabilities. Thus, the essence of strategy is to enable the organization utilize the unique resources and capabilities wisely. Furthermore, the value creating potential of strategy, that is the firm s ability to establish and sustain a profitable market position, critically depends on the rent generating capacity of its underlying resources and capabilities.

In Kenya, pharmaceutical companies have adopted technology strategy because it is becoming more and more relevant, mainly as a result of intense international competition, fragmented and demanding markets, and diverse and rapidly changing technologies. The technology will increase in the capacity to produce new goods and services (product innovations). Similarly, technologies strategies allow staff to effectively communicate and collaborate across wider geographic areas will encourage strategies for less centralized management, and more flexible external relation (Hamilton, 2010). Consequently, technology strategies have a significant and positive effect on a firm's probability to introduce new products and reduction in cost, increasing business opportunities, reducing lead time and providing a more personalized service to the consumers.

### **1.1.1 Technology Acquisition Strategies**

An organizational strategy has received different definitions. Pierce and Robinson (2007) defined strategy as the direction and scope of an organization with the aim of achieving competitiveness through the use of its resources. On his part, Rhee (2010) defined strategy as the process of managing actions planned for running the business and conducting operations. On the other hand, Mintzberg (1998) defined strategy as a long term plan of action aimed at achieving a particular organization. Therefore, a firm's strategy should integrate its capability in a manner designed to make use of corporate knowledge, skills and resources to better meet their customers' needs through added value services to their products.

Russell and Hoag (2004) stated that technology is the ability to create a reproducible way to improve products, processes and service. The technology is conceived as firm-specific information concerning the characteristics and performance properties of the production process and product design. Similarly, Mascus (2003) defined technology as the information necessary to achieve a certain production outcome from particular processing selected inputs which include production processes, intra-firm organizational structures and management techniques.

The technology acquisition process adopted by a company is dependent on the constraints imposing on the firm; such as cost, time and risk, the firm's absorptive capacity and the level of independence that the firm requires. As such, technology acquisition was recognized as being perilous, difficult and a strategic process (Daim & Kocaoglu, 2008). Technology acquisition methods must therefore be well-suited to the company's technology strategy and should be linked to the aspirations of the firm. Technology purchasing is broadly defined as acquiring technologies by contracts, licensing or simply purchasing from a provider. This mode neither utilizes internal capabilities nor requires any technical collaboration (Cho & Pyung-II, 2010). Collaborative development can be defined as the complimenting of internal resources in the innovation process, enhancing both the innovation input and output measured by the realization of innovations (Becker & Dietz, 2009).

### **1.1.2 Organizational Performance**

Organizational performance is described as the extent to which the organization is able to meet the needs of its stakeholders and its own needs for survival (Griffin, 2003). Organizational performance is the valued productive output of a system in the form of goods or services. The chief goal of a business is to achieve financial or maximization of wealth for the shareholders. Firm performance can be defined in financial and non-financial terms. This indicates that organizational performance is subdivided into three categories: financial performance, internal non-financial performance and external non-financial performance (Becker & Gerhart, 2008). Private sector organizations strive for good financial results whereas public organizations are aimed at non-financial aims like delivering good public services to citizens. To achieve performance through employees, the organization must consider them as assets and must be treated with attention so that the employees become productive (Ravenscraft & Scherer, 2007).

The performance of any business organization is affected by the strategies that the organization has chosen. Organization performance requires selection and measuring key variables that can allow the organization to detect and monitor its competitive position in the business. Thompson (2007) notes that using financial measures alone overlooks the

fact that what enables a company achieve or deliver better financial results from its operations is the achievement of strategic objectives that improve its competitiveness and market strength. Out of all these components, only market share can be measured in quantitative terms, whereas all the elements of financial performance can easily be measured quantitatively (Cole, 2005).

### **1.1.3 The Pharmaceutical Industry in Kenya**

The pharmaceutical industry in Kenya consists of three segments namely the manufacturers, distributors and retailers. All these play a major role in supporting the country's health sector. The pharmaceutical sector includes local manufacturing companies and large Multi-National Corporations, subsidiaries or joint ventures. Most are located within Nairobi and its environs. Pharmaceutical products in Kenya are channeled through pharmacies, chemists, health facilities and specialized shops. There are about 700 registered wholesale and 1,300 retail dealers in Kenya, manned by registered pharmacists and pharmaceutical technologists (Pharmacy & Poisons Board, 2016).

The drugs on sale in Kenya are sold according to the outlet categorization, which can be described as free sales, over the counter and prescription only. The market for pharmaceutical products in Kenya is estimated at KShs 8 billion per annum. The government, through Kenya Medical Supplies Agency (KEMSA) is the largest purchaser of drugs manufactured both locally and imported, in the country. It buys about 30% of the drugs in the Kenyan market through an open-tender system and distributes them to government medical institutions.

### **1.1.4 Companies Importing and Distributing Pharmaceutical Products in Kenya**

The pharmaceutical companies are mainly known for the development of products, and markets drugs used as medications. The pharmaceutical industry in Kenya consists of three segments namely the manufacturers, distributors and retailers. The country has 30 licensed manufacturing and large Multi-National Corporations (MNCs), subsidiaries or joint ventures. The pharmaceutical industry is interconnected with other sectors and its significant investments in technology, research, and development mean that the

industry's gains can have an outsized effect on the economy as a whole. The pharmaceutical industry in Kenya shows considerable strengths and has significant opportunities for growth and development.

The pharmaceutical industry is involved in medicines packages, repacking formulated drugs and processing bulk drugs into doses using predominantly imported active ingredients and excipients. The number of companies engaged in manufacturing and distribution of pharmaceutical products in Kenya continue to expand, driven by the Government's efforts to promote local and foreign investment in the sector. Pharmaceutical products in Kenya are channeled through pharmacies, chemists, health facilities and specialized shops. Kenya's pharmaceutical export has grown by 96 per cent between 2008 and 2012, corresponding to a Compound Average Growth Rate (CAGR) of 18.3 per cent over this period. The Kenyan export of pharmaceutical products are destined for the United Republic of Tanzania and Uganda and the expanding market in these countries may be attributed to the growth in demand in pharmaceutical markets in these destination countries (Ongubo, 2013).

## **1.2 Research Problem**

In an era of rapidly changing technology and strong global competition, companies acquire new technologies in order to meet the requirements of the market and gain a competitive advantage. Technology acquisitions are acquisitions that provide technological inputs to the acquiring firm (Ahuja & Katila, 2011). It is an important process, especially for companies, due to its impact on performance and overall contribution to the goals of the company. Faced with accelerating changes of the technological environments and increasing international competition, firms need to possess the ability to timely update their technological knowledgebase in order to survive (Daim & Kocaoglu, 2008).

Globalization of companies in which pharmaceutical companies are a major part of is continually growing in response to the changing environment of international trade. The pharmaceutical industry in Kenya is highly globalized, with over half the sales of the fifty

largest drug companies made outside their home country. The role of the pharmaceutical sector in Vision 2030 is to create employment and wealth. The configuration of competitive forces such as intensity of competition, new entrants, substitute products and supplier and buyer power have transformed the importation and distribution of pharmaceutical products in Kenya, creating the need for firms to change their competitive positions and adopt technology acquisition as a strategy. As a consequence of technology acquisitions, a company can manage to reach more customers across the globe and add additional range of products and services depending on the customer's needs.

