ANTI-COUNTERFEITING STRATEGIES ADOPTED BY PHARMACEUTICAL MANUFACTURING FIRMS IN KENYA AND ORGANIZATIONAL PERFORMANCE

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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.

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D61/80507/2012

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

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DEDICATION

I would like to dedicate this research project to my parents Mr. Henry Marete and Mrs. Tabitha Marete. Thank you so much for your love and support.

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LIST OF ABBREVIATIONS AND ACRONYMS

KAM: Kenya Association of Manufacturers

IPR: Intellectual Property Rights

WHO: World Health Organization

RFID: Radio Frequency Identification Devices

WTO: World Trade Organization

TRIPS: Trade Related Aspects of Intellectual Property Rights

OTC: Over the Counter

COMESA: Common Market for Eastern and Southern Africa

GMP: Goods Manufacturing Practices

ARIPO: African Regional Industrial Property Organization

KEMSA: Kenya Medical Supplies Agency

MNCs: Multi National Corporations

MEDS: Mission Based Medical Supply

KEMRI: Kenya Medical Research Institute

ABSTRACT

The study general objective was to investigate the anti-counterfeiting strategies adopted by pharmaceutical manufacturing firms in Kenya and organizational performance. The objectives of the study were; to determine anti-counterfeiting strategies adopted by pharmaceutical manufacturers in Kenya and to establish the effect of anti-counterfeit strategies on performance of pharmaceutical manufacturers in Kenya. The research employed a descriptive research design. The study was carried out in 23 companies that were listed as pharmaceutical manufacturing firms in Kenya by the Kenya Manufacturers and exporters' 2014 directory, 10th edition. Since the population was relatively small, a census survey was employed. Both primary and secondary data was collected. A semi-structured questionnaire was used to collect primary data. The quantitative data obtained were first checked for errors, completeness then coded and entered in SPSS program before analysis. The data was analyzed using descriptive statistics such as frequency, percentages, mean and standard deviation. Content analysis was used in processing of qualitative data and results presented in prose form. The study also found that anti-counterfeit strategies had led to improved organization performance this was through, increased brand loyalty to a great extent. The study further found that counterfeits affected innovation to a great extent and that counterfeits caused loss of goodwill of the brand to a great extent. The study further concludes that taking all other independent variables at zero, a unit increase in embossed optical films will lead to an increase in the scores of the organizational performance. A unit increase in high resolution printing will lead to an increase in organizational performance. On the other hand, a unit increase in taggants will lead to an increase in the scores of the organizational performance; and a unit increase in Radio frequency identification devices (RFID) will lead to an increase in the scores of the organizational performance. This infers that embossed optical films influences the organizational performance most followed by taggants, high resolution printing and then Radio frequency identification devices (RFID). The study also established a significant relationship between organizational performance and the independent variables; embossed optical films, high resolution printing, taggants and Radio frequency identification devices (RFID). From the above conclusions the study recommend the companies should clearly understand the effect of counterfeit drugs and the consequences of such drugs to their business and to the patient who end up consuming the counterfeited drugs. Further all cases of counterfeiting should be reported to regulatory authorities for action.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Globally counterfeits are sold in all notions and trademarks; they can be available anywhere in the world and in all sectors of the global economy. The products are produced and sold in underground economies or in unregulated economies where they escape normal tax tariff. The changing technology has greatly contributed to the rise in counterfeits and pirated drugs; this has greatly resulted to influx of such medicines into the market. Copy right infringement is a critical problem in global sales and marketing and it takes different forms. The first one is unauthorized copying and production of a product. An associative counterfeit or imitation uses a product name that differs slightly from a well-known brand; it is close enough that consumers associate it with a genuine product (Ennew *et al.*, 2007). The second one is piracy, the unauthorized production or reproduction of copy, written material or work. The infringement of intellectual property rights (IPR) is well described in the W.T.O agreement on trade related aspects of international property rights (TRIPS) which includes patents, designs, rights amongst other rights (WTO,2001).

Resource Based Theory (RBV) of the firm is one of the theoretical frameworks of this study. The foci of RBV are competitive advantages generated by the firm from its unique set of resources (Wernerfelt, 1984; Barney, 1986, 1991; Peteraf, 1993). According to Barney (1991), RBV has been used to studying a firm's internal strengths and weaknesses. Firms' resources include all inputs that allow the firm to work and to implement its strategies (Olavarrieta, 1996). Firm resources' can be tangible or intangible (Hall, 1992) and they may have been developed inside the firm

or acquired in the market. Other theories that this study will be based on include; Open Systems theory and The Dynamic Capabilities Theory.

Organizational performance is greatly affected by the presence of counterfeits. Manufacturers spend colossal sums of money in advertising, in the bid to market their goods. An unfair trade practice through intrusion in one's hard earned market zones is the greatest impediment to a manufacturer's sale. This translates into reduced sales, reduced margins; this may lead to either scaling down operations or closing altogether of manufacturing firms. Counterfeit trading practices encourage evasion of taxes and impacts negatively on the country's economy. The effect on economic growth greatly reduces job creation and purchasing power, resulting into widespread poverty because of reduced sales (Globerman, 2007).

The WHO estimates that approximately 10 percent of the global pharmaceutical market consist of counterfeit drugs, however this estimate increases to 25 percent for developing countries, and may exceed 50 percent in certain countries (World Health Organization, 2005). Appearance of counterfeit medicines in international commerce was first mentioned as a problem at the WHO Conference of Experts on Rational Drug Use in Nairobi, Kenya in 1985 (WHO 2005).

1.1.1 The Concept of Strategy

Strategy is Key in the overall performance of the organization. The environment influences the link between strategy and performance. Strategy can either be deliberate or emergent. Deliberate strategy is applied more in the large organizations since they have the strategic planning process involving strategy formulation,

implementation, evaluation and control. They have formal strategic planning as opposed to small scale organization businesses which employ informal strategic planning process. Strategy choice is facilitated by strategy analysis.

The field of strategic management has received enormous development with different multiple perspectives. According to Mintzberg et al (1998) there are five main and interrelated definitions' of strategy: Plan, Ploy, Pattern, Position and Perspective. It is the direction and scope of an organization over the long term, which achieves advantage in a changing environment through its configuration of resources and competencies with the aim of fulfilling stakeholder expectations (Johnson et al., 2008). An organizations strategy consists of the competitive moves and business approaches that managers are employing to grow the business, attract and please customers, compete successfully, conduct operations, and achieve the targeted levels of organizational performance (Thompson et al., 2007).

Strategy is purposed to achieving four elements. One is to set direction which involves defining a clear and simple long-term goal capable of motivating effort. Two, is concentrating resources, that is, focusing all resources, efforts and enthusiasm in the agreed direction. Three, is maintaining consistency which entails progressing in the same direction, with the same focus over long periods of time, deviating only when necessary. Lastly is retaining flexibility, that is, maintaining a continuous assessment of the various environments and key variables on which the strategy depends and continually reviewing the necessity for revising the agreed strategy (Gordon, 1999).

There is agreement that strategy is concerned with the match between a company's capabilities and its external environment. Argyris (1985) supports the view that strategy responds to external opportunities and threats, and internal strengths and weaknesses. Steiner and Miner (1977) concur that strategy is achieved by forging of company missions and setting objectives for the organization in light of external and internal forces. Mintzberg (1979) upholds the same view by looking at strategy as a mediating force between the organization and its environment, consistent patterns of streams of organizational decisions to deal with the environment.

