# IMPLICATIONS OF TECHNOLOGICAL ADVANCEMENT ON PERFORMANCE OF POLICE OFFICERS; CASE OF KENYA RAILWAYS POLICE UNIT.

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**A RESEARCH PROJECT SUBMITTED TO THE SCHOOL OF SECURITY, DIPLOMACY AND PEACE STUDIES IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF SECURITY MANAGEMENT AND POLICE STUDIES OF KENYATTA UNIVERSITY**

**MARCH, 2019**

## DECLARATION

This is my original work and has not been presented to any other university or institution for an award of a degree.

Signature …….. Date……..

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**Declaration by the Supervisor**

This proposal has been submitted for examination with my approval as the university supervisor

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

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## DEDICATION

This project is dedicated to my loving husband and son, Crispus Ngila and Osteen Zawadi.

## ACKNOWLEDGEMENT

First and foremost I thank God for the life and opportunity he has given me.

I also want to express my gratitude to my Employer, The National Police Service for permitting me to pursue a Master's degree in Security Management and Police Studies.

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## ABREVIATIONS

| | |
|---|---|
| **ATM** | Automated Teller Machine |
| **CCTV** | Closed Circuit Television |
| **DNA** | Deoxyribonucleic Acid |
| **IC3** | Internet Crime Complaint Centre |
| **IT** | Information Technology |
| **NIJ** | National Institute of Justice |
| **PERF** | Police Executive Research Forum |
| **PC** | Personal Computer |
| **UNODOC** | United Nations Office on Drugs and Crime |

## ABSTRACT

Although technology holds great promise for improving policing, research on police technology is not well developed and raises questions about technology's impacts on policing. The purpose of this study was to assess the implications of technological advancements on performance of police officers and suggest the best ways to enhance technology use in the Kenya Police Service. Objectives of the study were to establish the prevalence and use of new technology in the Kenya Police Service, to examine the types of technology used in the Kenya Police Service, to identify challenges that Kenya Police Officers face in the use of new technologies, to examine effects of technology on the performance of Kenya Police Officers and to find out the best strategies to help Kenyan Police Officers adopt new technologies to enhance their performance. The study adopted the postmodern theory of technology by John Watkins Chapman. The study adopted a descriptive research design survey where it targeted 1700 police officers, who formed the target population of this study. A total of 170 police officers formed the sample size. The sampling techniques used were simple random sampling for junior police officers followed by purposive sampling technique for senior police officers. Raw data from respondents was obtained using questionnaires, interviews and focused group discussions. The qualitative data was analyzed thematically and by looking for patterns. They were presented in the form of narrative and verbatim quotations. Quantitative data was analyzed using descriptive statistics includes percentages and means. They were presented in tables, graphs and pie charts. The findings will help enhance the usage of new technological advancements in improvement of the performance of our officers. The study discovered the performance of police officers has greatly improved due to advancement of technology. The study established that there was use of technology in Kenya police service though not very much advanced. It also established that Globalization and new technologies have facilitated certain cyber-criminal operations, thereby placing an additional burden on law enforcement agencies. Fifty two percent of the respondents noted that lack of funds to acquire updated equipment was a major challenge facing police officers in their effort to adopt new technology. The study found out that, due to fast technological advancements, the digital forensic tools become obsolete too often. Forty percent of the respondents had the view that this has become a major challenge because they are expensive and the budget allocation to acquire them is limited. Unemployment of techno-savvy personnel was seen as a major challenge in adopting technology in Kenya police service. Fifty four percent of the respondents cited that in the recruitment of police officers not much consideration is given to the courses one undertook in the case of graduates. The study recommends that the government of Kenya should increase the allocation of funds to the National Police Service for the acquisition of updated equipment, to provide training at appropriate levels in forensic techniques and in technological skills for policy makers and law enforcement and investigative personnel, introduce appropriate procedural and substantive laws to deal with crimes committed in an electronic environment and raise public awareness, on the appropriate use of the internet.

## DEFINITION OF TERMS

**Advancement :** Progression to a higher stage of development

**Closed Circuit Television**: A television system in which video signals are transmitted from one or more cameras by cable to a set of monitors, used especially for security purposes.

**New technologies:** .New technologies that are currently developing or will be developed over the next five to ten years, and which will substantially alter the business and social environment. These include information technology, wireless data communication, man-machine communication, on-demand printing, bio-technologies, and advanced robotics.

**Performance:** The accomplishment of a given task measured against preset known standards of accuracy, completeness, cost and speed.

**Police :** A body of government employees trained in methods of law enforcement and crime prevention and detection and authorized to maintain the peace, safety, and order of the community.

**Policing:** To regulate, control, or keep in order with a law enforcement agency

**Technology:** The application of scientific knowledge for practical purposes.

**Gender stereotyping:** Practice of ascribing to an individual woman or man specific attributes, characteristics or roles on the sole basis of her or his membership of the social group of women or men

# CHAPTER ONE

# INTRODUCTION

## 1.1 Background of the study

Over the past several decades, there have been dazzling technological innovations that seem to occur with ever-increasing speed all over the world (NIJ 1998). According National Institute of Justice, Systematic photography for criminal identification was first used in San Francisco in the late 1850's. Police use of telegraph began in Albany, New York, in 1877, one year later; in 1878 the telephone was used in police private grounds in Washington, DC. In 1901, Scotland Yard adopted a fingerprint identification system. This facilitated identification of criminals. In 1923, the first police crime laboratory in the United States was established by the Los Angeles Police Department and the teletype machine was inaugurated by the Pennsylvania state police and this helped in investigating crimes. Detroit police began using the one way radio in 1928, Boston police began using the two-way radio in 1934, in 1930, the prototype of the present day polygraph was developed, and radar was introduced to traffic law enforcement in 1948. In 1955, the New Orleans police department was one of the first departments in the country to install an electronic data processing machine and this had a great impact on communication (National Institute Of Justice, 1994).

Use of computers, finger print reader, internet, wireless computers cell phones and global positioning systems are other advancements that have been discovered. The introduction of the telegraph in the late nineteenth century and the utilization of two-way radios, engine vehicles and PC supported dispatching amid the twentieth century have achieved sensational changes in the association of police work and, with them, new public desires for police administrations. This is the reason behind why individuals expect that the most recent round of technological change will have a similarly significant effect on policing (National Institute Of Justice, 1994).

Advances in innovation have been a blended gift for contemporary law implementation organizations. Take the dangerous spread of Internet access over the last several decades, for instance. Regular advances like online networking and different applications have

made it possible for groups and even terrorist based gangs associations to organize, making a completely new, computerized space that requires policing (National Institute Of Justice, 1994).

Social media is not the main innovation that has drawn concern from police. Numerous in the law enforcement network have especially referred to Waze, a movement following application that shows the present area of cops, as conceivably permitting those with criminal plan to maintain a strategic distance from (or search out and hurt) law requirement officers. While this unquestionably confuses crafted by keeping the general population safe, criminals utilizing the Internet, whatever they utilize it for, regularly abandons a trail. With the best possible learning and instruments on their side, law requirement officers can utilize this extensive channel of correspondence against potential or suspected criminal guilty parties. The Internet has turned into an expansive trap of shared individual data that remaining parts allowable as proof when accomplished legitimately; making a natural database of recorded practices that can give one of a kind knowledge into each case. Whenever dissected, this information can even be valuable in distinguishing criminal patterns and foreseeing dangers (Koper, 2009).

Police are being entrusted with an undeniably muddled test as the state of innovation advances, however the present best officers aren't precisely lacking in technical muscle. A similar fast development of innovation driving brisk adjustment with respect to police has set the phase for energizing, imaginative tech that enables officers to serve their networks. Law implementation officers around the nation have perceived the estimation of these apparatuses, utilizing them to meet the moving requests of police work. Some are still generally untested, others are dubious, yet each new deadly implement in the battle against wrong doing can possibly profoundly modify the manner in which law requirement works (Koper, 2009).

As per the 2013/2014 crime statistics reports, South Africa has a high crime rate recorded at 47 kills daily. Greater Mayfair Safety and Security (GMMS) that watches the Mayfair rural areas in Johannesburg has detailed wrong doing decay and capture of numerous crooks since the presentation of Whatsapp and BBM Messages as a method for revealing violations and suspicious episodes. Inhabitants have communicated a great deal of

thankfulness for the presentation of these applications as a way to guarantee security on the zone as the reaction to wrong doing exercises by the police and security organizations has expanded and occupants are more vigilante (Crime statistics report, 2013/2014).

South Africa's City Center has additionally encountered the equivalent extraordinary fall in crime rate since the presentation of CCTV cameras in the city. The CCTVs have reduced violent muggings, cash-in-transit heists, bank burglaries and other violent crimes in what used to be the most risky city in South Africa. Organizations have since turned out to be protected attributable to the more than 240 cameras covering all boulevards, 'Wrongdoing Line'; a mysterious wrong doing tip-off administration and in addition SMS informing wrongdoing revealing. The utilization of long range informal communication applications and being the main nation to present SMS messages wrong doing revealing has helped South Africa significantly diminish the wrong doing rate, capture offenders and recoup millions worth of stolen products. The activity being unique enhances the network policing and carefulness in battling and diminishing wrong doing and in addition collaboration in securing offenders (Crime statistics report 2013/2014).

Kumbuti, 2013, found that in Nairobi city information and communications technology (IT) has upset the manner, in which individuals live, learn, work and cooperate. As crime and criminal exercises have turned out to be more refined and new patterns in crime designs have developed, law enforcement organizations have reacted by upgrading their gear and technologies. She found out that Kenya police service has not adopted the latest technological advancement in crime prevention. Kenya police service hardly use soft technologies which enable strategic use of information to prevent crime. They use personal mobile phones and walkie-talkies as the main communication equipment in crime prevention (kambuti, 2013). Simple things like occurrence books are still kept in hard copies instead of being in soft copies which may be retrieved anywhere and easily. At times criminals are taken to courts and the occurrence book reports are missing delaying the dispensation of justice.