Several studies have been undertaken both internationally and locally on the need of the adoption of technology acquisition strategies. Lanctot and Teege (2000) researched on the impacts of external technology acquisition strategy and internal research and development on the subsequent performance of firms. Ahuja and Katila (2006) in their study found that business firms can enhance their innovation performance by using mergers and acquisition strategies to expand their technical knowledge. In addition for fully external acquisition activities, acquisition with a type of partnership is a common acquisition method. Partnering with other firms which have technical knowledge expertise may allow organizations to leverage their skills and increase their competitiveness. Venkatraman & Ramanujam (2010) propose that a firm using technology alliances to learn from its partners can expand its existing technological knowledge base and achieve higher innovative output.

Locally, Ouma (2011) researched on the influence of information and communication technology alignment to business strategy among commercial banks in Kenya and established that the proliferation of new information and communication technologies within the financial industry has significantly influenced the way commercial banks deliver services to their customers. Kanuna (2013) study on the effects of information communication technology on financial performance of Document Handling Limited established that adoption of Information Technology enhanced the firm communication with its customers as well as meeting promptly the customer's orders. Muthoni (2013), researched on the influence of brand extension strategies on the performance of

pharmaceutical firm in Kenya and found that local pharmaceutical firms use brand extension strategy to build brand knowledge and define the boundaries of the domain in which it competes in, define customer trend and need; and increase brand value. As seen above, there has been a limited study on the role of technology acquisition strategies on the performance of a firm. This therefore leads to the following research question; what is the effect of technology acquisition strategies on the performance of pharmaceutical companies importing and distributing products in Kenya?

### **1.3 Research Objectives**

The objectives of the study were;

- i. To identify technology acquisition strategies pursued by companies importing pharmaceutical products in Kenya.
- ii. To determine the effect of technology acquisition strategies on the performance of companies importing pharmaceutical products in Kenya.

### **1.4 Value of the Study**

The project theoretically will provide a more in-depth understanding of the link between technology acquisition strategies and performance of pharmaceutical companies. The findings of the study will assist managers in designing appropriate strategy that takes into consideration the performance of the organization in the competitive environment.

The understanding of the technology strategy adopted by pharmaceutical companies will help policy makers, Government, Regulatory bodies and other stakeholders to design targeted policies and programs that will actively stimulate the growth and sustainability of the pharmaceutical companies in the country, as well as helping those policy makers to support, encourage, and promote the establishment of appropriate policies to guide the firms. The study findings will benefit management and staff of pharmaceutical companies who will gain insight into how their institutions can effectively manage their technology strategy. This will benefit with source of material in developing and harnessing their technology strategies in the present evolving and dynamic business environment.

The government and regulators of the industry will obtain useful information to formulate positive policies that guide and encourage pharmaceutical companies in Kenya by acknowledging the adoption of technology strategies to other organization for better performance. This study will offer an understanding on the importance of technology strategy to competitive advantage to the company. The study provides the background information to other researchers and scholars who may want to carry out further research in this area. It is expected that the study adds knowledge generated will enable other researchers to improve and develop a better understanding of technology strategies in the pharmaceutical industry.



## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter is structured based on the research objectives. It reviewed the relevant literature available that focuses on the theoretical framework, technology strategies and the effect of technology strategies on performance.

### **2.2 Theoretical Foundation**

This study will discuss on resource based view theory and technology acceptance model theory and how they relate to technology strategies and performance.

#### **2.2.1 The Resource Based View**

The Resource-Based View stipulates that the fundamental sources and drivers to firms' competitive advantage and superior performance are mainly associated with the attributes of their resources and capabilities which are valuable and costly-to-copy (Bowman & Ambrosini, 2009). Building on the assumptions that strategic resources are heterogeneously distributed across firms and that these differences are stable overtime. The resource-based theory argues that any firm is essentially a pool of resources and capabilities which determine the strategy and performance of the firm; and if all firms in the market have the same pool of resources and capabilities, all firms will create the same value and thus no competitive advantage is available in the industry (Peteraf, 2009).

The Resource Based Theory suggests that competitive advantage and performance results are a consequence of firm-specific resources and capabilities that are costly to copy by other competitors (Boxall & Steenveld, 2009). These resources and capabilities can be important factors of sustainable competitive advantage and superior firm performance if they possess certain special characteristics. They should be valuable, increasing efficiency and effectiveness, rare, imperfectly imitable and non-substitutable. According to resource-based theory, organizations wish to maintain a distinctive product (competitive advantage) and will plug gaps in resources and capabilities in the most cost-effective manner. This theory emphasizes that resources internal to the firm are the

principal driver of a firm's profitability and strategic advantage. Every firm plans and implements various strategies in order to create competitive advantages so that they could outperform their competitors and earn a higher rate of profits in their industry (Besanko, 2010).

### **2.2.2 Technology Acceptance Theory**

Technology Acceptance Theory (TAT) is one of the most successful measurements for computer usage effectively among practitioners and academics (Davis, 2009). TAT is consistent with (Rogers, 2003) theory on diffusion of innovation where technology adoption is a function of a variety of factors including; relative advantage and ease of use. He noted that the future technology acceptance research must address how other variables affect usefulness, ease of use and user acceptance. Therefore, perceived ease of use and perceived usefulness may not fully explain behavioral intention towards the use of mobile services. Another key limitation of TAT is that while it provides a valuable insight into user's acceptance and use of technology, it focuses only on the determinants of intention and does not tell us how such perceptions are formed or how they can be manipulated to foster user's acceptance and increased usage.

The basic connection between TRA and TAT is Behavioral Intention (BI). They both postulate that user behavior in information systems is determined by behavioral intent (Knight, 2007). However they differ in that where TRA states a user's behavioral intention is determined by their Attitude (A) and Subjective Norms (SN) for instance, what they perceive is the behaviour expected of them by those around them, TAT states a user's behavioral intention is determined by their attitude and Perceived Usefulness of the chosen behavior. The Technology Acceptance Theory tries to explain the adoption process and underlying influencing factors in technology acceptance. The theory of acceptance and use of technology aims to explain user intentions to use an information system and subsequent usage behavior. The theory also holds that four key constructs (performance expectancy, effort expectancy, social influence, and facilitating conditions) are direct determinants of usage intention and behavior (Venkatesh, 2010).

## **2.3 Factors Affecting Technology Acquisition Strategies**

Technology developments have enormous implications on the operation, structure and strategy of organizations. Evans and Wurster (2009) argued that competitiveness of future economies relies on both the development and application of these technologies. The literature provides an elaborate insight to a vast array of technology acquisition channels used by firms. Among these lie; sponsoring university research, external research and development centers, consultants, joint ventures, licensing agreements, in-house technology development, purchase through vendors/suppliers, purchase of existing technology, and technical journals.

The key factors influencing technology acquisition in high-tech firms are; firm strategy, market trends, technological capability and technological relevance (Cohen & Levinthal, 2010). These are the primary factors, which in turn are affected by factors internal to the firm, such as the firm's finances and human resources, and the intangible factors relating to the uncertainty associated with the acquired technology, and the experience level and perceptions of the firm's employees. In addition, external factors such as the firm's customers and competitors, the technology suppliers and overall market activity, also indirectly affect the four, primary factors influencing technology acquisition.

### **2.3.1 Firm Strategy**

One of the most important strategic decisions management faces in today's globally competitive environment surrounds the issues of technology acquisition or development. In the past, firms typically relied on internal development and the technological capabilities of the firm. In recent years however, external sources of technology have been gaining attention worldwide (Hagedoorn, 2009). For many firms, a feasible technology strategy defining the need for external vs. internal technology development, and identifying when to alternate between the two, can be of vital strategic importance (Jones, Lanctot & Teegen, 2011).

Conversely, acquiring technology from external sources could assist with rapid development and implementation of commercial technology and products, while

simultaneously accessing state of the art technology. Nonetheless, it must be noted that external technology acquisition can suppress the need to develop and consequently advance the internal technological capabilities of the firm.