Overtime, the effectiveness of a strategy is measured to determine its success or failure which reflects on the organizations performance. Haberberg and Rieple (2008) purport that to get a full picture of a firms strategies and how well they are succeeding, demands a very hard-headed kind of analysis, which looks at actions rather than words and results rather than intentions or opinions. What is most important is to achieve performance goals over time and sustain them. The measurement of performance over time together with an assessment of the factors that influence performance provide evidence of the sustainability of strategies and approaches adopted by organizations. The goal of any business is not merely to achieve the performance goals which have been set but achieving them in a sustainable manner (Porter, 1985).

1.1.2 The Concept of Counterfeits

Counterfeiting is unauthorized imitative production of products or a service without authority from the owner's which are protected by Intellectual Property Rights (IPR) in order to make profits. According to Grossman and Sharpiro (2008), counterfeiting is illegally copying authentic goods with a brand name. Counterfeit medicines are

manufactured below established standards of quality and therefore dangerous to patients' health and ineffective for the treatment of diseases. Counterfeits are deliberately and fraudulently mislabeled with respect to identity or source, they may include products with the correct ingredients but fake packaging, with the wrong ingredients, without active ingredients or with insufficient ingredients. Counterfeiting can also occur with both the branded and the generic products.

According to the Kenya Anti-Counterfeit Act established in 2008, counterfeit goods are those that are manufactured, produced, packed, re-packed and labeled as the original product that is already protected without the authority or permission of the owner. It is also the manufacturing, producing or making of copies, in Kenya or elsewhere, in violation of an author's rights or related rights. Counterfeit goods can also be explained as the goods that are colored using the same colors as protected goods, in a way that the consumers will confuse the goods as they purchase.

Anti-malarial drugs, antiretroviral, anti-cancer and anti-viral, antibiotics are among the most counterfeited drugs in developing countries Dahiya (2008). Muthiani (2012) observed that the medicines that are mostly counterfeited include, fast moving and well known drugs, those available over the counter (OTC), supplies to Government institutions and product for export. The presences of counterfeit in the market affect the pharmaceutical business. It affects the brand value and reputation of the manufacturing company. Innovation used by such companies and firms is also affected since they have to invest more on their research and development for them to remain competitive in the market. Counterfeiting affects the pharmaceutical business on sales volume and prices, brand value, pharmacy reputation, royalties, firm level of

investment and cost of operations. Organizations therefore have to upgrade their anti counterfeit strategies from time to time to counter the effects of counterfeits.

1.1.3 Anti-counterfeiting strategies

A critical first step in an anti-counterfeit strategy is developing a typology to define the different types of counterfeiters, counterfeiting and offender groups. It is difficult to expect any measures to eliminate counterfeiting forever, but the aim of counterfeiting strategies should be to make it unattractive for the fraudsters to target the company's products. Safeguards against counterfeiting within private organizations have three main ingredients: anti-counterfeit policy, technologies and legal enforcement (OECD, 1998). A strong quality assurance system is important to serve as a last gate of defense in detecting counterfeit medicines in the supply chain. The quality assurance system ensures that the procured medicines meet the acceptable quality attributes related to supplier prequalification, storage and distribution.

Effectiveness of the reactions to counterfeit incidents is not valuable in preventing future crimes therefore a proactive intervention is necessary. It is therefore important to establish that anti-counterfeit strategies must be based on understanding the nature of the fraud and the fraudster (Spink, 2011). Different approaches ranging from the simple to more complex ones have been adopted by different firms in various capacities to curb the issue of counterfeiting. Commonly used ones include; overt, covert and track and trace technologies.

Overt(visible) anti-counterfeiting packaging strategies allows packaging to be authenticated using visual representations, without requiring expert knowledge or sophisticated devices, which means your customers or inspectors can immediately

authenticate your product or brand without the need for any special tools. These technologies are cheap but can be easily copied. Some of the overt technologies commonly used include; embossed optical film, holograms, high-resolution printing and colour shift-inks. This technology incorporates optically uneven features that make it easy to validate packaging quickly.

Colour-shift inks involve different colour combinations where the specific colours can be detected when viewed at different angles. These physical security solutions are visible to the naked eye. The inks are printed in larger blocks to create an effect whereby the colour change depends on what angle the printed image is looked at. Pfizer, in their effort to tighten anti-counterfeiting measures, was one of the first pharmaceutical companies to introduce a unique company logo using colour-shift ink. Such measures make the packaging difficult to fake but easy to verify.

Holograms can be easily identified and therefore this strategy tends to be the primary method used for instant authentication. To increase the security features of holographic images, nano-text and hidden images are added as second and third level techniques to ensure that the premium product cannot be tampered with along the supply chain.These holographic images are impossible to replicate by traditional printing methods and can be made so minute that they are invisible to the naked eye without the aid of a magnifier.

Covert (hidden) techniques use infrared and ultraviolet (UV) light, micro-text and microscopic tagging, all of which are invisible and difficult to distinguish or copy without special detection devices. Such strategies also employ forensic solutions which include molecular markers and biological tracers that can only be detected with

the use of sophisticated laboratory devices. For example, UV inks can only be seen when using UV light with different frequencies. Colour and UV micro-text print uses text characters that are invisible to the naked eye and are hidden in overt images, without risking detection.

Taggants, radio frequency microchips used in automated authentication, are a technology that uses electronic radio waves to track and identify pharmaceutical products. Taggant systems can be authenticated using special handheld readers from a secure source without endangering the detection of the authenticating machine. An initiative being investigated by the pharmaceutical industry is the use of radio frequency identification devices (RFID) with tags. Pharmaceuticals, such as Pfizer and GlaxoSmithKline, have introduced RFID tags on to the packaging of Viagra and Trizivir (a HIV treatment).

Overt and covert packaging technologies can be combined to provide a higher level of security. Security design tapes and security tear tapes are examples of combining these packaging strategies. Others include; Forensic technology, essentially chemical or biological tags built into medicines packaging. These are seen as more secure against copying but significantly more costly and provide no visible reassurance to customers. Serialization or Track and Trace systems using technologies such as bar codes and RFID help provide authentication by allowing a medicine to be tracked through the supply chain. These require an expensive technical infrastructure and are completely immune to hacking.

However these technologies cannot by themselves stop counterfeiting. Computer and technological illiteracy, lack of infrastructure and cost may limit the ability of

technology to deliver solutions, especially in the underdeveloped economies where the threat posed by counterfeiting is greatest. Technology needs to be combined with other measures such as tough legislation and regulations against counterfeiting, rigorous enforcement, stiffer penalties, and diligent surveillance on the part of the authorities and healthcare providers (Bidin, 2009).

1.1.4 Organizational Performance

Performance is an index that measures the firm's ability to deliver value to customers; it includes high level of customer satisfaction, increasing market share, positive cash flow, low production costs and high productivity growth. Organizational performance comprises the actual output or results of an organization as measured against its intended objectives; it's the most important criterion in evaluating organizations, their actions, and environments. High performance levels are the ultimate goal for any employer as this brings enormous benefits to the organization.