### 1.2 Statement of the Problem

Technological advancements have molded policing in numerous essential ways throughout the years. One needs just to consider that the essential police technique for a

significant part of the twentieth century, mechanized preventive watch and fast reaction to calls for administration was created because of the development of the vehicle, two-way radio communications, and Personal computers supported dispatch frameworks. In recent decades, there have been numerous essential advancements regarding data advances (IT), scientific frameworks, video surveillance frameworks, tag pursuers, deoxyribonucleic corrosive testing innovations that have had broad impacts on police offices. (DNA), and different (Mullen 1996).

Kenya police service has attempted to ensure that police officers are prepared on new technologies. For example, recruits at Kenya Police College have access to computer where they are instructed on the essentials of personal computer technology. Kenya police benefit has likewise purchased Personal Computers for a few stations, new vehicles, and present day weapons to distinguish and deflect crime, yet notwithstanding these endeavors, they have not possessed the capacity to control all the innovation related crimes. Kenya Police Officers are constantly being confronted by the ever advancing and increasingly sophisticated nature of new technology. Simple things like occurrence books are still kept in hard copies instead of being soft copies which can be retrieved anywhere and easily. It is against this background that this study wanted to find out the implications of technological advancements on the performance of police officers.

### 1.3. Purpose of the study

To evaluate the implications of technological advancement on performance of police officers of Railways Police Unit and recommend the most ideal approaches to upgrade technological use in the police benefit.

### 1.4 Objectives

a) To establish the preference and use of new technology in the Kenya Police Service

b) To examine the types of technology used in the Kenya Police Service

c) To identify challenges that Kenyan police officers face in the use of new technologies

d) To examine effects of technology on performance of police officers

**e)** To identify the best strategies of helping Kenyan police officers adapt new technologies to improve their performance

### 1.5. Research questions/hypotheses

a) To what extent is the prevalence and use of new technologies in the Kenya police service?

b) What are the types of technology used in the Kenya Police Service?

c) What are the challenges faced by Kenyan police officers in the use of new technology?

d) What is the effect of technology use on performance of police officers?

e) What are the best strategies to help Kenyan police officers adapt new technology to improve their performance?

### 1.6 Assumptions

The researcher assumes that; Kenya Police Service is using new technology to some extent, there are different types of technology used in Kenya police service, there are challenges that Kenya police officers face in the use of new technology, there are effects of technology use in Kenya police service and there exist strategies that can help Kenya police officers adapt new technology to improve performance.

### 1.7 Justification and Significance of the study

Crime is no longer as effectively traceable and solidly characterized as it once seemed to be. With advancements in technology over the recent years, many developing countries, including Kenya have seen the development of technological crime. Kenya is encountering a developing number of digital crimes that jeopardize national security, Information, communications and technological frameworks and residents' protection (Kenya cyber security report 2014).

The nation is losing an expected 2 billion shillings every year through cyber-crime as indicated by Kenya digital security report 2014. Today, cyber criminals that indulge digital in violations are not driven by ego or aptitude. Rather, they need to utilize their knowledge to gain benefits fast. They are utilizing their mastery to take away, beguile

and misuse individuals as they think that it's simple to acquire cash without doing a decent living. These revelations created a compelling reason for a study to be carried out. The study found out how officers are faring on with new technological innovations to curb crime (Kenya cyber security report 2014).

The law enforcers and the general citizenry are likely to benefit from the study if the Government of Kenya increases the allocation of funds to the National Police Service for the acquisition of updated equipment, provides training at appropriate levels in forensic techniques and in technological skills for policy makers and law enforcement and investigative personnel, appropriate procedural and substantive laws are introduced to deal with crimes committed in an electronic environment and public awareness on the appropriate use of the internet is done. The crime will greatly reduce and the work of law enforcers would be easier as they will be at par with the changing technology.

### 1.8 Scope and Limitations of the study

The study was carried out at Kenya Railways Police Unit. Railways police unit is a unit within the Kenya police service. It is divided into six divisions namely Nairobi division, Nakuru division, Nairobi terminus division, Mtito andei division, Mombasa terminus division and Kilindini port police division. The researcher confronted impediments regarding defensive societies of police functions where data is deemed as delicate and dreaded that it might be abused. However the analyst guaranteed the authorities that the study was for academic purposes only and it would likewise aid the improvement of knowledge around there. It would likewise help with getting the best techniques around there. The researcher also faced resources constraints as collection of data needed a lot of money for travelling, printing questionnaires as well as internet access. The researcher had also time constraints but through support given by the employer it was possible (Kenya Railways Annual Report, 2017).

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Introduction

The researcher reviewed literature or work done by other researchers related to the technological advancement and its implications on performance of police officers. This chapter focused on four main areas namely; prevalence and use of new technology in the Kenya police service, the types of technology used in the Kenya police service, identifying challenges that Kenyan police officers face in the use of new technologies and effects of technological advancement on performance of Kenya police officers. The researcher endeavored to find out any other related areas during the study. It also looked at the themes that are related to its objectives. The study looked at theoretical framework and the conceptual framework.

## 2.2 Prevalence and use of new technology in policing

The utilization of information technology has become part of everyday life in the twenty first century for some people and by far most of the institutions. It was, thusly, not amazing that a national study of US city police offices in the mid-1990s found that just around 6 percent did not have an in-house PC framework (Mullen 1996). Australian police force, being commonly significantly bigger than American ones, have all embraced some type of broad mechanized data framework since the mid-1990s. The subject of whether the substantial scale appropriation of data innovation has changed police activities, administration practices and open administration was an imperative one. Technology absolutely has the capacity to enhance proficiency and improve service. Unfortunately, there has not been very many research thinks on the effect of information technology on policing (Mullen 1996).

Alternate perspectives views have risen up out of the accessible writing on the degree to which data innovation has changed police practices. One view recommends that information technologies 'have been obliged by the conventional structure of policing and by the customary job of the officer's (Manning 2001). Drawing on assessment considers distributed in the 1980s (e.g Rheinier et al. 1979; Chaiken et al. 1975; Hough 1980a). Manning delineated the frustrating consequences of different technological innovations,

for example, computer-aided dispatch (CAD) frameworks, endeavors to lessen reaction time, auto locator and following frameworks, wrongdoing mapping procedures, and administration data frameworks. Research as exists is frequently uncertain or proposes that new advancements have less impact on police routine than their defenders anticipate or lean toward (Manning 2001).

According to Kumbuti (2013), information technology has revolutionized the manner in which individuals live, learn, work and collaborate. As crime and criminal activities have become more advanced and new patterns in crime designs have been devised, law enforcement agencies have reacted by upgrading their gear and technologies. The research objective was to determine the level of application of technology as a strategy by Kenya Police to detect crimes in Nairobi City. Primary data source was used in this study where data was obtained through interactive interviews.

The nature of data collected was qualitative and was therefore analyzed using content analysis technique. In regard to the level of application of technology, the study established that Kenya police force has not adopted latest technological advancements in crime prevention. Kenya police force hardly uses soft technologies which enable strategic use of information to prevent crime. The key finding was that Kenya police use personal mobile phones and walkie-talkies as the main communication equipment in crime prevention. With reference to application of Technology in innovation, the study established that technology has not been used to improve efficiency in crime detection by Kenya police force. However, the use of mobile phones has enables police officers to call for assistance whenever they come across crimes.

The study recommends structural reengineering of technological hardware and software at the Kenya police force. There is a need for the purchase of modern equipment that sends real time data on crime. The purchase of modern equipment will enable effective crime prevention and crime management. The study recommended that Kenya police should institute technology in its strategic management approaches and in corporate governance. Technology should be treated as a tool to improve corporate image by increasing public participation in crime prevention and management.

## 2.3 Types of Technology used in policing

According to Odipo (2015), the type of equipment used by our police officers range from the simple but outdated 1940s walkie -talkies and the 1950s G3 riffles that are still fundamental in the day to day running of Kenya police operations to blue tooth controlled chipsets and modern day 9 mm revolvers. When we compare the standards of police equipment in use today in relation to what is in use elsewhere and shared with you a particular image depicting Kenya's 999 service center with US 911 service center. Criminals and terrorists use the modern day sophisticated communication gadgets and weaponry at a time when our police service is still stuck with old mid-20th century technologies. Police agencies have embraced an array of new mobile and stationary technologies in a quest to not only keep up with but stay well ahead of criminals and wrongdoers (Odipo, 2015).

The new technologies are becoming progressively interlaced with the everyday work of police on the fore fronts of law enforcement. Modern software, hardware and communications systems can furnish officers with implementation and investigative instruments to give them more data of interest in the field (Koper, 2009).

Body cameras, in-vehicle personal computers, license plate readers, facial acknowledgment technologies, and even mobile consoles for unique finger reading perusing, are among the apparatuses that are increasing quick adoption (Hazleton, 1978).

Some police offices, for example, the office serving Lincoln, Nebraska, are utilizing map-based applications that can alarm them to areas of known criminal offenders. The application can disclose to them the addresses of a man needed for a wrong doing, known occurrences of lawful offenses in the territory and somebody who was an enlisted sex guilty party. It furnished situational mindfulness that was coordinated with records administration and crisis call frameworks (Walnut, 2016).

San Jose police directors needed to include new versatile Personal Computers and programming to their vehicles and they trusted that the correspondences frameworks that are the establishment of those gadgets should have been best in class. Police in San Jose likewise wanted to work with two cell transporters on the off chance that one was out for

the count in a specific region. The new Personal Computers were outfitted with double modems that could see out two transporters all the while. An ever increasing number of information was being put out to officers in the field. The organization additionally was starting to ask for merchants that could give body cameras to the San Jose division. Tag pursuers, facial acknowledgment innovations, recordings from body cameras, combined with road cameras and automatons, could be collected into enormous databases that could empower law implementation to inappropriately accumulate data about individuals' propensities and goals. In any case, law implementation advocates counter that the new advancements were vital in a world that was being deluged and interconnected by data (Walnut, 2016).