Technology management requires a thorough understanding of the environment the firm operates in and the internal conditions of the firm, which in turn will enable it to rapidly adapt itself to changes in the business/market landscape (Haspeslagh & Jemison, 2011). Firm strategy therefore, is a primary factor influencing the decisions around technology acquisition. It is clear that firms that recognize this link and align their technology sourcing activity with the strategic direction of the organization, will be better able to source technology that is not only capable of meeting the current needs of the firm, but also has the potential to provide for future requirements.

### **2.3.2 Market Trends**

Product or process technologies currently adopted by the firm often dictate future choice (Durani, Forbes, Broadfoot & Carrie, 2008). The failure of the firm to retain market leadership can be attributed to failure to identify and conquer market trends. As stated above, technology acquisition should be viewed as a strategic process. Success is dependent on firms understanding the markets they operate in, and positioning themselves; through appropriate technology acquisition.

Market trends can have a significant impact on the mode of technology acquisition. For example, a firm operating in a rapidly developing market is likely to face tight time pressure, to meet the demands of the market. In such instances, the firm is likely to turn to external sources for the required technology, because unless the firm has superior development capability compared to its competitors, internal development could cost the firm time and effort, which would be better spent implementing the technology. The technology could be sourced even faster if it were acquired from another firm that already possesses the technology (Haag & Stephen, 2010). In the high technology industry, one of the key factors to gain competitive advantage is the firm's ability to establish market-place requirements and consequently identify technology solutions to meet those needs

(Durani *et al.*, 2008). An awareness of the key trends in the market place; the requirements of target customers, the actions of competitors, and the product portfolio of technology suppliers, can make a significant difference in the outcome of the technology acquisition process adopted by the firm.

### **2.3.3 Technology Capability**

Technological capability is a further factor found to affect technology acquisition. Michell, Holton and Lee (2011) describe technological capability as a set of pieces of knowledge that includes both practical and theoretical know-how, methods, procedures, experience and physical devices and equipment. As such, technological capability represents an important source of competitive advantage and thus superior performance, in technologically competitive markets. Developing technological ability is thus crucial to a firm's sustainability and success in the environment it operates in. Technological capability not only has a direct, but also an indirect impact on business performance and new product development performance (Rao, Metts & Mong, 2003).

Firms with high technology capabilities, have more choices available to them for technology acquisitions (Hung & Tang, 2008). Haspeslagh and Jemison (2011) point out that the greater the existing skill capabilities and technological knowledge resource the firm harbors, the greater it's interest in internal development. Further, internal development also assists in achieving greater control of the firm's distribution, ensuring a viable technological capacity (Cohen & Levinthal, 2010). Firms with strong technological capacity can take advantage of their knowledge base when formulating decisions around technology acquisition. These firms are better equipped to deal with the uncertainty of new technology and have the necessary resources and experience to carry it through to successful completion. An assessment of the firms' own knowledge base and technology capability is thus necessary to aid with the decisions around technology acquisition. Further, in order to better support the technology sourcing activity, firms should invest in developing their technological capabilities and absorptive capacity.

### **2.3.4 Technological Relevance**

In the technology industry, the rate at which new products can be released is dependent on the speed of technology acquisition. This is critical to creating and sustaining a competitive advantage for the firm. The technological relevance of the newly sourced technology to the acquiring firm significantly influences the success or failure of its implementation (Hung & Tang, 2008). Certain technologies, regardless of their complexity, build on established technology, systems and assumptions currently held within the firm. In such cases, the complete transfer of the acquired technology could be minimal, and consequently easier for the firm to adopt and implement the technology.

Lin and Wu (2010) points out that technical complexity is inherent to the technology itself, and that it lies outside the realm of control of the organization. Durani *et al.*, (2008) argues that the degree of systemic shift is a factor of the firm's existing technical expertise. By understanding the entire spectrum of the technology; from cultivating an awareness of its existence, to developing an understanding of the underlying theory behind the technology; its interdependencies with other technologies and its links to future strategy, firms will be better positioned to understand and transfer the newly acquired technology.

## **2.4 Technology Acquisition Strategies**

Firms engage in the process of technology acquisition by either adopting technology developed outside the firm, or engaging in internal research and development to develop own technology. With respect to the former, firms can adopt knowledge or technology embodied in purchased technologically sophisticated plant and equipment, intermediate and final goods imports, inward foreign direct investment, expatriate personnel, licensing and franchising (Cohen & Levinthal, 2010).

### **2.4.1 In-house Development Strategy**

Innovation is a process in which organizations define problems and then actively develop new knowledge to solve these problems (Hagedoorn, 2009). Firms may enhance their understanding of existing knowledge and convert such understanding into new types of

knowledge through internal R&D activities. Moreover, internal R&D activities strengthen the interactions among individuals and organizations. Greater commitment to internal R&D leads to a greater rate of new discoveries, as well as to improvements in the flow of new scientific knowledge into firms. Furthermore, because internal knowledge bases are built through long-term R&D investments and learning-by-doing, continuous efforts for internal R&D are required for firms to build up their internal knowledge bases and reinforce long-term innovative capabilities (Hamilton, 2010). Technological development that entails well-structured problem solving is more explicit and unequivocal and likely entails more data-intensive activities, with minimal performance questions or concerns (Rhee, 2010).

Having a strong knowledge base is the key to successful technological innovation and existence of an internal knowledge base of a firm is the genesis for new technological developments; hence, it helps firms to innovate. In addition, the existing knowledgebase enhances the abilities of firms to recognize, search, and represent problems, and to assimilate and utilize new knowledge for problem solving (Cho & Pyung-II, 2010). Furthermore, because recombining internal knowledge does not require the same lengthy assimilation processes or learning periods of external knowledge, large internal knowledge bases allow firms to innovate more rapidly. Hagedoorn (2012) noted that firms engaging in internal basic research increase their technological performance, in particular when these activities are undertaken in collaboration with universities.

#### **2.4.2 Technology Purchasing Strategy**

Faced with accelerating changes of the technological environments and increasing international competition, firms need to possess the ability to timely update their technological knowledgebase in order to survive. Sourcing external knowledge broadly has a significant effect on a firm's innovation performance, because the external knowledge is used to create innovation. Therefore, if a firm adopts external technologies from various types of technology providers, the firm can greatly enrich its internal knowledge and technology base. This large base allows for a recombination of diverse knowledge and leads to innovation (Fleming & Sorenson, 2011).

Rhee (2010) noted that when firms utilize external sources, benefits will not be instantaneous as it requires time and extensive effort to understand the norms and routines of different external knowledge channels. Therefore, *ex ante*, it is difficult for managers to recognize which external source will become the most profitable. Under conditions of uncertainty, by accessing more knowledge sources, firms enhance the probability of obtaining valuable knowledge for technological advances. The same logic applies to external technology acquisition; managers do not know which external technology provider will supply the most beneficial technologies.

External technology acquisition is known to possess a variety of advantages. It allows firms to acquire the best available technology, reduce time to market, and focus their resources and capabilities on core technological competencies. Moreover, recent studies have emphasized that external sourcing is complementary to internal R&D or the existing knowledge base in developing new products and enhancing firm performance (Caloghirou, Kastelli, & Tsakanikas, 2013). Second, by outsourcing non-core technological activities, external technology acquisition allows firms to focus their resources and capabilities on developing their core technological competencies. External technology acquisition allows firms to specialize deeper in their core competences while relying on outside firms that are specialized in other fields, for complementary expertise and skills (Haspeslagh & Jemison, 2011). Third, external technology acquisition provides flexibility in strategic decision-making for technology development.