Armstrong (2001) points out that performance management are continuous processes which reflects good management practices of leadership, monitoring, as well as taking action accordingly. Grouw (2000) notes that, improved performance is manifested through among other things delivering quality and timely services to customers, increased wealth, reduced reliance and dependency on management in decision making and presence of accountability and transparency. Organization performance therefore is the ability of an organization to fulfill its mission through sound management, strong governance, and persistent rededication to achieving results. The organization performance construct is probably the most widely used dependent variable in organizational research yet it remains vague and loosely defined (Shields and Shields, 1998).

Performance in an organization reflects the results of effects of implementation of various strategies adopted by firms it can be measured either quantitatively or qualitatively. Most organizations employ quantitative measures to assess the effect of strategy chosen and the success of their implementation. Krager and Parnell (1996) conceptualize financial measurements as an objective of planning. Kaplan and Norton (2008) concur and contend that the Balanced Score Card considers financial indicators as one of the critical measures of performance; measures of performance shall be discussed further in the chapter 2.5.

1.1.5 Pharmaceutical industry in Kenya

The pharmaceutical industry consists of three segments namely the manufacturers, distributors and retailers. All these play a major role in supporting the regions health sector, which is estimated to have about 4,557 health facilities in Kenya alone (Kenya's Pharmaceutical Industry report, 2005). Kenya is currently the largest producer of pharmaceutical products in the Common Market for Eastern and Southern Africa (COMESA) region, supplying about 50% of the regions' market. Out of the regions estimated of 50 recognized pharmaceutical manufacturers, approximately 30 are based in Kenya (Central Bureau of Statistics, 2010).

The players in the local pharmaceutical industry are characterized by common product lines, variation in goods manufacturing practices (GMP) standards, shortage of qualified personnel, low production efficiency and difficulties in carrying out bioequivalence studies for local manufacturers due to financial constraints, lack of know-how, and unavailability of national guidelines on this subject.

It is approximated that about 9,000 pharmaceutical products have been registered for sale in Kenya. These are categorized according to particular levels of outlet as free sales/OTC (Over the Counter), pharmacy technologist dispensable, or pharmacist dispensable or prescription only. The patent protection of pharmaceuticals in Kenya is based on the African Regional Industrial Property Organization (ARIPO) patent system. Additionally, the Kenyan government passed the Kenya Industrial Property Bill in 2001. This bill allows Kenyans to import and to produce more affordable medicines for HIV/AIDS and other diseases.

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. KEMSA buys about 30% of the drugs in the Kenyan market through an open-tender system and distributes them to the government public health facilities (Kenya's Pharmaceutical Industry report, (2005). KEMSA competes with other suppliers such as the mission based medical supply facility (MEDS) and private wholesalers. There are about 700 registered wholesale and 1,300 retail dealers in Kenya, manned by registered pharmacist and pharmaceutical technologists.

1.1.6 Pharmaceutical Manufacturing Firms in Kenya

According to KAM which has 615 member companies, the pharmaceutical sector consists of about 30 licensed concerns which include local manufacturing companies and large Multi National Corporations (MNCs), subsidiaries or joint ventures. Most of these are located within Nairobi and its environs. They collectively employ over 2,000 people with 65% of them working in direct production. 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.

Kenya has minimal raw materials for pharmaceutical products and relies a lot on imported sources, the industry imports over 95% of the raw materials. In efforts to increase supply the government has embarked on specific growth measures which include: drug development from natural sources for the local industry, continued research by institutions such as Kenya Medical Research Institute (KEMRI) and the University of Nairobi on extracts from medicinal and aromatic plants, supplementing mainstream research with herbal medicine by involving local traditional health practitioners and biomedical researchers in research processes.

The products manufactured by the pharmaceutical companies in the country for both local and international markets include Antibiotics, Antimalarials, Antiamoebics, Analgesics, Antidiarrheals, Antacids, Tranquillizers, Antispasmodics, Vitamins and Antiulcers. The pharmaceutical manufacturers are also engaged in assembling capsules, disposable syringes, paracetamol, and surgical gauze among others. The manufacturers' compound and package medicines, repacking formulated drugs and processing bulk drugs into doses using predominantly imported active ingredients and excipients. The bulk of locally manufactured preparations are non-sterile, over the-counter (OTC) products (PWC, 2006).

1.2 Research Problem

Pharmaceutical counterfeiting is increasingly becoming a serious problem both in developed and developing countries. It is known that almost everything connected with the drug manufacture process is being counterfeited; active ingredients, dosage

forms, package inserts, packaging, manufacturers' names, batch numbers, expiry dates and documentation relating to quality control (Deisingh, 2004). Drug manufactures are therefore must adopt anti-counterfeiting strategies of detecting counterfeits as well as those strategies that will discourage counterfeiters by coming up with innovations that are hard to imitate.

Counterfeits reduce earnings of creative Kenyan businesses, compromise the health of consumers, deny government revenue and harm the credibility of the government's assurance on quality and safety of product. Additionally, counterfeits cost Kenyan small and medium enterprises (SMEs) 50 billion shillings and the government 19 billion in taxes in 2008 (KAM 2008). If the government and relevant authorities fail to counter the supply of counterfeit products in the Kenyan market, then the health of more than 40 million Kenyans will be at risk from the dangers of these products (WHO, 2003) for example counterfeit drugs for Tuberculosis and Malaria kill 700,000 people every year in Africa (Harris, Stevens & Morris, 2009). In addition to increasing the government's revenue and protecting the health of Kenyans, adoption of anti-counterfeit strategies will impact on organization performance as a whole by increasing sales of the genuine products as well as protecting the overall image of the manufacturing firm.

Several studies have been carried out in the area of counterfeit products: Lybecter (2007) studied issues on combating counterfeit medicines in developed countries. He concluded that anti-counterfeiting strategies used may not necessarily reduce the presence of counterfeit in the market but anti-counterfeit strategies that increase the cost of the counterfeiters were most effective in developing countries than educating the consumers on dangers of counterfeiting. Yomans and Law (2011) studied ways of

combating counterfeit medications a case of California pharmacists; they found out that Californians pharmacist lacked knowledge of counterfeit medication and they also faced great challenges from the new developing technologies.

Nsimba (2008) reviewed the global implication of counterfeit and substandard drugs focusing on ARVS and anti-malaria drugs. Local studies which include Thuo (1999) who carried out a study on the challenges faced by pharmaceutical firms, Njuguna (2003) who carried a study on the effect of counterfeits on the population's health depict counterfeit medicines as a significant problem, they do not highlight the existence of any operationalized anti-counterfeit strategies. The magnitude and nature of counterfeits is a critical strategic management issue that, unless arrested, could have catastrophic effects across the social strata as well as affecting the organizations profitability. This study aimed to answer the following questions; what anti-counterfeiting strategies have been adopted by pharmaceutical manufacturers in Kenya? How have these strategies impacted on organizational performance?

1.3 Research Objectives

The objectives of the study were;

i. To determine anti-counterfeiting strategies adopted by pharmaceutical manufacturers in Kenya.

ii. To establish the effect of anti-counterfeit strategies on performance of pharmaceutical manufacturers in Kenya.

1.4 Value of the Study

The study would be important to the following stake holders: The Research study would enable pharmaceuticals bring out areas of improvement and charter a new way of fighting counterfeit through better and improved anti counterfeit strategies.

The study would assist Kenyan consumers understand the dangers and risks involved in using counterfeit products, and create awareness, as people are ignorant of the magnitude of the problem especially in the food industry because it affects their health directly. Distributors and retailers would also establish the source of their products hence not only consider the price but the authenticity of the product.