### 2.4 Challenges police officers face in the use of new technologies

With the fast growth of different technologies, law enforcement officers have found themselves barraged with a consistent stream of creative technological tools, which are all intended to enhance fight against crime. It is an overwhelming experience to keep abreast with all the new developments (Smyth, 2011).

Finding a so-called better mouse trap has faced each generation of police leaders. The production of new instruments has dependably been done for significant issues for public officials including officer safety, public protection, operational efficiencies, cost regulation, enrollment and maintenance benefits, et cetera. Over the decades, the so-called hard technologies (e.g., cars, guns, vests, less-lethal weapons, restraints, and barriers) have been the instruments requiring consistent assessment. These devices have differing degrees of significant worth to officers and their associations (Smyth, 2011).

The advances in technology have created a variety of concerns for administration. Employee's security and intellectual property rights are progressively cited as significant ones. With PC attacks worldwide, ensuring privacy of worker information is a developing concern, and risk of an organization in case of security breaches is still unclear (Manning 2005). Securing intellectual property is crucial for all organizations particularly, emerging technology and research and development organizations. Subsequently, associations are creating electronic correspondence strategies that clearly outline permitted electronic activities, utilizes on worker frameworks and observing of

representative documents, for example, email. Numerous organizations have restricted cell cameras and texting in light of expanded danger of intellectual property theft (Manning, 2005).

Leaders of policing in the 21st century must survey the effect of all these technological improvements. Today, officers and regular citizens and law enforcement personnel are looking for and expecting a workplace that improves technology and the human ability. The general population considering careers in law enforcement consequently expects an organizational embrace of this precept. Organizations that do not will often be rejected as outdated (Dessler, 2008).

Law enforcement leaders may recall the profession's slow response to the reality of computer crimes in the early 1990s. Today, almost every crime has a digital component. So, too, agencies are shifting to a techno-savvy workforce, and their leaders should embrace the change and ensure a positive outcome for those they employ and those they serve.

Kenya has no specific provisions for crimes such as identity theft, cyber stalking, chat room abuse and impersonation (Munyua et al 2010). The Kenya communications (Amendments) Act 2013 fails to address cyber-crimes committed against the person.

**2.5 Effects of technological use on the performance of police officers**

On account of the today technology, law implementation officers can discover suspects reasonably effortlessly, and secure citizens in an easy way. Deoxyribonucleic Acid (DNA) can be tried and is utilized for proof in wrong doings. Crime trackers are utilized to recognize crime ridden regions and are utilized to distinguish where law enforcement officers ought to be watching to protect citizens. There is a considerable measure of other innovation utilized in law authorization that subjects enormously appreciate. This kind of technology is utilized to ensure or offer equity to individuals. This positive innovation is constantly expressed gratitude toward and extraordinarily refreshing by the residents of America (Lexington Police Department Official Web Site).

Despite the fact that law implementation technology has constructive outcomes, it can likewise have negative impacts. Numerous individuals trust that law implementation

specialists are snooping in their private business. Not as much as a year back, officers were conceded the authorization to take advantage of people groups' cell gadgets without a court order. This made a significant contention. Many trust that it is wrong for officers to be permitted to tune in into their discussions. They believe they are being dealt with like crooks (Lexington Police Department Official Web Site).

Often times, residents concur that police divisions exaggerate when using technology. In some cases technology that is meant to protect individuals can really turn into a public safety issue. As of late, a contention about robot rambles has surfaced. These automatons were made to keep reconnaissance and ensure that no dangers from psychological terrorists are taken unnoticed. In spite of the fact that that is for sure the intended use, many are concerned that armed automatons could execute an innocent person. Many contend that robots aren't ready to recognize when somebody is posing a threat or not. With each great, new technology advancement there will dependably be a con (Lexington Police Department Official Web Site).

**2.6 Summary of literature Review**

From the review of literature, it has emerged that technology is growing rapidly in nearly every sector in policing and it has a direct impact of law enforcement officer’s performance. Technological advancements have informed present day policing in numerous critical ways. One need just consider that the essential police procedure for a great part of the twentieth century mechanized preventive patrol and rapid response to calls for administration was created in light of the invention of the vehicle, two-way radio communications, and PC aided dispatch frameworks. Later technological developments have additionally had broad impacts on police organizations. Information technology (IT), video surveillance systems, DNA testing, and bullet- resistant vests, for example, are now common and basic instruments in law enforcement Technology also has a bearing on organizational communication and culture. It facilitates the work of police officers in a positive way. Today, almost every crime has a digital component. So, too, agencies are shifting to a techno-savvy workforce, and their leaders should embrace the change and ensure a positive outcome for those they employ and those they serve.

## 2.7 Theoretical framework

This study used postmodern hypothesis of technology by John Watkins Chapman which portrays both a time and a wide development which was created in the late-twentieth. Postmodernism is commonly characterized by a state of mind of suspicion or doubt toward stupendous accounts, belief systems, and different principles of enlightenment, including the presence of target reality and total truth, and in addition thoughts of sanity, human instinct, and advancement. The theory asserts that information and certainties is the result of novel frameworks of social, authentic, and political talk and elucidation, and are in this manner logical and developed. Appropriately, postmodern idea is extensively described by propensities to epistemological and moral relativism, pluralism, self-preferentiality, and irony *(*Thompson, 1914).

In policing, the rise of technology and its effects on organizational conduct, crime patterns, individual work conduct and individual ways of life cannot be overemphasized. Past trends in the economy and moves in industrial management, changes in National policing are additionally inserted in social advances that have been encouraged by developments in technology. A few models are found in the terminations of specific kinds of businesses, for example, book shops, record stores, and camera shops; disappointments of real daily paper organizations; and the noteworthy cutting back of U.S. Postal Service tasks. Every of these reflect change in correspondence achieved by innovation. Different changes have gotten comfortable images of present day life, for example, web based life, texting and web journals, alongside Twitter, YouTube, MySpace and Face book. Conversely, the latter impact systems and present complications for police, as seen in the already strained broadband demands brought about by the marriage of cell phones, televisions, computers, and an inventory of hand-held, portable Web connected devices that respond to desires for flexibility, speed, miniaturization and electronic efficiencies. These are trends that are becoming familiar constructs of modern society and embedding technological change into our way of life.

Policing has to be pondering means to use these shifts to any its organizational ways and the way to require advantage of the new ability sets delivered to the geographic point by the cohort of up to date workers revolutionizing the way individuals live and

communicate. Already we have a tendency to square measure seeing some structure changes, like some police departments currently conducting virtual roll calls wherever officers acquire pre-shift informing info via email or mobile knowledge computers. This mode of data transfer, once offered as another to Associate in nursing in-person vocalization, is commonly the selection of younger officers World Health Organization square measure conversant in, and in some cases more leisurely with, the tech-based mode of communication. But the "electronic" influence goes much further. As an example, 3 years past the Los Angeles Police protecting League (LAPPL), the union for the Police Department's rank and file officers, pioneered a Web-based communication system that enabled the union to carry "virtual" membership conferences. The LAPPL created its transmission system to have interaction its younger officers. Many different police organizations that area unit experiencing the challenge of participating up to date staff have followed suit. Different departments have appointed their up to date worker officers to assist manage social media for the department, a development that becomes even additional crucial at a time of enormous demonstrations and major events. Inevitably, department's area unit seeing the necessity to develop social media policies that govern the suitable use of social media by the officers themselves. Making the proper balance of conserving proof and knowledge whereas protective the rights of free speech is changing into a replacement challenge in several departments.

In the space of crime management, there's modification driven by technology. Net crime, fraud, and cyber influences on crimes like fraud, stalking, bullying and kiddie porn represent a method that technology is influencing crime trends. Websites that supply ways that to access police scanners through live audio feeds to cell phones, and social media accustomed agitate teams like flash mobs represent others. Technology is additionally impacting changes in ancient street ways and investigations, together with alterations in ancient crime management and hindrance activities. for instance, though street robberies might decline once folks carry less money, bank on-line, use debit cards, or purchase and sell on websites like Amazon and eBay, the increasing use of cell phones and different hand-held communications (Jencks, 1974).

From a Kenyan perspective, how many times do our occurrence books go missing in our police stations? Technology adoption would enhance the police work to the next level.

Post Modern theory of technology was seen by the researcher to be the best theory that can help explain the implications of technological advancements on the performance of police officers.