### **2.4.3 Collaborative Development Strategy**

The motive for strategic alliances is to influence economics of scale and scope through co-research and development, co-manufacturing, and co-purchasing. Through sharing complementary resources and capabilities between companies, there is an increase in productivity, market power, and learning effect. When firms utilize external technologies for innovation, there may be gaps between the internal knowledge base and the externally acquired technologies. Through internal research and development activities, firms can fill these gaps and utilize external technologies more efficiently. Empirical tests support the argument that higher levels of research and development activities improve the ability



of firms to exploit external knowledge sources (Hung and Tang, 2008). With more internally available resources, the relationship between external technology acquisition and firm performance becomes stronger (Jones *et al.*,2011).

Firms that possess prior knowledge related to the external knowledge can understand the external knowledge better and readily apply it for innovation purposes. Firms that have larger internal knowledge bases are more likely to possess prior knowledge that is related to the externally acquired technology; hence, they may have a significant advantage in utilizing the externally acquired technology in their subsequent technological innovation. Moreover, the internal knowledge base and absorptive capacity are closely linked (Cohen & Levinthal, 2010).

Haspeslagh and Jemison (2011) demonstrate that firms that leverage external technology sourcing as a complement to internal research and development investments in order to probe and access cutting-edge knowledge are most successful in their new product introductions. Moon, (2008) finds, while studying the continued survival of incumbent firms when confronted with radical technical change, that a combination of internal research and development and external technology sourcing through alliances positively reinforces firms' innovative output. In a similar fashion, Cassiman and Veugelers (2006) find that internal research and development and external knowledge acquisition are complementary innovation activities. Their findings suggest that the contribution of external technology acquisition to firm performance increases with the level of internal research and development efforts. The combination of external technology sourcing and internal research and development can allow firms to benefit from research complementarities though involvement in multiple technological trajectories, research directions that cannot be developed simultaneously (at sufficient speed) in-house, and external skills in the exploitation of in-house research activities.

## **2.5 Technology Acquisition Strategies and Organizational Performance**

Today, technology has become not only a tool to process data and record transactions, but also a competitive weapon that can change an industry's structure. Galliers (2004)

suggested that because of the rapid pace of technological advances and the effect of technology on the changing competitive environment, organizations are forced to critically evaluate their management of information and technology resources in order to achieve their strategic objectives. Won and Olafsson (2005) stated that pharmaceutical managers aim to increase productivity, reduce costs and fast deliveries. However, the cost, the distribution, and the fact that it was generally applied to only simple tasks in its early stages discouraged its application to strategic uses in areas such as enhancing the organization's position against competitors, moving into new markets, and providing managers with better information for effective decision making. The advancement in the technological field along with other advancements have enhanced the economies of technology and greatly expanded its applications.

One of the strongest evidences of the impact of technology strategy has been illustrated as coming from the firm-level analysis that is confirmed to a number of developed countries (Cohen & Levinthal, 2010). Most of these studies use a combination of growth accounting methods and econometric models to examine samples of industries and firms. For example, Gretton, (2002), studying firm-level data from the Australian Business Longitudinal Survey, found positive and significant links between the use of technology and growth in both manufacturing and service industry. Brynjolfsson and Hitt (2003), investigating US firm-level data, proved that technology has a solid impact on productivity. It is widely accepted among many authors and researchers in the organizational field that technology strategy has a significant effect on the performance of the organization's activities.

Based on resource based theory to examine how technology strategy affect firm performance, Ravichandran and Lertwongsatien (2005) posited and found that variation in firm performance is explained by the extent to which technology is used to support and enhance a firm's core competencies. They also found that an organization's ability to use technology to support its core competencies is dependent on functional capabilities, which in turn is dependent on the nature of human, technology, and relationship resources of the department. The results provide empirical support for the notion that

technology strategy has the potential to improve firm performance when its capabilities are channeled to develop distinctive firm competencies.

### 2.5.1 Summary of Empirical Studies and Research Gaps

From the literature review covered in this section, it is evident that studies have been done on the need to integrate the players in technology acquisition strategy. Specifically the studies have looked at the factors affecting technology acquisition strategy and the performance in the organization. In the past, Technology acquisition strategy research has shown how information sharing is valuable as a strategy to organization in areas like production, financial operations, and marketing. Some researchers have remarked that companies are increasingly looking for competitive success not only through the market strategies but also through the technological acquisition strategy. However, limited empirical evidence exists with respect to the sharing of the forms of private information that are deemed strategic and to their impacts on the organization performance. Thus there is need to undertake a comprehensive research on the technology acquisition strategies and the performance of pharmaceutical companies in Kenya.

**Table 2.1 Summary of Empirical Studies**

<b>Study</b>	<b>Objectives</b>	<b>Methodology</b>	<b>Results</b>
Technological similarity, post-acquisition R&D reorganization, and innovation performance in horizontal acquisitions (Collombo & Robbioso, 2014)	To determine the effect of technological similarity on firm post-acquisition performance	Descriptive research design where interviews and questionnaires was used	Technological similarity negatively affects post acquisition innovation performance
Technological variables and	To determine impacts of	Step-wise regression analysis	exploiting technologically

absorptive capacity's influence on performance through corporate entrepreneurship (García-Morales,; María & Rodrigo,2013)	technological skills on the development of technological distinctive skills		skilled people and the development of technological distinctive competencies increase corporate entrepreneurship
Technology Acquisition strategies in Family and Non-Family Firms: A Longitudinal Analysis of Spanish Manufacturing Firms.	To determine the effect of family owned firms on the absorptive capacity	Descriptive research design	The results show that the moderating effect of family management on the relationship of external technology acquisition is not significant for historical performance
Resource Complementarity and Value Capture in Firm Acquisitions: The Role of Intellectual Property Rights	The role of intellectual Property rights on firm value	Panel Data analysis	

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

The chapter discusses the procedure to be undertaken for the research methodology. It contains the following areas: research design, target population, data collection and data analysis.

### **3.2 Research Design**

This study adopted a cross-sectional descriptive survey. Descriptive research design is a scientific method that involves observing and describing the behavior of a subject without influencing it in any way (Mugenda & Mugenda, 2003). It is suitable for this study because of the large number of respondents and the fact that data was collected at one point in time. Sekaran and Bougie (2010) noted that a survey gathers data at a particular point in time with the intention of describing the nature of existing conditions identify standards against which existing conditions can be compared and determined the relationships that exist between specific events.

A descriptive cross sectional study is concerned with determining the frequency with which something occurs or the relationship between variables. Thus, this approach was appropriate for this study, since the study was intended to collect detailed information through descriptions and is useful for identifying variables. A descriptive research designed was adopted because the study was concerned about a univariate question in which the researchers asked questions about the size, form and distribution. This permitted the researcher to make statistical inference on the broader population and generalize the findings to real life situations and thereby increase the external validity of the study.

### **3.3 Population of Study**

A population is a complete set of people, services, elements, events, group of things or households that are being investigated (Mugenda & Mugenda, 2003). Additionally, Sekaran and Bougie (2010) assert that a population involves a group of individual,

objects or items from which samples are taken for measurement. A research study's population should be clearly defined and the unit of analysis should be identified, which is not easy sometimes. The population of the study consisted of all the units being studied. The unit of analysis is the entity or who is being analyzed. The population of the study comprised of all the 50 companies licensed to import and distribute pharmaceutical products in Kenya.

### **3.4 Data Collection**

Data was collected using primary data. The structured questionnaires were used to collect data. The questionnaires were designed on a five point Likert type scale and was administered through a drop and pick method. A questionnaire, as the data collection instrument of choice is, easy to formulate and administer and also provides a relatively simple and straightforward approach to the study of attitudes, values, beliefs and motives. The questionnaire was administered through drop and pick later method. The questionnaire was made up of three sections. Section A covered demographic characteristics of respondents; Section B dealt with technology strategies while Section C dealt with organizational performance.