The study would enable the Kenya Association of Manufacturers (KAM) being the representative body of the manufacturers be able to share this information among the members of the association and come up with strategies on how to handle this vice and enable the government to enforce heavy penalties on perpetrators from the data that would be collected showing the loss of revenue incurred due to counterfeiting.

This information would be of importance to the researchers in future as they carry out the literature review of their research work as it would contribute to the existing theory and practice.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter examined various theories that underpinned the study. It also reviewed related literature on the subject of counterfeiting and organizational performance.

2.2 Theoretical foundations

Specific theories that were reviewed for the purpose of this study were; the Open Systems Theory, Resource Based Theory and Dynamic Capabilities Theory.

2.2.1 Open Systems Theory

The open systems theory fosters the view of the interaction between the organization and environment. The interactions consist of movement of people, capital, goods and services. Kreitner (2007) argued that all firms are dynamic, evolving and changing in response to the environment. In today's turbulent environment, open systems approach is relevant and meaningful in achieving competitiveness. Organizations operate as open systems and interact with environment through permeable boundaries (Luthans, 2005).

The open systems theory has made significant contributions to the evolution and the operation of firms. Haines (1972), states that a deeper understanding of the interrelatedness of the influencing factors in the environment when applying open systems to strategic planning produces a richer and better appreciation of the sub-systems that compose the larger synergistic general system. Open systems theory provides a deeper understanding of the trends and the critical nature of the interplay between these various components with the bottom line being able to manage organizational changes, achieve an internal fit and adjust to external environmental

changes. The theory however assumes that organizational systems operate unaffected by other factors which are not environmental, this may be misleading.

2.2.2 Resource Based View

This theory is rooted in the work of Penrose (1959) who considered firms as bundles of resources. Birger Wernerfelt (1984) is a proponent of the resource based theory which stipulates that firms perform better when they assemble resources that are valuable, durable, rare, difficult to imitate, non-substitutable and superior to competitor's resources and successfully bundle them into unique capabilities which they could use to generate competitive advantage and superior performance. Wernefelt (1984) defined resources as those assets which are tied semi permanently to a firm. They are the assets a firm owns and are externally available and transferable. They include brand names, trade contacts, technology knowledge, efficient procedures and capital. Borrowing from Porter's five forces, Wernerfelt (1984) contended that entry barriers are resources since they contain mechanisms which make resource holder defensible.

Resources enable firms to achieve improved performance both in the short term and in the long term. Barney (2001) argued that firms which possessed resources that are valuable and rare would attain competitive advantage and improved performance in the short term. He contended that, for a firm to sustain competitive advantage overtime, its resources must also be inimitable and non substitutable. While extending this line of argument, Newbert (2007) posited that in addition to possessing valuable, rare, inimitable and non substitutable resources, firms seeking competitive advantage must demonstrate the ability to alter the resources in such a way that the full potential is realized.

Resource based view is useful in understanding the growth of the firm. However, it lacks substantial managerial implications. It emphasizes managerial development of the resources but is silent on how it should be done (Connor, 2002). Further it makes the illusion of total control, trivializing property rights while exaggerating the extent to which managers control resources and predict future value (McGuiness & Morgan,2002). According to Connor (2002) resource based view is relevant to large firms with significant market power. He contends that small firms cannot base survival on their static resources there by falling beyond the bounds of resource based view. By nature and scope resource based view focuses on the resources while ignoring process which transform the resources into customer value.

2.2.3 Dynamic Capabilities Theory

Teece., et al (1997) defined dynamic capabilities as the firm's ability to integrate, build and configure internal and external competencies to address rapidly changing environment. Through dynamic capabilities, firms avoid developing core rigidities, which inhibit development, generate inertia and stifle innovation (Ambrosini and Bowman, 2009). Dynamic capability theory explains why many once successful firms struggle to survive or fail completely as the environment changes due to the inability to adapt successfully. Teece., et al (1997) argued that it is not only the resources that matter but also the mechanisms by which firms learn and accumulate new skills. Dynamic capability is about the capacity of an organization to purposefully create, extend and modify its resource base (Helfat., et al 2007). Therefore dynamic capabilities are deliberate processes

The role of dynamic capability is to transform a firm's resource base in such a way that new bundles of resources are created to sustain competitive advantage. They are

shaped by positions and paths. They include coordination, integration, learning, leveraging and configuration (Helfat et al, 2007; Ambrosini and Bawman, 2009). Coordination includes aligning activities to achieve the intended output while, integration relates to the ability of the firm to combine its resources. Learning allows tasks to be performed effectively through cognition and experimentation, leveraging involves replicating processes in different units while configuration transforms and aligns firm resources.

Dynamic capabilities are processes based on value adding mechanisms within the firm. Wang and Ahmed (2007) posited that capabilities are firm's behavioral orientations to constantly integrate, reconfigure, renew and recreate its resources. Firms upgrade and reconstruct core capabilities in response to environmental changes to sustain competitive advantage. Although the notion of dynamic capabilities compliments resource based view, several issues surrounding its conceptualization remain ambivalent. The capabilities exhibit commonalities across firms, however such commonalties have not been systematically identified (Barney, 2007).

2.3 Anti-counterfeiting strategies and Organizational Performance

Pharmaceutical firms have found their innovations to face stiff challenges due to counterfeits that are flooding the markets and are made easily available to unsuspecting consumers by dubious traders. To achieve efficiency and effectiveness, the pharmaceutical manufacturers have to come up with counter measures to protect their innovations as lack of this will lead to loss of integrity for their brands as well as tremendous decrease in sales as most of the counterfeits are sold for as low as half the price of the original drugs hence prompting consumers to buy the counterfeits. Choice of anti-counterfeit strategies adopted will depend on both internal capabilities of the

firm and external factors to the environment which influence the need for anti-counterfeiting strategies. The firms might not afford to pursue all the strategies therefore priority must be established by the firm depending on the intended purpose of the strategy. The strategy chosen must also be consistent with the firm's vision, mission and objectives (Johnson and Scholes, 2009).

The anti-counterfeiting department is an integral part of each and every manufacturing firm as these strategies will enable the firms to protect their innovations and hence reap the maximum benefits from their products while they remain competitive. Implementing the anti-counterfeit strategies generates performance gain. Firms may however fail to detect the presence of the performance gains from adoption of these strategies if they fail to diagnose or mitigate the loss. It is therefore critical that each firm conducts serious evaluations to be in a position to quantify the benefits reaped from adoption of these strategies.

According to Porter, 1980, the influence of environments on firm performance has been one of the central themes in strategy. Overtime, the effectiveness of a strategy is measured to determine its success or failure which reflects on the organizations performance. Haberberg and Rieple (2008) purport that to get a full picture of a firms strategies and how well they are succeeding, demands a very hard-headed kind of analysis, which looks at actions rather than words and results and rather than intentions or opinions. What is most important is to achieve performance goals over time and sustain them. The measurement of performance over time together with an assessment of the factors that influence performance, in this case anti-counterfeit strategies, provide evidence of the sustainability of strategies and approaches adopted

by organizations. The goal of any business is not merely to achieve the performance goals which have been set but achieving them in a sustainable manner (Porter, 1985).