### 2.8 Conceptual framework

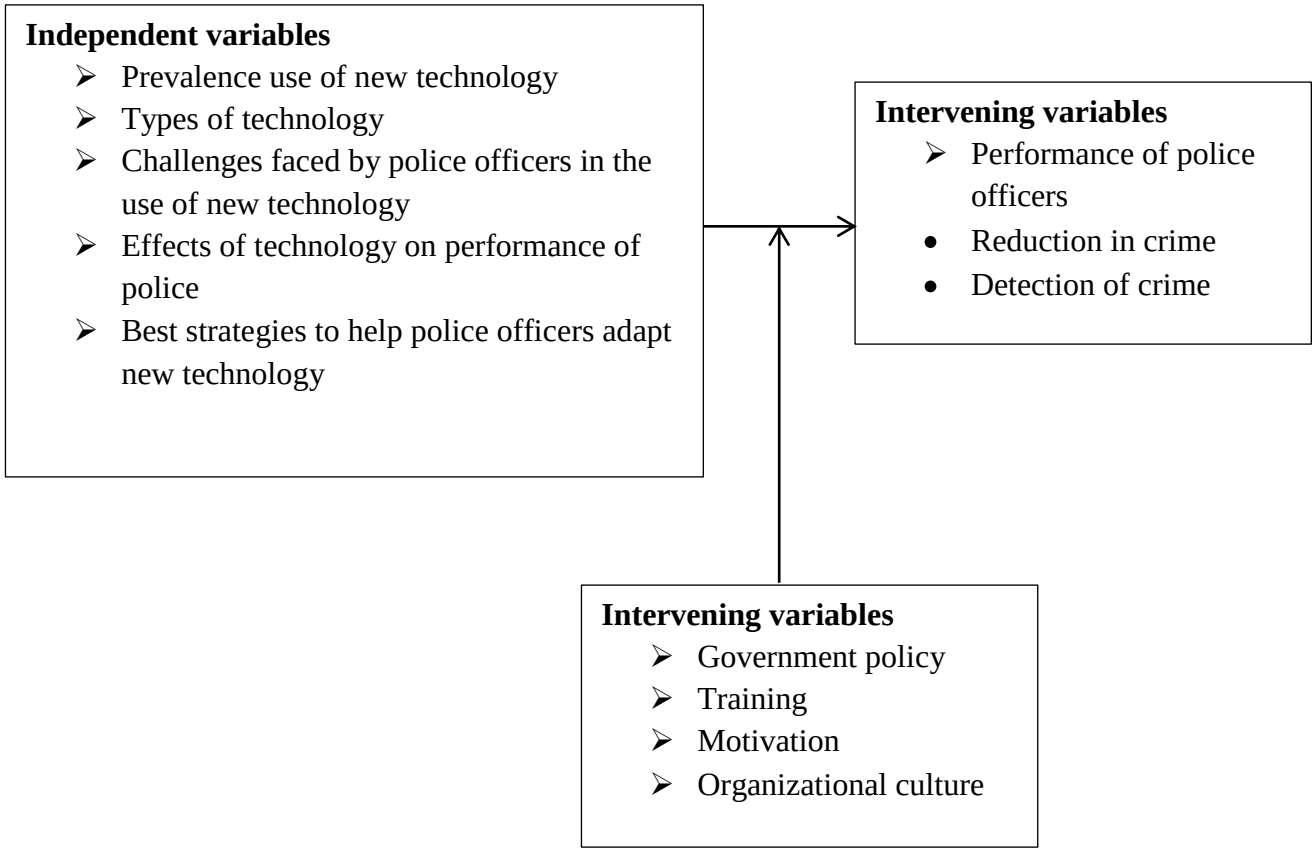


**Figure.2.3.1 Implications of technological adjustments on performance of police officers**

The dependent variable in the above figure is performance of police officers. It depends on the prevalence use of new technology, types of technology, challenges faced in the use of new technology, effects of technology use on performance of police officers and the best strategies to help police officers adapt new technology.

Intervening variables includes government policy, training, motivation and organizational culture. The government policy put in place determined whether the police service had the prevalence to use new technology. Training of police officers determined whether the police service had the right resources of using technology. Motivation and organization culture also contributed in determining whether the police service have challenges in using the new technology.

The outcome which is performance of police officers was measured by detection and reduction of crime.

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.1 Introduction

This chapter describes the research design, population of study, sampling design and procedure, data collection tools, data analysis, validity and reliability of the research instruments.

## 3.2Research design

The study adopted a descriptive survey design. Mugenda and Mugenda (2003), describe a survey design as an effort to gather knowledge from members of a population so as to see the present standing of that population with regard to one or more variables. The design was because it has been associated with a degree economical technique of grouping descriptive knowledge concerning characteristic of a sample of population's current practice, condition or wants. The look was conjointly used as a result of it allowed the man of science to collect information in an exceedingly extremely economical way.

## 3.3 Site of study

The study was carried out at Kenya Railways police unit. Railways Police Unit is a unit within the Kenya Police Service. It is divided into six divisions namely Nairobi, Nakuru, Nairobi Terminus, Mutito Andei, Mombasa Terminus and Kilindini Port Police. Nairobi division has one station namely; Nairobi Railways Police Station which has the following police posts and patrol bases; Nanyuki post, Sagana post, Thika post, Kibera post, Limuru post and Kijabe patrol base. Nakuru division has got five stations which includes; Naivasha Railways Police Station under which we have Gilgil patrol base, Nakuru Railways Police Station, Eldoret Railways Police Station ( under which we have Timboroa Post) Kisumu Railways Police Station (under which we have Kipkelion and Luanda police posts) and Bungoma Railways Police Station( under which we have Malaba Police Post) Nairobi Terminus Division under which we have Nairobi Terminus Station, Nairobi ICD, Athi River Station (under which we have Konza Post, Ulu Post, Kiu Post and Lukenya Post), Mtito Andei division (under which we have Mutito Andei station with Kanga and Kyulu posts , Masongaleni patrol base), Kibwezi station has got Ngwata, Darajani and Kinyabu Post, Emali station has Kima, Sulta, Kavati and Masimba

posts, Makindu RPTC and Makindu Station, Mombasa Division has got Mombasa Terminus, Mombasa Railways, Portreez and Voi Railways Stations. posts under Voi are ;Ngutuni, Maungu, Ndii, Mbololo and Tsavo; Mombasa Railways Station (under which we have Changamwe Post), Portreez Station, Mariakani Station (where we have Chigato, Mariakani, Mazeras Patrol Bases), Miasenyi Police Station (where we have Markonon road, Mugarani and Mayewa posts) and Kilindini Port Division which has got Port Police Station , ICD Nairobi and Lamu port stations. Within each division there are officers from directorate of criminal investigations who report to Formation Criminal Investigation Officer. Nairobi is the capital city of Kenya and the Kenya Railways Police Unit Headquarters is situated there. Due to its economic position, Nairobi reports a high level of technology related crimes such as Criminal and Blackmail, E-Banking Fraud, Social Networking Traps, Identity Theft and Illegal Information access. Nairobi County has got the highest number of police stations and the highest number of police officers. Solutions arising from studies in Nairobi can be replicated across the country (Kenya Railways Annual report, 2015).

### 3.4 Target population

The study targeted 1700 employees of Kenya police service within Railways police unit, who formed the target population of this study. The target population comprised of 500 senior officers of a rank of inspector and above. The remaining 1200 were junior officers of a rank below inspector (Kenya Railways Annual report, 2015).

### 3.5 Sampling size and sampling technique

Sampling is the process of selecting a number of individuals to represent the larger population. The sample frame consists of employees of Kenya Police. The study used simple random and purposive sampling technique. This involved selecting 170 employees from the entire population which is ten percent of the target population. These were the respondents the researcher was able to contact. The sampling techniques used in this study are appropriate because the samples yield research data that can be generalized to larger population. In addition, the researcher purposely targets a group of people believed to be reliable for the study in these case police officers.

### 3.6 Data collection instruments

The study used questionnaires, interview schedules and focused group discussions to collect data from the respondents. The data collection instruments were guided by objectives. The questionnaires targeted officers whose level of education was above form four level. The use of questionnaires as data collection instrument was appropriate as it gathered data over a large sample and the officers selected could read questions and interpret them without a need for interpreter. The questionnaires adopted both open ended and close ended questions. They were administered as a drop and pick later basis where respondents were given five days to go through the questions at their own pace. This was to ensure that correct information is given.

Interview schedules targeted junior officers because many of them have low levels of education and they needed the researcher to interpret the questions for them. Focused group discussions targeted graduate police officers. This is because they could understand the questions very well and make informed contributions to the discussion.

### 3.7 Validity

Validity is that ability of analysis instrument to live what it's meant to live. The queries within the analysis instruments were thus written to deal with specific objectives of the study. The analysis instruments captured things on the prevailing circumstances to deal with content validity. The data collection instruments were also pre-tested and piloted before the main study was conducted. Based on the pre-test, the instruments were reviewed by re-phrasing the questions that would be ambiguous and not well-understood and the irrelevant ones removed.

### 3.8 Reliability

Reliability is the ability of a study to show consistent results on repeated procedures. Reliability of the research was considered by ensuring consistency of the research questions. The researcher ensured that questions are designed and put across in the simplest way possible. This was improved further after piloting the instruments. Reliability of the instruments was also attained through the assistance of my supervisor who has a rich experience in research.

### 3.9 Pilot study

A pilot study was done at Directorate of Criminal Investigation Headquarters Muthaiga, Nairobi County. Directorate of Criminal Investigation is a police formation which handles more complex cases and has several units which includes cyber-crime unit, banking fraud investigation unit, economic and commercial crimes unit and serious crimes unit. It is a formation just like Kenya railways police unit which within has officers from Directorate of criminal investigations which makes it have similar characteristics as the main area of study Kenya Railways Police Unit.

### 3.10 Data collection

Data was sourced from both primary and secondary sources. Primary data was sourced through the use of interviews, focus group discussions and questionnaires while secondary data was sourced from existing records. The researcher obtained a permit from Kenyatta University as well as From National Council for Science, Technology (NACOSTI).

### 3.11 Data analysis

Quantitative data was analyzed using descriptive statistics for example, Percentages, frequencies and mean sores. They were presented using graphs, tables and pie-charts. On the other hand, qualitative data was analyzed thematically that is according to themes and patterns formed. They were presented in narrative and verbatim quotation forms.

### 3.12 Data management and Ethical considerations

The Researcher was just inspired by information that was pertinent to the study and tried to maintain a high level of ethical standards amid the gathering and examination of information. Records got were kept in printed copies and in addition soft copies safely put away by the researcher. As respects to interest in the examination, respondents took an interest in the investigation on informed assent basis. The researcher maintained benchmarks of classification and anonymity. Respondents were guaranteed of their security while taking part in the study. The researcher obtained a permit from Kenyatta University as well as From National Council for Science, Technology (NACOSTI).

# CHAPTER FOUR

# FINDINGS AND DISCUSSIONS

## 4.1 Introduction

This chapter presents the findings discussed in light of the literature review and the interpretation of the researcher. The study aimed at assessing the implications of technological advancement on performance of police officers.

The areas included were demographic characteristics of respondents, the prevalence use of new technology in policing, the types of technology used in policing , challenges police officers face in the use of technology and the effects of technological use in Kenya police service. The findings are presented by blending both qualitative and quantitative approaches, to make sure that qualitative data was used to elaborate the quantitative data in form of narrative and verbatim quotation forms

## 4.2 Questionnaire rate of Return

One hundred and twenty questionnaires were distributed to the respondents, 102 were duly filled and returned, 18 were not returned representing 85% response rate thus valid and equally reliable. The researcher used questionnaires to collect data from police officers within Kenya Railways Police Unit. The gender representation in the study was 39% police woman and 61% police men.