### **3.5 Data Analysis**

The data collected was analyzed using descriptive statistics (measures of central tendency and measures of variations). Once the data was collected, the questionnaires were edited for accuracy, consistency and completeness. However, before final analysis was performed, data was cleaned to eliminate discrepancies and thereafter, classified on the basis of similarity and then tabulated. The responses were coded into numerical form to facilitate statistical analysis. Results were presented in tables and charts. Regression analysis was used to establish the relationship between technology acquisition strategies and performance of pharmaceutical firms in Kenya.

## CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

### 4.1 Introduction

This chapter presents the analysis, findings and discussion. The findings were presented in percentages and frequency distributions, mean and standard deviations.

### 4.2 Response Rate

A total of 30 questionnaires were issued out and only 26 were returned after filling. This represented a response rate of 87%. This response rate was adequate for data analysis and conforms to Mugenda and Mugenda (2003) stipulation that a response rate of 70% and over was adequate.

### 4.3 Demographic Characteristics of the Respondents

The demographic characteristics that were considered in this study included the level of education, length of continuous service, duration of pharmaceutical companies operation and duration of importing and distributing product in Kenya. Table 4.1 shows the respondents demographic information.

**Table 4.1: Demographic Characteristics of Respondents**

Category	Item	Frequency	Percentage	Cumulative Percent
Level of education	Post graduate	10	38.5	38.5
	University	16	61.5	100.0
Length of continuous service	Less than 5 years	1	3.8	3.8
	5 – 10 years	15	57.7	61.5
	Over 10 years	10	38.5	100.0

**Source: Research Data (2017)**

The results on the level of education indicate that 61.5% of the respondents have attained university level while 38.5% of the respondents indicated that they have attained postgraduate level of education. The results indicate that all the respondents have attained graduate level and above and therefore they understand the effect of technology acquisition strategies on performance of pharmaceutical firms importing and distributing products. The level of education has been cited as a critical success factor in helping firms survive and manage in difficult conditions and to improve business profitability and thus the firms have the employees who are knowledgeable to drive the firm business objective.

Further, the findings were that 57.7% of the respondents have worked in the pharmaceutical companies for a period between 5 and 10 years; 38.5% of the respondents indicated that they have worked in the pharmaceutical companies for more than 10 years. The respondent noted that 3.8% had worked in the companies for less than 5 years. The results indicate that majority of the respondents have worked in the pharmaceutical company for a long time, therefore they more experience and they understand the market dynamics that the companies face and therefore the need of technology acquisition strategies in order to improve their performance.

**Table 4.2: Demographic Characteristics of the Firms**

Duration of pharmaceutical companies operation	6 – 10 years	1	3.8	3.8
	11 – 15 years	5	19.2	23.1
	16 – 20 years	4	15.4	38.5
	Over20 years	16	61.5	100.0
Duration of importing & distributing product in Kenya	6 – 10 years	3	11.5	11.5
	Over 10 yrs	23	88.5	100.0

**Source: Research Data (2017)**



The results indicate that 61.5% of the respondents said that the pharmaceutical companies have been in operation for over 20 years; 19.2% of the respondents said that the pharmaceutical companies have operated for a period between 11 and 15 years while 15.4% of the respondents indicated that the pharmaceutical companies have operated for a period between 16 and 20 years. The respondents further indicated that 3.8% of the pharmaceutical firms have been in operation in Kenya for a period between 6 and 10 years. The results indicate that majority of the pharmaceutical companies have been in operation in Kenya for more than 10 years and therefore they know the changes that have taken place in the sector and the need for the firms to pursue technology acquisition strategies in order to be competitive in the market and at the same time improve their performance.

The results on the duration of pharmaceutical companies on importing & distributing product in Kenya show that 88.5% of the companies have been importing and distributing products for more than 10 years. The respondent further said that 11.5% of the companies have been in the business of importing and distribution for a period between 6 and 10 years. The results indicate that the pharmaceutical companies have been in the business of importing and distributing pharmaceutical products for a long time and therefore they are familiar with the strategies which improve their performance.

#### **4.4 Factors that Influenced the Technology Acquisition Strategies**

The adoption and usage of technologies acquired by the pharmaceutical importing and exporting companies is affects the normal operations of the firms thus the need to understand the factors that influence adoption of technology acquisition strategy. The range was ‘not at all (1)’ to ‘very great extent’ (5). The scores of respondents’ disagreement represent a variable which had a mean score of below 3.0 while the scores of above 3.0 represent respondents’ agreement with the use of strategy to enter the markets. A standard deviation of  $>0.9$  implies a significant difference on the impact of the variable among respondents. Table 4.2 shows the factors influencing the technology acquisition strategy.

**Table 4.3: Factors that Influenced the Technology Acquisition Strategy**

Factors influenced the technology acquisition strategy	Mean	Std. Deviation
Market trends	4.275	.833
Technology capability of the company	4.125	.784
Technological relevance	4.113	.924
Firm's finances and human resources	4.011	.784
Absorptive capacity of the company	3.961	.870
Firm's customers and competitors	3.846	1.189
Firm strategy - identifying when to alternate between for external vs. internal technology development	3.730	.874
Perceptions of the firm's employees	3.730	.961
The technology suppliers	3.423	1.137

**Source: Research Data (2017)**

The results on the factors that influence technology acquisition strategy by the importing and distributing firms were found to be market trends (M=4.275); technology capability of the company (M=4.125); technological relevance (M=4.113) and firm finances and human resources (M=4.011). The respondent further noted that factor of absorptive capacity of the company (M=3.961); firm's customers and competitors (M=3.846); perceptions of the firm's employees (M=3.730) and technology supplies (M=3.423) were found to have influenced the extent to which the firms used he acquired technologies. This implies that factor of market trends; Technology capability and technological relevance were the most influential of technology acquisition strategy.

#### **4.5 Technology Acquisition Strategies of Pharmaceutical Companies in Kenya**

Firms engage in the process of technology acquisition by either adopting technology developed outside the firm, or engaging in internal research and development to develop own technology.

#### 4.5.1 In-house Development

The in-house development strategy by the pharmaceutical firms enables them to customize their strategies to towards achievement of organizational objectives. The results are presented in Table 4.3.

**Table 4.4: In-house Development**

In-house Development	Mean	Std. Deviation
It strengthen the interactions among individuals and organizations	4.384	.697
It allows firms to innovate more rapidly	4.192	.988
It enhances the abilities of the company to recognize, search, and represent problems, and to assimilate and utilize new knowledge for problem solving	4.038	.923
It leads to a greater rate of new discoveries	3.923	.898
It helps the company reduce the demand for external technology	3.615	1.238

**Source: Primary Data**

The result indicate that in house development strengthen the interactions among individuals and organizations (M=4.384); allows firms to innovate more rapidly (M=4.192); enhances the abilities of the company to recognize, search, and represent problems, and to assimilate and utilize new knowledge for problem solving (M=4.038). The respondent further noted that in-house development leads to a greater rate of new discoveries (M=3.923) and that it helps the company reduce the demand for external technology (M=3.615). From the findings, it can be concluded that in house development strategy enables the company to be innovative and reduce reliance on external technology. The innovativeness of the company strengthens employee interactions in the companies thus resulting in a cohesive working environment.

#### 4.5.2 Technology Purchasing

Technology purchasing occurs when the companies acquires the needed technology for their operations from other firms. This was important for the study in order to understand the extent to which the pharmaceutical firms were using technology purchased. Table 4.4 represents the results on the technology purchasing variable.