2.4 Measures of organizational performance

Measurement of performance is the cornerstone of business practice because it assists in evaluation of the achievement of fundamental business goals and sets the scope and direction of possible improvement actions. Measurement of performance is relative depending on the industry a business is in (Fakii, 2013). For effective performance measurement, a balanced presentation of both financial and non-financial measures is required since no single measure can provide a clear performance target or focus attention on critical areas of the business (Miller, 1988).

The balanced scorecard concept (BSC) developed by Kaplan and Norton in 1992 gives a comprehensive understanding on multiple performance measures. BSC is a model that that transforms a firm's organizational strategy to operational concepts (Kaplan and Norton, 2001; Kaplan and Norton, 1992). In the BSC model, "balance" is explained through four desired factors of the model: long and short term purposes; financial and non-financial measurements; operation and result indicators, and internal and external perspectives of the organization. The term "measurement" gets its meaning in the concise expression of Kaplan and Norton (1996) "if you cannot measure, you cannot manage".

BSC has four sub-dimensions. First, the financial performance measures are the focal point for the target and measures of the other three perspectives in BSC. Financial performance is the outcome of the operational actions. Therefore, each selected measure needs to be a part of the cause-and-effect relationship; leading to an

improvement in financial performance. These measures are factors such as sales amount, market share, new customers, new markets, cash flow and return on capital (Morrow, 1992)

Second, the customer performance measures are critical in determining organization performance as being customer-focused is one of the basic and critical value in any organization today. Specific measures reflecting factors such as timely delivery of goods and services, quality and cost should be mentioned in any company mission statement. According to Morrow, 1992, the basic factors of customer as a performance measure include, customer loyalty, gaining new customers, customer profitability, and market and customer shares in targeted scope.

Thirdly, the internal operation measures are obtained by focusing on actions and work process addressing critical success factors in empowering shareholder and customer satisfaction (Keegan et al., 1989). The most important factor in this case is the necessity of defining and evaluating an exact internal operation value chain in the phases of design and development, production and commercializing in order to create value for both customer and shareholder. The internal operation measures' of performance include, the duration spent presenting a new product to the market, number of new products, sales percentage of new products, rate of defect, duration of production, production time and just-in-time delivery.

Finally, learning and growth measures which constitute the idea that achieving the targets related with finance, customer and internal operations greatly depends on the learning and growth capability of the organization. Learning and growth measures especially address the question of what type of route should be followed in order for

internal operation methods to be improved. These measures are employee centered and focused on employee satisfaction, productivity and sustainability.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter described the research design, the population of study, the data collection procedures and techniques and how this data was analyzed.

3.2 Research Design

A research design is a plan or a blue print for the collection, measurement and analysis of data. It refers to the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in the procedure (Kothari, 2006).

The research employed a descriptive research design. Descriptive research design was appropriate because it enabled the researcher to build a profile of the phenomenon. This design is concerned with the what, where, how and when of the phenomenon. It can be used when collecting information about peoples' attitude, opinions, habits or any of the variety of educational or social issues (Orodho and Kombo, 2002). This provided an opportunity for the researcher to determine and understand the anti counterfeiting strategies adopted by pharmaceutical manufacturers in Kenya and understand the extent to which they influence performance in those organizations.

3.3 Population of the Study

Mugenda and Mugenda (1999) explain that a target population should have some observable characteristics to which the researcher intends to generate the results of the study. The population comprises the entire groups of individuals, objects, items, cases, articles or things with common attributes or characteristics existing in space at a particular point of time (Majumdar, 2005).

The study was carried out in 23 companies that were listed as pharmaceutical manufacturing firms in Kenya by the Kenya Manufacturers and exporters' 2014 directory, 10th edition. A list of the pharmaceutical manufacturers was attached as appendix i.

Since the population was relatively small, a census survey was employed. A census is often constructed as the opposite of a sample as it intends to count or collect information of everyone in a population rather than a fraction. It is commendable only when the population is small and manageable otherwise it can be very expensive and time consuming.

3.4 Data collection

Both primary and secondary data were collected. A semi-structured questionnaire was used to collect primary data. According to Mugenda and Mugenda (2003), questionnaires are commonly used to obtain important information about a population under study. The questionnaire was divided into four sections. Section A gave a summary of the respondent's demographics and firm characteristics, section B aimed to find out the anti-counterfeiting strategies adopted by the firms, section C showed the relationship that exists between adoption of counterfeiting strategies and organizational performance and section D showed the effects of counterfeits in general.

The questionnaire contained both closed and open ended questions. The closed ended questions used a five point likert scale where respondents filled according to their level of agreement with the statement. The open ended questions were used to

encourage the respondent to give an in-depth response where closed ended questions were limiting.

Choice of the likert scale was necessitated by the quality and type of information required to relate the two variables under study and make a conclusion. The researcher personally delivered and collected the questionnaires from the respondents who included either the quality assurance or quality control managers in the manufacturing firms under study as the title applies in those firms.

3.5 Data Analysis

The quantitative data obtained were first checked for errors, completeness then coded and entered in SPSS program before analysis. The data was analyzed using descriptive statistics such as frequency, percentages, mean and standard deviation. Content analysis was used in processing of qualitative data and results presented in prose form.

Since the data aimed to establish a relationship between the independent variable (anti-counterfeit strategies) and the dependent variable (performance), the measures of relations and associations, that is, correlation and regression was used. Regression analysis emphasizes estimation of an equation that describes the relationship between two variables while correlation helps to determine the strength of linear relationship that is, how strongly correlated these variables were (Mutai, 2000).

CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents analysis and findings of the study as set out in the research methodology. The results are presented on the anti- counterfeiting strategies adopted by pharmaceutical manufacturing firms in Kenya and organizational performance. The data was gathered exclusively from questionnaire as the research instrument. The questionnaire was designed in line with the objectives of the study. To enhance quality of data obtained, likert type questions were included whereby respondents indicated the extent to which the variables were practiced in a five point likert scale.

4.1.1 Response Rate

The study targeted 23 respondents who comprised of all 23 companies listed as pharmaceutical manufacturing firms in Kenya by the Kenya Manufacturers and exporter's 2014 directory, 10^{th} edition. From the study, 16 out of the 23 sampled respondents filled in and returned the questionnaire contributing to a response rate of 70% as shown by Table 4.1. This response rate was sufficient and representative and conforms to Mugenda and Mugenda (1999) stipulation that a response rate of 50% is adequate for analysis and reporting; a rate of 60% is good and a response rate of 70% and over is excellent. This commendable response rate was due to extra efforts that were made through personal calls and visits to remind the respondents to fill-in and return the questionnaires.

Table 4.1 Response Rate

Response	Frequency	Percentage
Responded	16	70
Not responded	7	30
Total	**23**	**100**

Source: Survey Data (2014)

4.2 Demographics and Firm characteristics

The study sought to ascertain the background information about the respondents involved in the study. The background information points at the respondents' suitability in answering the questions on the anti- counterfeiting strategies adopted by pharmaceutical manufacturing firms in Kenya and organizational performance.

4.2.1 Gender

On gender of respondents, the study found that there were more males as shown by 74% than females shown by 26%. This shows that both genders were represented in the study however there was gender disparity. This is depicted in Table 4.2 below.