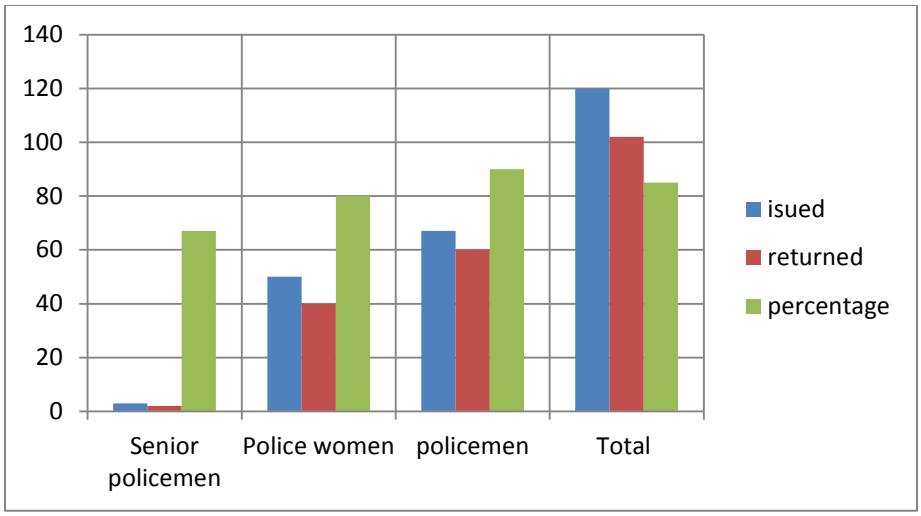


**Figure 4.2.1: questionnaire return rate from the respondents**

The high response rate was attributed to the rapport the researcher had with the respondents. The response rate was good enough to give credence to the findings.

Four schedule interviews were conducted with 10 respondents each while four focused discussion groups with seven respondents each were conducted.

### 4.3 Demographic characteristics of respondents

The demographic characteristics of the respondents that were examined are sex, age, education level and functional departments of police officers. These were the variables that helped to lay a framework for explaining the findings of the study.

#### 4.3.1 Age of the respondents

In a bid to find out the distribution of respondents by age, the study found out that majority were aged between 31 and 40 years at 54%; followed by those aged between 20 and 30 years at 22%.Those aged between 41 and 50 years were at 20% and 4%for those aged between 51 and 60 years. This implies that young police officers who had served for several years had knowledge in technology used in Kenya police service and could make great use of their innovative young minds to appreciate change in technology easily. The findings are illustrated in figure 4.1.2 below. The young officers were techno-savvy and had been deployed at records offices and crime investigations**.** Experience in policing is important as it helps a police officer to clearly understand the offender- victim interaction in respect to the crime under investigation (Schein, 1975).

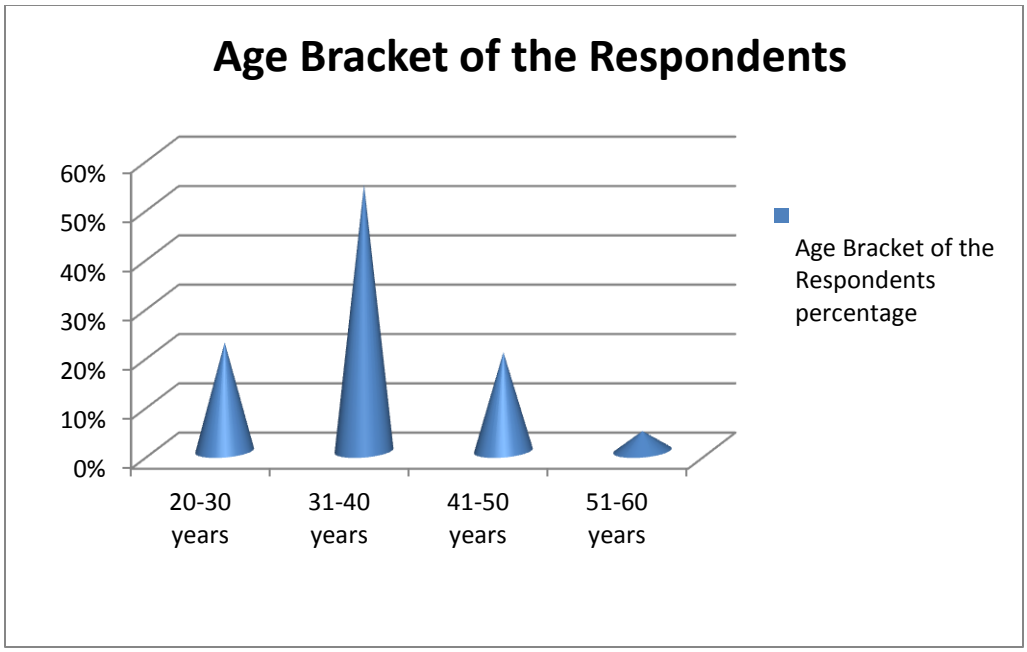


**Figure4.3.1: Age Bracket of the Respondents**

### 4.3.2 Sex of the respondents

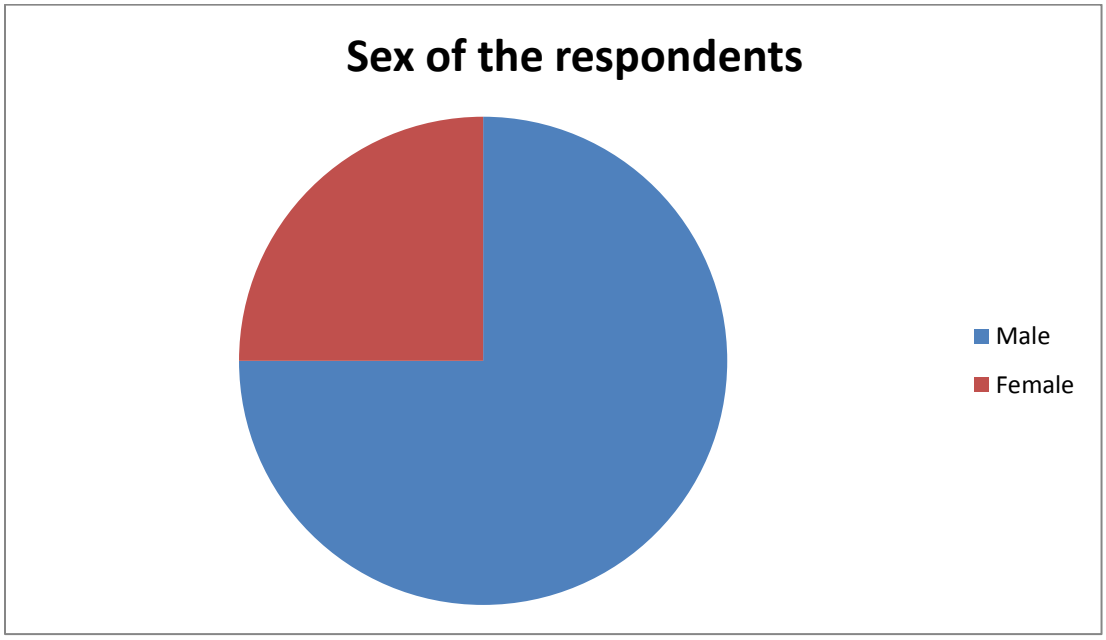


**Fig. 4.3.2 sex of the respondents**

Sex of the respondents was an important consideration to the study. The males who participated in the study were 61% and the females were 39%. The percentages were

attributed to the low ratio of female officers as compared to male officers. According to (Uzair, 2013), society does not consider the police as a profession of choice for woman due to Irrational working hours, difficult job environment and the gender stereotyping of police work. Views from female respondents were no different from those of the male respondents rather they were complementing each other. According to (Susan, 1996), despite the growing number of women in policing, women still face barriers which include gender stereotyping of police work.

Many police associations over the United States keep on battling with issues relating to the recruitment of female hopefuls academy and field training. Also, police agencies often confront challenges identified with the progression of female officers inside the organizational hierarchy. Schultz (2003) communicates these difficulties looked by female officers as far as potential internal barriers (factors identified with a generally male dominated police culture) and external obstructions (factors identified with clashes between work and family).

On September 3, 1910, in the city of Los Angeles, Mrs. Alice Stebbin Wells became the first official police lady in the United States. Her obligations included administering and authorizing laws relating to dance halls, skating rinks, theaters and other open entertainment zones. She addressed to public gatherings around the country in then couple of years about the place of ladies in the police administration and her endeavors brought about the Chicago city board passing a law that accommodated the contracting of police ladies by 1915 Chicago utilized 30 police ladies (swan, 1988) who worked for the most part with troubled youth and victims and offenders. Amid World War I, police ladies were used to repel whores from military camps and to aid the return of ran away women and girls (Bell, 1982). Police women can be very vital in implementing technological advancements in cases where women offenders are involved.

The employment of women police involves a spread of advantages that have often times been denied or underestimated. Equity in policing supports the world mission to form genuine equality and independence for girls, together with through employment and higher delivery of social services (United Nations, 2009). Policing can give secure and

stimulating work for women, with numerous career opportunities, and with increasing opportunities for flexible employment. The presence of girls police conjointly provides another contact purpose for victims of crime confronted by the well-documented unfitness of the many male police (National Center for Women and Policing, 2002). Policy manufacturers must guard against 'gender essentialism' in promoting feminized policing (Niazi, 2013), and civil rights should remain the first explanation for promoting police careers to girls. At the identical time, there is a robust argument that feminine victims of crime, particularly, ought to have access to female officers (Niazi, 2013). Female victims of cybercrimes can be helped better if they find a woman police officer is handling their case. They can feel more open to express themselves to women as opposed to the male police officers.