**Table 4.5: Technology Purchasing**

Technology Purchasing	Mean	Std. Deviation
It enables the company to utilize external sources as a means of enhancing innovative performance	3.965	.7204
The company benefits from a larger range of technological solutions and hence take advantage of new business opportunities	3.948	.9923
It allows firms to acquire the best available technology	3.923	1.0923
It results in sharing of risks related to technology developments among a firm's suppliers	3.625	.8908
The companies can greatly enrich its internal knowledge and technology base	3.884	.8638
It results in greater flexibility in acquiring new technologies and systems	3.807	1.0593
It provides flexibility in strategic decision-making for technology development	3.769	.8154
It enables the company to focus their resources and capabilities on core technological competencies	3.500	1.2030
It reduces time to market	2.961	1.2438

**Source: Primary Data**

The result indicate that technology purchasing enables the companies to utilize external sources as a means of enhancing innovative performance (M=3.965) and that the companies benefit from a larger range of technological solutions and hence take advantage of new business opportunities (M=3.948). In addition, the respondent found

that technology purchasing allows firms to acquire the best available technology (M=3.923); sharing of risks related to technology developments among a firm’s suppliers (M=3.6253) and that companies can greatly enrich its internal knowledge and technology base (M=3.884). Further, the finding indicated that it provides flexibility in strategic decision-making for technology development (M=3.769) and enables the company to focus their resources and capabilities on core technological competencies (M=3.5000). This indicate that technology purchasing enable the companies utilize the best technology in the market while at the same time enriching their technology which results in flexible decision making. The companies are also able to utilize the resources that would have been used in technology innovation in core technological competencies.

#### 4.5.3 Collaborative Development

The respondents were requested to indicate the extent to which collaborative development has enabled the pharmaceutical firms acquire new technology. The results were presented in Table 4.5.

**Table 4.6: Collaborative Development**

Statement	Mean	Std. Deviation
The company is more successful in new product introductions due to leverage between external technology sourcing as a complement to internal R&D investments	4.092	.9348
The company can enhance their innovativeness by effectively combining their internal knowledge with externally acquired technology	4.038	.9156
The company understand the external knowledge better and readily apply it for innovation purposes	3.923	.9348
It allow firms to benefit from research complementarities though involvement in multiple technological trajectories, research directions that cannot be developed simultaneously	3.884	1.0325
The possess efficient learning processes and broad experiences	3.576	.9021

**Source: Primary Data**

Table 4.6 shows the results on the extent to which collaborative development was being used by the pharmaceutical firms to acquire technology. The results indicate that the companies were more successful in new product introductions due to leverage between external technology sourcing as a complement to internal research and development investments (M=4.092) and that the companies enhance their innovativeness by effectively combining their internal knowledge with externally acquired technology (M=4.038). In addition, the companies understand the external knowledge better and readily apply it for innovation purposes (M=3.923); allows firms to benefit from research complementarities though involvement in multiple technological trajectories and research directions that cannot be developed simultaneously (M=3.884) and that it possess efficient learning processes and broad experiences (M=3.576). The results show that by collaborating with other institutions, the pharmaceutical firms were able to leverage between external technologies sourcing as a complement to internal research and this enhances innovativeness of the firms.

#### 4.6 Performance Indicators

The competition in the pharmaceutical industry has seen the firms acquire new strategies in order to improve their performance and be competitive in the market.

**Table 4.7: Performance indicators**

Statement	Mean	Std. Deviation
It increases the company competitive positioning	4.1538	.8339
It increases productivity of the company	4.0769	1.1286
Increased company sales	4.0385	.9992
Efficiency in distribution of products	3.9864	1.0954
Improved customer satisfaction	3.8077	1.2006
It enhances the purchase of organizational products by the consumer	3.8077	.9805
Customer loyalty	3.6538	1.0933
Increased company market share in the country	3.5941	1.1980
Reduced costs	3.5769	1.2384

**Source: Primary Data**

The results show that technology acquisition strategies enables pharmaceutical firms increase their competitive positioning (M=4.1538); increases productivity of the company (M=4.0769); increases company sales (M=4.0385); efficiency in distribution of products (M=3.9864) and improved customer satisfaction (M=3.8077). The respondents further said that the strategies enhances the purchase of organizational products by the consumer (M=3.8077); customer loyalty (M=3.6538); market share (M=3.5941) and reduced costs (M=3.5769). The results show that technology acquisition strategies was important to the pharmaceutical firms as it enables the firms increase their competitive position in the industry, increase sales, efficiency in distribution of products, market share and reduced costs. The technologies further enhance customer purchase of products creating customer satisfaction and loyalty.

#### **4.7 Relationship between Technology Acquisition Strategies and Performance of Pharmaceutical Companies in Kenya**

The relationship between pharmaceutical firms importing and distributing products and performance was tested by using linear regression analysis, based on the regression model presented. Table 4.8 shows the model summary, ANOVA and coefficients of regression.

**Table 4.8: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.859 <sup>a</sup>	.738	.707	.49933

**Source: Primary Data**

Table 4.8 shows that the coefficient of determination that is the percentage variation determination in the dependent variable is supported by the variation in independent variables. R square is 0.738 which implies that variance in performance of the pharmaceutical firms importing and distributing products can be explained by in-house development, technology purchasing and collaborative development. Adjusted R squared is coefficient of determination which tells us the variation in the dependent variable due

to changes in the independent variable. From the results of the study, the value of adjusted R squared was 0.707 which indicates that the independent variable, explain 70.7% of pharmaceutical firms importing and distributing products performance. This therefore means that other factors not studied in this research contribute 29.3% of the firms' performance. The results of the ANOVA analysis is presented in Table 4.9.

**Table 4.9: ANOVA Results**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17.560	3	5.853	23.476	.000
	Residual	6.233	25	.249		
	Total	23.793	28			

**Source: Primary Data**

To test the significance of the coefficient of determination, the results were presented in ANOVA table. From the table it can be seen that at  $\alpha = 5\%$ , the value of  $F_{stat}$  obtained at 23.476 and 0.000 sig.  $F_{tab}$  value at  $\alpha = 5\%$  was 3.84. Thus  $F_{stat}$  value is greater than the  $F_{tab}$  value. These results demonstrate that the coefficient of determination is a significant value. That is, simultaneously model has a good fit. The results on the regression among the variables is presented in Table 4.10.

**Table 4.10: Regression Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.226	.492		2.490	.020
	In-house development	.677	.091	.833	7.453	.000
	Technology purchasing	.111	.128	.109	.870	.033
	Collaborative development	.030	.111	.034	.268	.011



From the data, the generated table was

$$Y = 1.226 + 0.677X_1 + 0.111X_2 + 0.030X_3$$

From the above regression equation it was revealed that holding in-house development, technology purchasing and collaborative development to a constant zero, performance of the pharmaceutical firms importing and distributing products would be at 1.226; a unit increase in in-house development would lead to an increase in performance by 0.677; a unit increase in technology purchasing would lead to an increase in performance by 0.111 and a unit increase in collaborative development would lead to increase in performance by 0.030.

#### **4.8 Discussion**

The pharmaceutical industry has grown over the years as a result of the strategies created to oversee the growth; this therefore implies that for the pharmaceutical firms importing and distributing products to survive it must put in place strategies that match the current business environment demand. One of the strategies put in place by the firms is technology acquisition strategy. The adoption and usage of any acquired technology is however dependent on several factors that were found to include market trends, technology capability of the company, technological relevance and finances and human resources. Other factors were found to be absorptive capacity of the company, firm customers and competitors and perceptions of the firm's employees. The results of the study were found to be consistent with Cohen and Levinthal (2010) findings that key factors influencing technology acquisition in many firms are firm strategy, market trends, technological capability and technological relevance. These are the primary factors, which in turn are affected by factors internal to the firm, such as the firm's finances and human resources, and the intangible factors relating to the uncertainty associated with the acquired technology, and the experience level and perceptions of the firm's employees.