Table 4.2 Gender

Gender	Frequency	Percentage
Male	17	74
Female	6	26
Total	**23**	**100**

Source: Survey Data (2014)

4.2.2 Work Experience

The study sought to determine the number of years the respondents had been working in the organization, 46% who were the majority had worked for a period between 1 to 5 years, 22% had worked for a period between 6 to 10 years, 14% had worked for a

period between 11 to 15 years while 9% had worked for a period of less than one year and over 15 years as shown in Table 4.3. These findings show that the respondents had vast knowledge of the organization.

Table 4.3 Number of Working Years

Number of years	Frequency	Percentage
Less than one year	2	9
1-5 years	11	46
6-10 years	5	22
11-15 years	3	14
Over 15 years	2	9
Total	**23**	**100**

Source: Survey Data (2014)

4.2.3 Experience in current position

The study sought to evaluate the number of years respondents had held their current positions, 48% who were the majority had held for a period between 1 to 5 years, 25% had held for a period between 5 to 10 years, 21% had held for a period below 12 months while 6% had held for a period of over 10 years as depicted in Table 4.4. This depicts that the respondents were aware of the organization operation.

Table 4.4 Experience

Number of Years	Frequency	Percentage
Below 12 months	5	21
Between 1-5 years	11	48
Between 5-10 years	5	25
Over 10 years	2	6
Total	**23**	**100**

Source: Survey Data (2014)

4.3 Anti-counterfeit Strategies Adopted by pharmaceutical companies

4.3.1 Anti-counterfeit Strategies

The study sought to determine the implementation of anti-counterfeit strategies in the respondents firms, the findings are contained in table 4.5.

Table 4.5 Anti-counterfeit Strategies

Anti-counterfeiting strategies	Mean	Std.dev
Embossed optical films	3.71	.931
Holograms	4.02	.242
High resolution printing	3.93	.491
Colour shift-inks	2.91	.572
Taggants	3.47	.886
Radio frequency identification devices (RFID)	2.85	.612
Bar codes	3.88	.131

Source: Survey Data (2014)

The following anti-counterfeit strategies' were adopted to a great extent; holograms as shown by a mean score of 4.02, high resolution printing with a mean score of 3.93, bar codes with a mean score of 3.88 and embossed optical films with a mean score of 3.71. Others had been implemented to a moderate extent such as, taggants with a mean score of 3.47, colour shift-inks with a mean score of 2.91 and radio frequency identification devices (RFID) as shown by a mean score of 2.85.

This shows that the firms had adopted Johnson and Scholes (2009) recommendations in that to achieve efficiency and effectiveness, the pharmaceutical manufacturers have to come up with counter measures to protect their innovations as lack of this will lead to loss of integrity for their brands as well as tremendous decrease in sales as most of

the counterfeits are sold for as low as half the price of the original drugs hence prompting consumers to buy the counterfeits.

4.3.2 Other Anti-counterfeit Strategies

The study sought to find out other anti-counterfeit strategies adopted. Respondents indicated that a toll free message system known as Hakikisha Dawa had been adopted, where customers' bought drugs and scratched to reveal a hidden code which was sent to confirm whether the production was genuinely packed or not. These findings were in line with Barney (2007) the anti-counterfeiting department is an integral part of each and every manufacturing firm as these strategies will enable the firms to protect their innovations and hence reap the maximum benefits from their products while they remain competitive.

4.4 Anti-counterfeit Strategies and Organization Performance

4.4.1 Anti-counterfeit Strategies on Organization Performance

The study sought to evaluate how adoption of anti-counterfeit strategies had led to improved organization performance, according to table 4.6; increased brand loyalty improved organization performance to a great extent as shown by a mean score of 4.09, high level of customer satisfaction improved organization performance to a great extent as shown by a mean score of 4.07, increased return on investments improved organization performance to a great extent as shown by a mean score of 3.99, high productivity growth improved organization performance to a great extent as shown by a mean score of 3.91, increased market share improved organization performance to a great extent as shown by a mean score of 3.85, positive cash flow (profitability) improved organization performance to a great extent as shown by a

mean score of 3.71 and low production/operation costs improved organization performance to a moderate extent as shown by a mean score of 2.96. The finding shows that anti-counterfeit strategies indeed influenced organization performance and this was through enhanced high level of customer satisfaction.

Table 4.6 Anti-counterfeit Strategies and Organization Performance

Organization Performance variable	**Mean**	**Std.dev**
Positive cash flow (profitability)	3.71	.539
Increased market share	3.85	.107
Increased return on investments	3.99	.973
High level of customer satisfaction	4.07	.252
Low production/operation costs	2.96	.721
High productivity growth	3.91	.364
Increased brand loyalty	4.09	.637

Source: Survey Data (2014)

The study findings correlated with Haberberg and Rieple (2008) findings in that by implementing the anti-counterfeit strategies there is performance gain. Firms may however fail to detect the presence of the performance gains from adoption of these strategies if they fail to diagnose or mitigate the loss. It is therefore critical that each firm conducts serious evaluations to be in a position to quantify the benefits reaped from adoption of these strategies.

4.4.2 Other ways that counterfeit strategies influence performance

The study aimed at determining other ways in which adoption of anti-counterfeit strategies improved organization performance, respondents indicated that there was increased confidence among the healthcare professionals and patients about the authenticity of the quality of products. The study correlated with Johnson and Scholes (2009) recommendations in that the firms might not afford to pursue all the strategies

therefore priority must be established by the firm depending on the intended purpose of the strategy and that the strategy chosen was consistent with the firm's vision, mission and objectives.

4.4.3 Percentage Increase in Sales

The study sought to investigate the percentage increase in sales achieved as a result of adoption of the anti-counterfeiting strategies, respondents indicated that there was an average increase in sales of between 10% - 12% compared to the previous years. These may be as a result of Johnson and Scholes (2009) findings in that to achieve efficiency and effectiveness, the pharmaceutical manufacturers have to come up with counter measures to protect their innovations as lack of this will lead to loss of integrity for their brands as well as tremendous decrease in sales as most of the counterfeits are sold for as low as half the price of the original drugs hence prompting consumers to buy the counterfeits.

4.4.4 Percentage Decrease in Counterfeit cases

The study aimed at determining the percentage decrease in counterfeit cases as a result of adoption of the anti-counterfeit strategies, respondents indicated that counterfeit cases had decreased greatly due to adoption of anti-counterfeit strategies. Effectiveness of the reactions to counterfeit incidents is not valuable in preventing future crimes therefore a proactive intervention is necessary. It is therefore important to establish that anti-counterfeit strategies must be based on understanding the nature of the fraud and the fraudster (Spink, 2011).

4.5 Effects of Counterfeits

The study aimed at determining the effects of counterfeits, respondents indicated that, counterfeits affected innovation to a great extent as shown by a mean score of 4.22, counterfeits caused loss of goodwill of the brand to a great extent as shown by a mean score of 4.01, counterfeits led to loss of investors investments to a great extent as shown by a mean score of 3.93, counterfeits affected the performance of the firm as a whole to a great extent as shown by a mean score of 3.90, counterfeits led to loss of revenue to the government to a great extent as shown by a mean score of 3.83, presence of counterfeits affected the firms sales to a great extent as shown by a mean score of 3.69, counterfeits could cause death to a great extent as shown by a mean score of 3.66 as shown in Table 4.7 below. The study findings show that the counterfeits effects are immense both to the company by affecting performance in terms of sales as well as the consumers which even leads to premature deaths.