The depth of police resistance to gender equity incontestable the necessity for robust equal employment chances legislation to beat discrimination and for social action in some cases. Within the U.S., the imposition of enlisting quotas through legal proceeding and consent decrees was crucial to advancing the standing of ladies police (Martin, 2007).

According to E. O. Alemika and A. O. Aaguguas book on Gender relations and Discriminations in the Nigeria Police Force, women constitute only 4% of the force and about 8% of the officer cadre. The under-representation arose from the views expressed by some that women are not suitable for Police work, characterized by paramilitary duties such as fighting dangerous men in the Society with guns. However research has shown that less than half of Police work involves crime fighting. Detection, investigation, prevention and apprehension of offenders require female officers. Female offenders are preferably arrested by female officers. This is to prevent future allegations of sexual harassment.

Forms of Gender issues and discriminations apparent in the Nigeria Police Force are manifested in the following forms: Married women are disqualified from enlistment into the Nigeria Police Force, Women are compelled to stay 2 years on the job after enlistment before marriage and are required to apply for approval to marry and the fiancé

subjected to investigation and approval, Discrimination against female officers by prescribing limited training and restricted sphere of posting for Police women, the dressing of Police Women to the extent that they are prohibited from wearing earrings, face powder or lipstick, Police Women are sometimes "appointed" into soliciting money from motorists on behalf of their male counterpart while on „stop and search" duties., Sexual harassment from Senior Police Officers, especially unauthorized, indecent touching of Police Women, Making of uncomplimentary remarks against Police Women, Punitive posting of Police ,Police Women mandated to inscribe the alphabet „W" before their Rankand Name to indicate that they are women. For example W ASP Mary Ojoma and Police Women are given special kind of A/P numbers to easily identify them as women. These negative habits towards police woman demoralize them and make their performance lower than those of police men.

The Police Service Commission and other Oversight Bodies realize the need to stop all forms of Gender discrimination and sexual harassment in the Nigeria Police Force and accordingly, the Nigeria Police Force shall: Recruit women into the Force in the same manner as their male counterparts irrespective of marital status, Stop Police Women from applying for approval to marry and presenting their fiancé for character investigation, Post Police Women alongside their male counterpart to head State Police Commands and other Formations, Ensure that at least the two most senior female Police officers are in the top management team of the NPF irrespective of ranking. Allow police women who so desire to wear uniform stud earrings, desist from placing the alphabet "W" against a Police women's name /rank and Ensure that the Force numbering of Policewomen is in the same serial as those of their male counterparts. This then improved morale and hence better performance.

There is also the need to comply with obligations under International Laws and Instruments such as: The Convention on the Elimination of all forms of Discrimination against Women. (CEDAW), the Beijing Declaration and Platform for Action (1995) United Nations Security Council Resolution 1325 on Women, Peace and Security.

The gender equity agenda in policing has conjointly been challenged by analysis indicating that a staged approach is also additional prospering in strongly paternal societies (Macdowell Santos, 2005; Natarajan, 2008). This involves the establishment of ladies police units that job for the most part with women and kids. Cultural acceptance of ladies police through this work will open the doors to gradual integration into thought policing. This can make it easier even to deal with challenges of technological advancements which may include female victims and offenders.

### 4.3.3 Functional Departments of the respondents

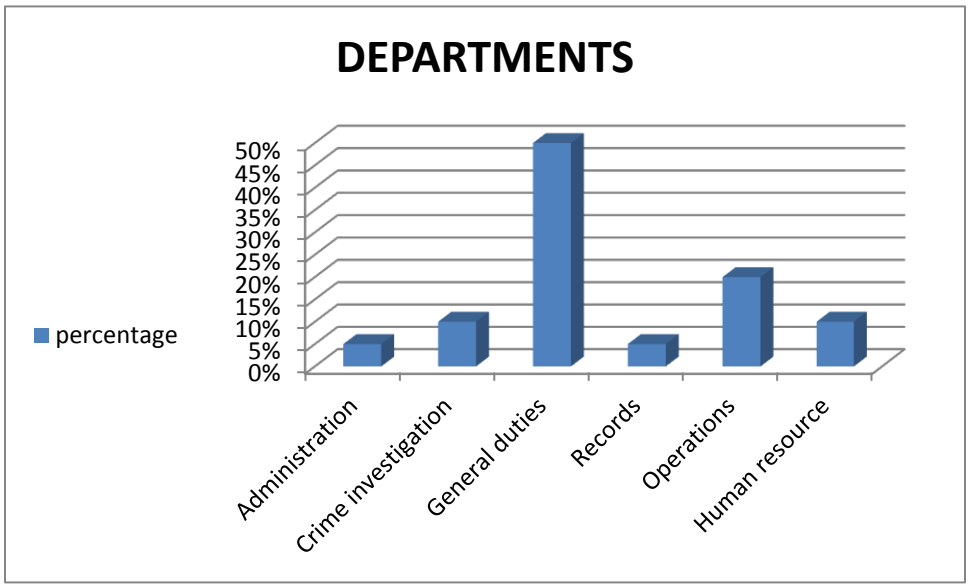


**Figure 4.3.3 Departments of the respondents**

The research sought to establish the departments respondents were deployed in the Kenya Railways Police Unit. The findings showed that 5% of the respondents were deployed in administration, 40% in general duties, 20 % in crime investigations, 5% in records, 20% in operations and 10% in human resource department. Police officers deployed in general duties were the majority respondents. These general duties include the report office and cell sentry personnel, the court orderlies and patrol duties. Their contribution was very vital as they are the ones who receive and record all the complaints reports from members of the public. The administration is mainly done by the senior police officers who form the minority of the respondents. All the respondents gave complimenting results to the

research questions. Officers employed been operations included those in various SGR (Standard Gauge Railway) camps along the Railway officers in records offices act as secretaries to the senior officers.

### 4.3.4 Education level of the respondents

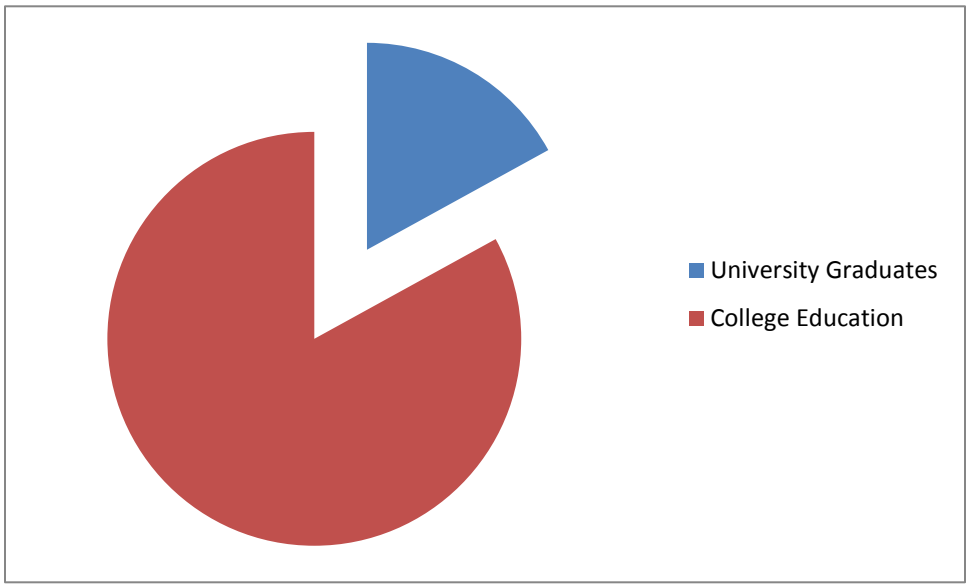


**Figure. 4.3.4 Education level of the respondents**

From the respondents 17% were university graduates in various disciplines which included criminology, human resource management and information technology .eighty three percent were college graduates which included the mature officers who had experience in police work. Academic background and experience made them useful to the study. Post high school training positively influences police officers performance (Mathew, Boston, 2005). Graduate police officers have a career advantage over those without degrees for it helps them to work effectively to detect and curb crime (Susan &James 2013).

### 4.4. Technologies used in Kenya police service

According to the respondents pocket phones were the most used in Kenya police service at 60% followed by computers at 20%, CCTV cameras at 10% and in-vehicle computers

at 5% and use of apps that can alert officer's locations of known criminal offenders at 5%. A respondent during a focus group discussion noted that

*"...most of the technologies used in Kenya police service include the pocket phones which you will find in every police station and even police posts and bases, few stations have computers ..."*

With use of pocket phone being at 60%, most police stations have pocket phones whereby in one station you can find at least five pocket phones. One used by the officer in charge of the police station, the duty officer, the crime standby, and the in charge patrols, in charge armoury and the other by the report office personnel.

Computer use being at 20%, respondents noted that police stations have computers only at the records offices. Most offices which include crime office, report office, traffic office, and armoury lack computers. The study found out that reports made by members of the public are written in occurrence books which are manual. Once the occurrence book is filled up it is stored in other offices. This is a risk in that it can get lost at some point and all the information inside gets lost. The respondents noted that if reports at the report office could be recorded manually and later typed and stored in computers with software which can send the same to a central office within the Kenya police headquarters and then stored in a hard disk then safety of police information would be guaranteed.

CCTV Cameras came at 10%; the respondents noted that the available CCTV Cameras are available in buildings other than the police stations. The cameras help very much in identifying offenders, detecting crime and curbing the same.

Most of the respondents noted that the apps to locate the location of known offenders has been very helpful especially in dealing with the emerging cybercrimes which include the online fraud, hacking, copyright/piracy ,cyber terrorism, cyber stalking and phishing. One of the respondents noted that individual and corporate bodies' websites are hacked into and confidential information accessed, but with the applications used mostly by the Criminal intelligence unit (CIU) to track the location of the offender then it has made it easy for investigators to apprehend offenders.