The pharmaceutical industry in Kenya has experienced a rigorous process of significant transformation in recent days. Behind this transformation lies innovation which has seen importing and distribution pharmaceutical firms' develop their technology in-house. The development of technologies has enabled the companies to be innovative and reduce

reliance on external technology. The innovativeness of the companies strengthens employee interactions in the companies thus resulting in a cohesive working environment. The findings were found to be in line with Hagedoorn (2009) findings that internal research and development activities strengthen the interactions among individuals and organizations. Greater commitment to internal research and development leads to a greater rate of new discoveries, as well as to improvements in the flow of new scientific knowledge into firms. Veugelers and Cassiman (2012) noted that having a strong knowledge base is the key to successful technological innovation. The internal knowledge base of a firm is the base for new technological developments; hence, it helps firms to innovate.

The changes which are happening in pharmaceutical environment such as globalization and deregulation have made the pharmaceutical sector become highly competitive. The aggressiveness in increasing competition among the pharmaceutical firms is the main issue for those firms to find several solutions and options to improve their services. Faced with accelerating changes of the technological environments and increasing international competition, firms need to possess the ability to timely update their technological knowledgebase in order to survive. Thus in order for technological firms to succeed they resort to technological purchasing which enables the companies to utilize the best technology in the market while at the same time enriching their technology which results in flexible decision making. The companies were also able to utilize the resources that would have been used in technology innovation in core technological competencies. The findings of the stud were found to be consistent with Jones *et al.*, (2011) findings that external technology acquisition allows firms to acquire the best available technology, reduce time to market, and focus their resources and capabilities on core technological competencies. Haspeslagh and Jemison (2011) findings were that external technology acquisition allows firms to specialize deeper in their core competences while relying on outside firms that are specialized in other fields, for complementary expertise and skills. Also external technology acquisition provides flexibility in strategic decision-making for technology development.

Today's business environment is changing at a higher rate than in the past. The changes in business environment and an increasing openness of economies have amplified the potential value that may be created through inter-organizational cooperation, permitting organizations to set up closer relationships with collaboration than hitherto possible. A combination of internal research and development and external technology sourcing through alliances positively reinforces firms' innovative output. The contribution of external technology acquisition to firm performance increases with the level of internal research and development efforts. The combination of external technology sourcing and internal research and development can allow firms to benefit from research complementarities through involvement in multiple technological trajectories, research directions that cannot be developed simultaneously (at sufficient speed) in-house, and external skills in the exploitation of in-house research activities. These were found to be consistent with the findings of the study which established that collaboration of pharmaceutical firms with other organizations in technology acquisition enables the firms to leverage between external technologies sourcing as a complement to internal research and this enhances innovativeness of the firms. Collaborations are increasingly becoming popular in the business world and therefore in order for the pharmaceutical firms to achieve competitive advantage, firms need to combine their assets and capabilities in order to increase their bargaining power and competitiveness.

As companies face pressure from increased competition, growing product complexity and shortening product life cycles, many are finding the need to change the way they develop new technologies, products and services. Today, technology has become not only a tool to process data and record transactions, but also a competitive weapon that can change an industry's structure. The pharmaceutical industry has seen increased usage of technology by the firms in order to achieve competitive advantage over its competitors. The study established that the firms' technology acquisition strategies have seen the pharmaceutical firms increase their competitive position in the industry, increase sales, efficiency in distribution of products, market share and reduced costs. The technologies further enhance customer purchase of products creating customer satisfaction and loyalty.

The results of the study were found to be consistent with Brynjolfsson and Hitt (2003) findings that technology has a solid impact on productivity and on the performance of the organization's activities.

## **CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS**

### **5.1 Introduction**

The chapter covered summary of the findings, conclusions, limitations of the study, recommendations and suggestions for further research.

### **5.2 Summary of Findings**

The dynamic business environment has brought complexities and challenges that have affected pharmaceutical firms dealing with importation and distribution of products in meeting their objectives. This has made them rethink their strategies and adapt in order to better respond to the ever changing environment. Technology acquisition strategies are one tool the firms have embraced to deal with the challenges and this has seen them benefit from the strategies they have acquired. The adoption and usage of the technology acquisition strategies by the firms is however determined by several factors that include are firm strategy, market trends, technological capability and technological relevance. Other factors were found to be firm finances and human resources, absorptive capacity of the company, firm's customers and competitors and technology supplies.

The current society which is knowledge driven has seen technology play a central role in real economic growth and development. The development of technology used by the firms varies and these depend on several factors. In-house development is one strategy that has been pursued by the pharmaceutical firms and it enables the companies to be innovative and reduce reliance on external technology. The innovativeness of the company strengthens employee interactions in the companies thus resulting in a cohesive working environment. The cost of developing technology in house could be high for the companies and therefore they resort to purchasing technology which enable the companies utilize the best technology in the market while at the same time enriching their technology which results in flexible decision making. The companies were also able to utilize the resources that would have been used in technology innovation in core technological competencies.

In the present day business environment, pharmaceutical firms are confronted with substantial increases in both competition and uncertainty and consequently the management of these firms have realized that they need to look outside the organization for collaborations that brings about an operational synergy. Collaborating with other institutions has seen the pharmaceutical firms were able to leverage between external technologies sourcing as a complement to internal research and this enhances innovativeness of the firms. The technologies acquired by the firms was important to the pharmaceutical firms as it enables the firms increase their competitive position in the industry, increase sales, efficiency in distribution of products, market share and reduced costs. The technologies further enhance customer purchase of products creating customer satisfaction and loyalty.

### **5.3 Conclusion**

Today, even the largest and most technologically self-sufficient organizations require knowledge from within and outside their boundaries. Faced with accelerating changes of the technological environments and increasing international competition, pharmaceutical firms need to possess the ability to timely update their technological knowledge base in order to survive. Technology acquisition strategies however are affected by several factors that need to be taken into consideration by the firms in order to compete effectively in the market. Evaluation of these key factors must come into play when considering technology acquisition. Firm strategy provides the guiding light in the decision-making process, while market trends, technological capability and technological relevance can strongly influence the decisions made. Internal research and development allows firms to gain a deeper understanding of existing internal and external knowledge, and thus helps them create new technological advances. Therefore, firms need to make great efforts towards internal research and development and to enhance their internal knowledge base to maintain technological competence and enjoy long-term competitive advantage.

It is inevitable for firms to use external technology acquisition. More and more innovation active organizations try to leverage both external sourcing and internal

research and development to enhance their innovative capabilities. The findings clearly show that external technology acquisition can be a double-edged sword for firms' technological competences and long-term competitive advantage. It is difficult for firms to successfully leverage both external sourcing and internal research and development. Therefore, firms should maintain harmony and strike a balance between their external sourcing and internal research and development for technological renewal and long-term competitive advantage. The study concludes that technology acquisition strategies was important for the firms as it has enabled them to increase their competitive position in the industry, increase sales, efficiency in distribution of products, market share and reduced costs. The technologies further enhance customer purchase of products creating customer satisfaction and loyalty.

#### **5.4 Recommendations for Policy and Practice**

The study found out that technology acquisition strategy enables the importing and distribution firms to improve their performance; it is recommended that the firms should adapt and develop their strategies to achieve superior performance. The study found out that technology acquisition strategy success is determined by several factors that need to be taken into consideration by the firms. It is therefore recommended that their need to be managerial as well as strategic fit evaluation of the partners before the acquisition is entered into. More involvement of top level management is required to offer leadership support to the acquisition strategy and there is a better chance of success.