Table 4.7 Effects of Counterfeits

Statements	Mean	Std.dev
Presence of counterfeits affects the firms sales	3.69	.543
Counterfeits cause loss of goodwill of the brand	4.01	.298
Counterfeits lead to loss of investors investments	3.93	.901
Counterfeits can cause death	3.66	.352
Counterfeits affects innovation	4.22	.730
Counterfeits affect the performance of the firm as a whole	3.90	.195
Counterfeits lead to loss of revenue to the government	3.83	.442

Source: Survey Data (2014)

These findings were similar with Muthiani (2012) and Grossman and Sharpiro (2008) in that the presences of counterfeit in the market affect the pharmaceutical business. It affects the brand value and reputation of the manufacturing company. Innovation used

by such companies and firms is also affected since they have to invest more on their research and development for them to remain competitive in the market. Counterfeiting affects the pharmaceutical business on sales volume and prices, brand value, pharmacy reputation, royalties, firm level of investment and cost of operations.

4.6 Regression Analysis of the Findings

As shown in table 4.8 the researcher conducted a multiple linear regression analysis so as to determine the relationship between the factors affecting organizational performance and anti-counterfeit strategies.

Table 4.8 Model Summary

Model	**R**	**R Square**	**Adjusted R Square**	**Standard Error of the Estimate**
1	**0.843**	**0. 742**	**0.724**	**0.4216**

a) Predictors: (Constant), Anti-counterfeit strategies
b) Dependent variable: Organizational performance

The study used the R square. The R Square is called the coefficient of determination and tells us how the organizational performance varied anti-counterfeit strategies. The independent variables that were studied explain 74.2% of the factors affecting organizational performance as represented by R Squared (Coefficient of determinant). This therefore means that other factors not studied in this research contribute 25.8% of the factors affecting organizational performance.

Table 4.9 ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.72	7	1.302	44.231	.000(a)
	Residual	3.432	9	0.066		
	Total	**15.152**	**16**			

a) Predictors: (Constant), Anti-counterfeit strategies
b) Dependent Variable: organizational performance

The study used ANOVA as depicted in Table 4.9 to establish the significance of the regression model from which an f-significance value of p less than 0.05 was established. The model is statistically significant in predicting how embossed optical films, high resolution printing, taggants and Radio frequency identification devices (RFID) which are anti-counterfeits strategies affect organizational performance. This shows that the regression model has a less than 0.05 likelihood (probability) of giving a wrong prediction. This therefore means that the regression model has a confidence level of above 95% hence high reliability of the results.

Table 4.10 Coefficients Results

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.116	.186		0.623	.535
Embossed optical films	0.577	.068	.559	8.478	.000
High resolution printing	0.157	.043	.257	3.676	.036
Taggants	0.082	.042	. 301	2.252	.020
Radio frequency identification devices (RFID)	0.021	.002	.245	6.906	.001

a) Predictors: (Constant), Radio frequency identification devices (RFID)
b) Dependent Variable: Organizational performance

The established regression equation was

$$Y = 0.116 + 0.577X_1 + 0.157X_2 + 0.082X_3 + 0.021X_4 + \varepsilon$$

The regression equation in Table 4.10 above has established that holding all factors (embossed optical films, high resolution printing, taggants and Radio frequency identification devices (RFID)) constant, factors affecting organizational performance will be 0.116. The findings presented also shows that taking all other independent variables at zero, a unit increase in embossed optical films will lead to a 0.577 increase in the scores of the organizational performance. A unit increase in high resolution printing will lead to a 0.157 increase in organizational performance. On the other hand, a unit increase in taggants will lead to a 0.082 increase in the scores of the organizational performance; and a unit increase in Radio frequency identification devices (RFID) will lead to a 0.021 increase in the scores of the organizational performance. This infers that embossed optical films influences the organizational performance most followed by taggants, high resolution printing and then Radio frequency identification devices (RFID). The study also established a significant relationship between organizational performance and the independent variables; embossed optical films ($p=0.00<0.05$), high resolution printing ($p=0.036<0.05$), taggants ($p= 0.20<0.05$) and Radio frequency identification devices (RFID) ($p=0.001<0.05$) as shown by the p values. The researcher dropped the regression model because $p>0.5$ and $t<1.96$.

4.7 Non-parametric correlation

A Spearman correlation is used when one or both of the variables are not assumed to be normally distributed. The values of the variables were converted in ranks and then correlated. The study correlated embossed optical films, high resolution printing, taggants and the Radio frequency identification devices (RFID) under the assumption that both of these variables are normal and interval.

Table 4.11 Correlations

			Embossed optical films	High resolution printing	Taggants	Radio frequency identification devices (RFID)
Spearman's rho	Embossed optical films	Correlation Coefficient Sig. (2-tailed) N	1.000 . 16	.617 .000 16	.547 .000 16	.667 .000 16
	High resolution printing	Correlation Coefficient Sig. (2-tailed) N	.617 .000 16	1.000 . 16	.437 .000 16	.235 .001 16
	Taggants	Correlation Coefficient Sig. (2-tailed) N	.547 .000 16	.437 .000 16	1.000 . 16	.441 .002 16
	Radio frequency identification devices (RFID)	Correlation Coefficient Sig. (2-tailed) N	.667 .000 16	.235 .000 16	.441 .000 16	1.000 . 16

The results in Table 4.11 suggest that the relationship between embossed optical films and high resolution printing (rho = 0.617, p = 0.000) is statistically significant. Embossed optical films and taggants had a rho of 0.547 and a p value of 0.000 therefore denoting statistical significance. Similarly, the embossed optical films and Radio frequency identification devices (RFID) posted a rho of 0.667 with a p value of 0.000 therefore providing a statistical significance. High resolution printing and taggants had a rho of 0.437, p=0.000 further pointing to a statistical significance. On the same note, the high resolution printing and the Radio frequency identification devices (RFID) correlated at rho=0.235 and p=0.001. This therefore is statistically significant. Finally, the taggants and Radio frequency identification devices (RFID) stood at a correlation of rho=0.441 and p= 0.002 revealing statistical significance.

These findings were similar to Porter (1985) as well as a current study by Fakii (2013) study who asserts that with measurement of performance over time together with an assessment of the factors that influence performance, in this case anti-counterfeit strategies, provides evidence of the sustainability of strategies and approaches adopted by organizations. The goal of any business is not merely to achieve the performance goals which have been set but achieving them in a sustainable manner.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter provides the summary of the findings from chapter four. It also gives the conclusions and recommendations of the study based on the objectives of the study. The objectives of this study were to determine anti-counterfeiting strategies adopted by pharmaceutical manufacturers in Kenya and to establish the effect of anti-counterfeit strategies on performance of pharmaceutical manufacturers in Kenya.

5.2 Summary

The study found out that the respondents firm had implemented anti-counterfeit strategies in the following ways, holograms, high resolution printing, bar codes and embossed optical films to a great extent. It also found out that another anti-counterfeit strategy was adopted by most firsm; a toll free message system known as Hakikisha Dawa where customers' bought drugs and scratched to reveal a hidden code which was sent to confirm whether the production was genuinely packed or not.