One of the officers based at CIU Railways noted that

*"…. Criminals like that guy who had hacked the Kenya Revenue Authority systems was able to be traced and brought to book thanks to the new technology..."*

The study established that though Kenya police service has not had the latest types of technology, it's at least somewhere in the journey of advancement.

A member in focused group discussion pointed out a case in Kenya November, 2017 where thieves had dug a hole from a stall they had rented in a strong room of Kenya commercial bank (KCB) Thika and made away with 52 Million Kenya shillings. According to The daily Nation newspaper of 20th November, 2017, consistent with investigating officers, with a gathering at a building early in June, 2017 to debate business ideas. There have been three men at that meeting and shortly when, they were joined by alternative three men. As they talked and brain stormed one in every of the two men advised the creating by removal of a tunnel into the bank and as they mentioned the way to accomplish the task. one in every of them advised that they rent stalls at a building next to the bank and fake that they were selling stationery. They rented two stalls and branded them Sky net ideas. When it slow they completed they required extra space and rented two others, taking a complete of four. Investigators aforementioned inside three weeks that they had assembled all the tools and instrumentation required to drill the tunnel. They said the tools included diamond cutting and soil drilling bits, an oxygen gauge complete with nozzles, assorted spanners, metallic and wooden bars, safety gloves as well as tracking devices and central processing units. It was alleged that a lady had taken a video and posted on social media with lots of money in a house. Investigations led officers to a house in Juja town where some money was recovered and four suspects arrested and arraigned in court. The respondents noted that technology has been very helpful to investigators (Focus Group discussion 2).

This group discussion 2 is corroborated by a survey done by Reaves 2010 which says that, Developments in IT has enhanced knowledge sharing, crime analysis, and performance management in police agencies in some ways over the last few decades. in step with the 2007 LEMAS survey, 0.5 or additional of native police departments and

sheriffs' offices use computers for records management, crime investigation, personnel records, info sharing, and dispatch (Burch, 2012: 15;Reaves, 2010: 22). Indeed, computers square measure currently used for these functions during a majority of nigh the littlest police agencies. Agencies conjointly use computers to support functions like automatic booking, fleet management, and resource allocation. As of2003, the bulk of police agencies maintained electronic knowledge on incident reports, arrests, demand service, transferred property, and traffic citations (Hickman and Reaves,2006a: 31; 2006b: 31). Alternative knowledge that agencies typically maintain in electronic form include warrants, criminal histories, traffic accidents, and summonses. In addition, quite 1/2 native agencies reportable having in-field computers or terminals for his or her officers as of 2007 (Burch, 2012: 16; Reaves, 2010:23).More than ninetieth of native police departments serving populations of twenty five, 000 or more currently have such capability, as do quite eighty five of sheriffs' offices serving populations of a minimum of a hundred, 000. Agencies with in-field computers or terminals.

According to Odipo Rianga (2015) on the type of equipment used by our police officers – ranging from the simple but outdated 1940s walkies talkies and the 1950s G3 riffles that are still fundamental in the day to day running of Kenya police operations, at a time when communication gadgets have been upgraded to blue tooth controlled chipsets and modern day 9 mm revolvers, when we compare the standards of police equipment in use today in relation to what is in use elsewhere and shared with you a particular image depicting Kenya's 999 service center with US 911 service center. Needless to say, criminals and terrorists use the modern day sophisticated communication gadgets and weaponry at a time when our police service is still stuck with old mid-20th century technologies. (TNS) .Police agencies have embraced Associate in new mobile and stationary technologies in a quest to not only keep up with however keep well previous criminals and wrongdoers. The new technologies are getting more and more tangled with the daily work of law enforcement officials on the front lines of enforcement. The computer code, hardware and communications networks, a lot of and a lot of them supported mobile systems will equip officers with social control and fact-finding tools to produce them with a lot of info on demand within the field (Janet, 2001).

Body cameras, in-vehicle computers, registration number plate readers, automatic face recognition technologies, and even mobile consoles for fingerprint reading, area unit among the tools that area unit gaining fast adoption.

Some police departments like the agency serving Lincoln, Nebraska, area unit exploitation map-based apps that may alert them to locations of glorious criminal offenders. "Officers will drive down the road, and have a Smartphone or a pill device, and have the map app open," Roberts same. "The app will tell them the addresses of an individual needed for a criminal offense, glorious incidents of felonies within the space, somebody UN agency was a registered convict. It provided situational awareness that was integrated with records management and emergency decision systems. “The whole purpose of the new technologies was to supply period knowledge.

San Jose police directors needed to feature new mobile computers and software package to their vehicles and that they believed that the communications systems that area unit the inspiration of these devices required to be progressive. Police in San Jose additionally were getting to operate with 2 cell carriers just in case one was out of commission during a specific space. The new computers were equipped with twin modems that would see out 2 carriers at the same time. Additional and additional information was being place intent on officers within the field. The agency additionally was starting to request vendors that would offer body cameras for the San Jose department. Registration code readers, face recognition technologies, videos from body cameras, in addition to street cameras and drones, may well be mass into immense databases that would change enforcement to improperly gather info regarding people's habits and destinations. However enforcement advocates counter that the new technologies were necessary during a world that was being deluged and interconnected by info (Walnut, 2016).

Law enforcement agencies use a spread of forensics technologies to assist them within the identification of criminal offenders. One among the foremost important enhancements to those capabilities in recent decades has been the event of identification tests exploitation deoxyribonucleic acid, usually referred to as DNA. DNA tests identify distinctive individual genetic codes from DNA samples that square measure extracted from biological proof like blood, semen, hair, and saliva. Developed within the Nineteen

Eighties, DNA testing has become a typical methodology of identification, significantly for sex crimes and alternative violent offenses, and it's wide viewed because the state of the art in offender identification (National analysis Council, 2009). Within the US, DNA testing is generally employed in violent crime cases because of its expense; however its use for property crimes is additionally increasing (Richard, 2011).

### 4.4.1 Types of technologies

Kenya Police Service use pocket phones, computers, CCTV cameras, apps to identify location of known offenders in collaboration with Safaricom, finger print identification which is done at criminal records office CRO. In vehicle computers, sophisticated weaponry like the G3 RIFFLES, AK47, MP5, GPMG riffle, PISTOLS e.t.c.

### 4.4.2 Benefits of technology

**Table 4.4.2 Benefits of technology on performance of police officers**

| | Agree | Disagree | Not Sure |
|---|---|---|---|
| It has Improved accuracy | 46% | 5% | 3% |
| Improved Speed of case investigations | 43% | 4% | 7% |
| Improved communication in the organization | 50% | 2% | 2% |
| Reduced response time | 26% | 8% | 10% |
| Improved Motivation to perform duties | 7% | 34% | 13% |

As indicated by Bailey, 1999, Firearms were the most punctual type of assurance utilized by peace officers. Be that as it may, even those did not show up until the late 1860s, fundamentally on account of a reaction against the armed and severe police powers of

Napoleonic France. Cops wore civilian clothes, had no formal preparing, and, on the off chance that they carried guns, they were concealed. That changed with the military draft mobs of that time and the beginning of the Civil War. Suddenly the uniform, once the image of oppression, was a symbol of respect. American lawmakers and nationals dismissed the European model of unchecked power, and made the neighborhood police responsible to non-military personnel specialist (Dowling, interview).Guns turned out to be more ordinary as residents acknowledged the viciousness that occasionally emitted in police-native experiences, and upheld the officers' have to secure themselves.

Bailey 1995 sees that, Until the 1960s the pistol was a standard in law authorization. However, in 1966, a California police division embraced the Colt. Forty five ACP self-loading weapon, one that had been utilized by the U.S. military since the mid-1900s. In spite of the fact that the weapon was very functional, the general police network sat tight for the formation of the twofold activity self-loader before it considered straying from the reliable revolver. The self-loader gun is self-stacking weapons, utilizing the remaining vitality of a fired shot to launch the spent cartridge, extricate a cartridge from the magazine, embed it into the gun's load, and reset itself for another shot. The trigger draw as soon as possible activity's originally shot requires a hard ceaseless force. Resulting shots are a shorter, easier trigger press executed from the slide-positioned pound position. The police network has grasped the utilization of the self-loader 30 years after its introductory selection. Its defenders at first commended its minimized shape, expanded ammunition capacity, quick reload, fast fire and lessened force.

National Institute of Justice1986 noticed that as of late, in any case, that view has turned out to be more engaged, with numerous in policing contending that self-loading rifles are a viable approach to react to hoodlums who appear to convey greater and better guns. Police have a proceeding with worry with being "outgunned." Facing such automatic weapons as the AK47, the Mac 10, and the Uzi has many persuaded that the best way to do fight in the roads is projectile for shot, round for round. Also, the main weapon capable is the self-loader. These worries extended after a 1986 Miami shoot out that left two operators dead and five injured after a firefight with two exceptionally prepared crooks equipped with programmed weapons. Following the occurrence, the operators

took a gander at its tactics, and all the more nearly, its weapons and ammo. After broad investigation and testing it received quick firing weapons framework that gives its operators a selection of guns. The agency was inundated with a pattern that eventually cleared the whole nation. There were the individuals who needed to keep the workable and reliable gun. They cited statistics that said an officer once in a while discharge in excess of five shots in a gunfight; therefore the gun's six projectiles should be sufficient. They said shot position and strategies were the issue, that officers were undertrained, that preparation was doubtful, and that range capability once a year was insufficient. They contended that quick firing rifles were standards for: Portable, versatile, and base station transmitters; versatile collectors; and batteries for portable radios; Walk-through and handheld metal weapons detector, Portable x-beam gadgets for bomb demilitarization, Communication gear, for example, voice scramblers, auto area frameworks, and radio transmitters, beneficiaries and repeaters; Active and uninvolved night vision devices; Magnetic, mechanical, and mercury switches for thief alarms; Handcuffs, revolt head protectors, crash caps, police body covering, ballistic shields, and hearing protectors

As indicated by National Institute of Justice 1980s, it made two instruments for progression of its work in testing equipment and setting guidelines. It built up the Technology Assessment Program Information Center to pick research centers for testing hardware, overseeing the testing procedure, and distributing reports of test outcomes. It additionally settled the Technology Assessment Program Advisory Council, a vast warning assemblage of senior neighborhood, state, and government law requirement officials. Both the middle and the committee are ancestor activities to current projects. In the right around a long time since the Crime Commission's report; other innovative advancements have likewise helped the police. Convenient radios have been made lighter, all the more ground-breaking, and easier to utilize. Police are presently utilizing phones in numerous agencies. A critical innovative development profiting the police in their day by day work has been the development of pepper shower as a power elective. Despite the fact that it has demonstrated prominently helpful, the police require other power choices.