The study also recommends that a better understanding of the relationship between technology and productivity will further aid in framing the right policies for the pharmaceutical firms. This study provides evidence for policy makers that technology acquisition into the country needs to be deliberate and properly regulated. This implies that firms' technology acquisition processes will not produce desired results if they are not tailored towards the unique needs of the company. The government also needs to come up with policies that make operating business climate to guarantee investors protection on intellectual property. This is because the effectiveness of the process of technology acquisition and development is guaranteed under an effective system of

intellectual property protection. Industrial policies should thus be designed to ensure effective technology acquisition and research and development activities among the pharmaceutical firms.

### **5.5 Limitations of the Study**

The study used key informants from the pharmaceutical firm importing and distributing products which put constraints on the generalizability of the results to other firms and other country contexts. The sample selection may also limit the generalization of results to the overall population. The narrow and specific focus of this study means the results are limited to the pharmaceutical industry only which may not translate to other industry and national contexts.

The methodology required the use of both qualitative and quantitative methods of data collection but the analysis were more of qualitative due to the lack of finances and time, to effectively measure the influence of technology acquisition strategies, a period of one year or more is needed to monitor the activities of the acquired technologies thus the different methods should be given equal considerations.

### **5.6 Suggestion for Further Research**

The study was undertaken among the pharmaceutical firms involved in importation and exportation of products and it is recommended that further study needs to be undertaken among all the pharmaceutical firms operating in Kenya. Secondly the study should be undertaken in other industry context. The Government, retail industry and travel industries are also adopting technology acquisition strategies on an increasing basis and it would be useful to determine whether the impact on relationships differs between industries and the type of technology.



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## APPENDIX I: QUESTIONNAIRE

Please give answers in the spaces provided and tick (√) the box that matches your response to the questions on technology acquisition strategies and the performance of pharmaceutical companies in Kenya.

### Section A: Demographic Information

- 1) Name of pharmaceutical company: \_\_\_\_\_
- 2) What is your highest level of education qualification?
  - a) Post graduate level ( )
  - b) University ( )
  - c) Tertiary College ( )
  - d) Secondary ( )
- 3) Length of continuous service with pharmaceutical companies?
  - a) Less than five years ( )
  - b) 5-10 years ( )
  - c) Over 10 years ( )
- 4) For how long has your company been in existence?
  - a) Under 5 years ( )      b) 6 – 10 years ( )
  - c) 11 – 15 years ( )      d) 16 – 20 years ( )
  - e) Over 25 years ( )
- 5) For how long has your company been importing and distributing products in Kenya?
  - a) Less than two years ( )
  - b) 2-5 years ( )
  - c) 6-10 years ( )
  - d) Over 10 years ( )

### Section B: Technology Acquisition Strategies

- 6) To what extent has the following factors influenced the technology acquisition strategy to be adopted by your company? Use 1-Not at all, 2-Small extent, 3-Moderate extent, 4-Great extent and 5-Very great extent.

<b>Factors influenced the technology acquisition strategy</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Firm strategy - identifying when to alternate between for external vs. internal technology development					
Market trends					
Technology capability of the company					
Technological relevance					
Firm's finances and human resources					
The technology suppliers					
Firm's customers and competitors					
Perceptions of the firm's employees					
Absorptive capacity of the company					

- 7) To what extent do you agree with the following statements on the usage of technology acquisition strategies by your company? Use 1-Strongly disagree, 2-Disagree, 3-Moderate extent, 4-Agree and 5-Strongly disagree.

<b>In-house Development</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
It allows firms to innovate more rapidly					
It leads to a greater rate of new discoveries					
It strengthen the interactions among individuals and organizations					
It enhances the abilities of the company to recognize, search, and represent problems, and to assimilate and utilize new knowledge for problem solving					
It helps the company reduce the demand for external technology					
<b>Technology Purchasing</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
The companies can greatly enrich its internal knowledge and technology base					
It enables the company to utilize external sources as a means of					

enhancing innovative performance					
It allows firms to acquire the best available technology					
It reduces time to market					
It enables the company to focus their resources and capabilities on core technological competencies					
It provides flexibility in strategic decision-making for technology development					
The company benefits from a larger range of technological solutions and hence take advantage of new business opportunities					
It results in greater flexibility in acquiring new technologies and systems					
It results in sharing of risks related to technology developments among a firm's suppliers					
<b>Collaborative Development</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
The possess efficient learning processes and broad experiences					
The company understand the external knowledge better and readily apply it for innovation purposes					
The company can enhance their innovativeness by effectively combining their internal knowledge with externally acquired technology					
The company is more successful in new product introductions due to leverage between external technology sourcing as a complement to internal R&D investments					
It allow firms to benefit from research complementarities though involvement in multiple technological trajectories, research directions that cannot be developed simultaneously					

- 8) To what extent has technology sourcing strategies affected the following performance measures in your pharmaceutical company? Use 1-Not at all, 2-Small extent, 3-Moderate extent, 4-Great extent and 5-Very great extent.

<b>Performance indicators</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Improved customer satisfaction					
Customer loyalty					
It enhances the purchase of organizational products by the consumer					
Efficiency in distribution of products					
It increases productivity of the company					
It increases the company competitive positioning					
Increased company sales					
Increased company market share in the country					
Reduced costs					



**APPENDIX III: LIST OF PHARMACEUTICALS COMPANIES IN NAIROBI  
CITY COUNTY**

- |                                  |   |
|----------------------------------|---|
| 1) Mentholatum                   | 26) Cosmos Ltd                              |
| 2) Synermed Pharmaceuticals ltd. | 27) Laborex (K) Ltd                         |
| 3) Simba Pharmaceutical ltd.     | 28) Europa Healthcare Ltd                   |
| 4) UCB Pharma                    | 29) Galaxy Pharmaceutical Ltd               |
| 5) Prisma                        | 30) Glenmark Pharmaceutical Ltd             |
| 6) Adcock Ingram                 | 31) Cadilla Pharmaceutical Ltd              |
| 7) Servier international         | 32) Sun Pharmaceutical Lt d                 |
| 8) Reckit and Benkiser           | 33) Sai Pharmaceutical Ltd                  |
| 9) Dafra Pharma                  | 34) Medisel Kenya Ltd                       |
| 10) Almirall Prodesfama          | 35) Pan Pharmaceutical Ltd                  |
| 11) Mepha Pharma                 | 36) Regal Pharmaceutical Ltd                |
| 12) Medrich                      | 37) Sai Care Pharmaceutical Ltd             |
| 13) Denk pharma                  | 38) Lords Healthcare Ltd                    |
| 14) Menarini                     | 39) Surgilink Pharmaceutical Ltd            |
| 15) Bristo-Myers Squibb(BMS)     | 40) Surgipham Ltd                           |
| 16) Hoffman La Roche             | 41) Pharmaceutical Manufacturing Co (K) Ltd |
| 17) Novartis                     | 42) Madawa pharmaceutical Ltd               |
| 18) Glaxo Smithkline             | 43) Universal Corporation Ltd               |
| 19) Pfizer Laboratories          | 44) Pharmaken Ltd                           |
| 20) Harley's Limited             | 45) Oss-Chemie (K) Ltd                      |
| 21) Philips Pharmaceutical ltd.  | 46) Roche (K) Ltd                           |
| 22) Kulal International          | 47) Mac Naughton Ltd                        |
| 23) AstraZeneca                  | 48) Metro Pharmaceutical                    |
| 24) Sanofi Aventis               | 49) Laboratory and Allied Ltd               |
| 25) Sanofi – Pasteur             | 50) Elys Chemical Industries Ltd.           |

*Source of information: Pharmacy and Poisons Board Website, December 2016*