The study also found out that adoption of anti-counterfeit strategies had led to improved organization performance, increased brand loyalty to a great extent, high level of customer satisfaction to a great extent, increased return on investments to a great extent, high productivity growth to a great extent, increased market share to a great extent, positive cash flow (profitability) to a great extent. It also found that adoption of counterfeits strategies led to increased confidence among the healthcare professionals and patients about the clarification of quality of products. It also found that there was a 10-12 percentage increase in sales achieved as a result of adoption of the anti-counterfeiting strategies as compared to the previous years. There was also a

significant decrease in counterfeit cases as a result of adoption of the anti-counterfeit strategies.

The study further found out the extent to which respondents agreed with the statements on effects of counterfeits; counterfeits affected innovation to a great extent, counterfeits caused loss of goodwill of the brand to a great extent, counterfeits led to loss of investors investments to a great extent , counterfeits affected the performance of the firm as a whole to a great extent, counterfeits led to loss of revenue to the government to a great extent, presence of counterfeits affected the firms sales to a great extent and counterfeits could cause death to a great extent.

5.3 Conclusion

The study concludes that the adoption of anti-counterfeit strategies led to increased brand loyalty, high level of customer satisfaction, increased return on investments, high productivity growth, increased market share, positive cash flow (profitability) and increased confidence among the healthcare professionals and patient which all led to improved organization performance. The independent variables that were studied explain the factors affecting organizational performance as represented by R Squared (Coefficient of determinant). This therefore means that other factors not studied in this research contribute 25.8% of the factors affecting organizational performance.

The study further concludes that taking all other independent variables at zero, a unit increase in embossed optical films will lead to an increase in the scores of the organizational performance. A unit increase in high resolution printing will lead to an increase in organizational performance. On the other hand, a unit increase in taggants will lead to an increase in the scores of the organizational performance; and a unit

increase in Radio frequency identification devices (RFID) will lead to an increase in the scores of the organizational performance. This infers that embossed optical films influences the organizational performance most followed by taggants, high resolution printing and then Radio frequency identification devices (RFID). The study also established a significant relationship between organizational performance and the independent variables; embossed optical films, high resolution printing, taggants and Radio frequency identification devices (RFID) as shown by the p values

5.4 Recommendations for Policy and Theory

From the above conclusions the study recommends that the manufacturing firms should clearly understand the effects of counterfeit drugs and the consequences of such drugs to their business and to the patient who end up consuming the counterfeited drugs. The institutions should train the employee's on the anti-counterfeiting techniques applied by these original branded products and work closely with the Kenya Intellectual Property Institute to avoid IPR infringement by the counterfeiters.

Further all cases of counterfeiting should be reported to regulatory authorities for action. The pharmaceutical firms should further consider educating the public on the effects of counterfeit drugs and the anti-counterfeiting techniques that are applied so that they can be able to identify the original brands.

5.5 Limitations of the Study

A few limitations encountered during this study included resistance from some firms who said that they do not allow collection of data from outsiders for whatever reasons. Secondly, some firms' location was inaccessible hence making it very difficult for the researcher to get to them.

5.6 Suggestions for Further Research

Since the business environment is dynamic and presents new challenges and opportunities, it will be important to replicate this study after duration of five years and establish the position as at that time. This study should be compared with findings from other sectors in order to establish the similarities and differences that may be evident. This will assist the manufacturing firms to benchmark with other sectors. Other research tools such as interview guides as well as focus group discussion should also be used in order to compare results.

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APPENDICES

Appendix I: List of Pharmaceutical Manufacturing firms in Kenya

Alpha Medical Manufacturers

Aventis Pasteur East Africa

Bayer East Africa Ltd

Beta Healthcare (Shelys pharmaceuticals)

Cosmos Ltd

Dawa Pharmaceuticals Ltd

Didy Pharmaceutical

Diversey Lever

Eli Lilly (Suisse) SA

Elys Chemical industries Ltd

Glaxo Smith Kline

High Chem East Africa Ltd

Ivee Aqua EPZ Ltd (Athi River)

Mac's Pharmaceutical Ltd

Manhar Brothers (Kenya) Ltd

Novartis Rhone Poulenic Ltd

Novelty Manufacturers Ltd

Pfizer Corp (Agency)

Pharmaceutical manufacturing Co (K) Ltd

Pharmaceutical Products Ltd

Phillips Pharmaceutical Ltd

Regal Pharmaceutical Ltd

Universal Pharmaceutical Ltd

Source: Kenya Manufacturers and Exporters 2014 Directory. 10th Edition

Appendix II: Questionnaire

Instructions

Kindly read the questions below and give your answers by ticking [√] against the statement you agree with or by giving your views on the space provided. This will be of great help in my academic research. Information provided will be treated with confidence.

Section A: Demographics and Firm characteristics

Name of firm……

Location……

Name of the respondent (optional)…….

1. Gender

   Male [ ]

   Female [ ]

2. How long have you been working with the firm?

   Less than one year [ ]

   1-5 Years [ ]

   6-10 Years [ ]

   11-15 Years [ ]

   Over 15 Years [ ]

3. What position do you hold in the firm?

   …….

5. How long have you been in your current position?

   Below 12 months [ ]

   Between 1 – 5 years [ ]

   Between 5 – 10 years [ ]

   Over 10 years [ ]

Section B: Anti-counterfeit strategies adopted by the firm

1. Indicate the extent to which your firm has implemented the following anti-counterfeit strategies. Using a 5 point scale below please tick (√) appropriately against each anti-counterfeit strategy. The scale stands for the following: 1= No extent; 2= Small extent; 3= Moderate extent; 4= Great extent; 5= Very great extent

No	**Anti-counterfeiting strategies**	**1**	**2**	**3**	**4**	**5**
1	Embossed optical films					
2	Holograms					
3	High resolution printing					
4	Colour shift-inks					
5	Taggants					
6	Radio frequency identification devices (RFID)					
7	Bar codes					

1. What other anti-counterfeit strategies (that might not be listed above) has your firm adopted (if any)?

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Section C: Anti-counterfeit strategies and organization performance

1. Indicate the extent to which adoption of anti-counterfeit strategies has led to improved organization performance considering the variables below. Using a 5 point scale below please tick (√) appropriately against each organization performance variable. The scale stands for the following: 1= No extent; 2= Small extent; 3= Moderate extent; 4= Great extent; 5= Very great extent

No.	Organization Performance variable	1	2	3	4	5
1	Positive cash flow (profitability)					
2	Increased market share					
3	Increased return on investments					
4	High level of customer satisfaction					
5	Low production/operation costs					
6	High productivity growth					
7	Increased brand loyalty					

2. What other ways (not listed above) has adoption of anti-counterfeit strategies influenced performance in your organization?

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3. What is the percentage increase in sales achieved as a result of adoption of the anti-counterfeiting strategies?

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   …....

4. What is the percentage decrease in counterfeit cases as a result of adoption of the anti-counterfeit strategies?

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   …

Section D: Effects of counterfeits

1. Indicate the extent to which you agree or disagree with the statements below by ticking (√) in the box.

No.	Statements	Strongly Disagree	Slightly Disagree	Not sure	Slightly Agree	Strongly Agree
1	Presence of counterfeits affects the firms sales					
2	Counterfeits cause loss of goodwill of the brand					
3	Counterfeits lead to loss of investors investments					
4	Counterfeits can cause death					
5	Counterfeits affects innovation					
6	Counterfeits affect the performance of the firm as a whole					
7	Counterfeits lead to loss of revenue to the government					

Thank you for your participation.