Steven Bishop, previous head of police of Kansas City, Missouri, points out that policing by and large has been scammed in the moderate development of innovation for ensuring road officers'. For every one of the advances in the previous 30 years, there are still impediments to the improvement of police innovation. As we have seen, in the late 1960s the government started to assume duty regarding cultivating the advancement, accessibility, and adoption of new advances to encourage nearby and state police. Section Two of the report examined how the administration is satisfying that duty through the National Institute of Justice and its Office of Science and Technology and the snags to their advancement (NIJ, 1994).

The mandate of the National Institute of Justice, the criminal justice research and development arm of the U.S. Department of Justice, is to improve and fortify the country's arrangement of equity with essential accentuation on nearby and state agencies. As of late Congress, with solid bipartisan help, has granted NIJ significantly increased financing to speed advance in police innovation. The extended financing, through the1994 Crime Bill and different measures, is government acknowledgment of the vital job innovation can play in helping the police in their work. The motivation behind NIJ's Office of Science and Technology is characterized by its name. It is the focal point for propelling criminal equity innovation. Through OST, the National Institute of Justice has created intentional models, tried new gear, and dispersed data on technologies. The recently expanded subsidizing has heightened NIJ's endeavors to comprehend policing (NIJ, 1994) Overall tasks and its particular mechanical prerequisites; energize look into and development of fruitful innovations; and (3) defeat deterrents abating or crashing technological progress. The last objective is to move the best new advances from the research facility and from different offices to the commercial center and the law implementation shopper.

According to Vice Admiral E. A. Burkhalter, 1850s, the first multi-shot gun, presented by Samuel Colt, goes into large scale manufacturing. The weapon is adopted by the Texas Rangers and, from there on, by police organizations nationwide.1854-59San Francisco is the site of one of the most punctual uses of systematic photography for criminal identification. In 1877, the utilization of the transmit by police and discharge departments

begins in Albany, New York in 1877. In 1878, the phone comes into utilization in police precinct houses in Washington D.C.1888, Chicago is the primary U.S. city to receive the Bertillon system of distinguishing proof. Alphonse Bertillon, French criminologist, applies methods of human body estimation utilized in anthropological classification to the distinguishing proof of culprits. His system remains in vogue in North America and Europe until it is supplanted when the new century rolled over by the fingerprint method of distinguishing proof.

In 1901, Scotland Yard embraces a unique mark characterization system devised by Sir Edward Richard Henry. Subsequent unique mark grouping frameworks are generally extensions of Henry's system.1910 Edmund Locard builds up the main police wrongdoing laboratory in Lyon, France.1923 the Los Angeles Police Department sets up the first police wrongdoing lab in the United States.1923 the utilization of the print is introduced by the Pennsylvania State Police.1928 Detroit police start utilizing the restricted radio.1934 (Vice Admiral, 1850).

Boston Police start utilizing the two-way radio. In 1930s American police start the far reaching utilization of the automobile. In 1930, the model of the present-day polygraph is developed.1932The FBI initiates its wrongdoing research facility which, over the years, comes to be world renowned. 1948 Radar is acquainted with activity law enforcement.1948. The American Academy of Forensic Sciences (AAFS) meets out of the blue in 1955.

The New Orleans Police Department introduces an electronic information handling machine, conceivably the first department in the nation to do as such. The machine is not a PC, however a vacuum-tube worked calculator with a punch-card sorter and collator. It summarizes arrests and warrants. In 1958 a previous marine designs the side-handle rod, a baton with a handle appended at a 90-degree angle near the grasping end. Its flexibility and viability in the long run make the side-handle twirl doo standard issue in numerous U.S. police agencies.in 1960s. The first PC helped dispatching framework is installed in the St. Louis police department. In 1966 the National Law Enforcement Telecommunications System, a message-exchanging office connecting all state police PCs aside from Hawaii, comes into being.1967, The President's Commission on Law

Enforcement and Administration of Justice infers that the police, with wrong doing research centers and radio networks, made early utilization of innovation, yet most police departments could have been prepared 30 or 40 years ago as well as they are today."1967 FBI introduces the National Crime Information Centre (NCIC), the primary national law enforcement computing focus. NCIC is an electronic national filing framework on needed people and stolen vehicles, weapons, and different things of significant worth. One observer notes NCIC was "the primary contact smallest departments had with computers."1968AT&T declare it will set up an extraordinary number 911 for crisis calls to the police, fire and other crisis administrations. Inside quite a while, 911systems are in far reaching use in substantial urban areas.

Starting in the late 1960s, there were numerous endeavors to create revolt control advances and utilization of-force alternatives to the police benefit pistol and twirly doo. Attempted and deserted or not generally received are wooden, elastic and plastic slugs; dash weapons adapted from the veterinarian's sedative firearm that infuse a drug when shot; an energized water stream; a mallet that carries a 6,000-volt stun; synthetic concoctions that make streets to a great degree elusive; strobe lights that cause giddiness, blacking out and sickness; and the immobilizer that, when squeezed to the body, conveys a 50,000-voltshock that cripples its injured individual for a few minutes. One of only a handful couple of advances to effectively develop is the TASER which shoots two wire-controlled, minor darts into its unfortunate casualty or the injured individual's garments and conveys a 50,000-volt stun. By 1985, police in each state have utilized the TASER, yet its notoriety is confined attributable to its constrained range and constraints in influencing the medication and liquor inebriated. A few organizations embrace bean pack rounds for group control purposes in 1970s.

The vast scale computerization of U.S. police divisions starts. Significant PC based applications in the 1970s incorporate PC helped dispatch(CAD), administration data frameworks, unified call gathering utilizing three-digit telephone numbers(911), and brought together coordinated dispatching of police, fire, and therapeutic administrations for expansive metropolitanareas.1972The National Institute of Justice starts a task that prompts the advancement of lightweight, adaptable, and agreeable defensive body

covering for the police. The body shield is produced using Kevlar, a texture initially created to swap steel belting for outspread tires. The delicate body protective layer presented by the Institutes credited with sparing the lives of in excess of 2,000police officers since its commencement into the law requirement community.MID-1970s.The National Institute of Justice subsidizes the Newton, Massachusetts, Police Department to evaluate the reasonableness of six models of night vision gadgets for law implementation utilize. The investigation prompts the across the board utilization of night vision adapt by the present police agencies.1975Rockwell International introduces the primary unique finger impression peruser at the FBI. In 1979, the Royal Canadian Mounted Police executes the main real programmed unique mark recognizable proof framework (AFIS).1980Police offices start actualizing "enhanced"911, which enables dispatchers to see on their PC screens the addresses and phone numbers from which 911 crisis calls originated.1982Pepper splash, broadly utilized by the police as a power elective, is first created. Pepper shower is Oleoresin Capsicum (OC), or, in other words capsaicin, a dismal, crystalline, unpleasant compound present in hot peppers.1993More than 90 percent of U.S. police offices serving a populace of at least 50,000 are utilizing PCs. Many are utilizing them for such moderately refined applications as criminal examinations, planning, dispatch, and labor allocation.1990sDepartments in New York, Chicago, and somewhere else progressively utilize advanced PC projects to delineate dissect wrongdoing patterns.1996The National Academy of Sciences reports that there is not anymore any motivation to scrutinize the unwavering quality of DNA evidence (Bellie, 1995).

### 4.4.3 Areas where technology has negatively affected performance of police officers

One of the respondents during a focused group noted that;

"*... secret police information is not secret anymore ...this is because* of *social media platforms such as face book, whatsapp, twitter and also telegram. When information is supposed to get to only police officers it ends up in the hands of members of the public and even criminals. This may make it hard for a criminal to be apprehended.*

Other respondents also noted that some officers while on duty browse their phones and you will find them in whatsapps, face book, telegram while on duty and this affects their performance.

### 4.5 Challenges police officers face in adopting new technology

According to the study, 52% of the respondents noted that lack of funds to acquire update equipment's was a major challenge facing police officers in their effort to adopt new technology. Senior officers noted that the funds allocated to police divisions are never enough to afford modern equipment's. Cyber forensic equipment's are expensive to acquire a contributing challenge in adopting new technology. Most of the cybercrimes cannot be properly investigated without essential equipment 'sand training on both software and hardware.

The study found out that, due to fast technological advancements the digital forensic tools become obsolete too often. 40% of the respondents had the view that this has become a major challenge because they are expensive and the budget allocation to acquire them is limited.

Twenty tow percent of the respondents noted that lack of motivation in terms of welfare of police officers remains to be a challenge. One of the respondents noted that

*".....if police officers were paid well, they could go a step higher to improve their knowledge on new technologies, but if the pay is a meagre then are they going to pay school fees for their children or take themselves to school to know about technology?..."*

Ten percent of the respondents noted that lack of specialized training is also a challenge that is facing police officers in adopting new technology. Respondents noted that police officers by the date of this research were not equipped with up to date technical knowhow to adequately investigate technology related crimes. With rapid changes in technology, law enforcement officers are not adequately equipped to detect and deter cyber-crime. A respondent indicated that scenes of crime personnel ought to have training on forensic evidence recognition and collection techniques to avoid contamination and destruction of critical evidence. The above view corresponds with (Hollis, et al,2000), that police

officers need specific levels of training and certification to correctly, effectively and efficiently carry out their roles when investigating electronic crimes, collecting and examining evidence and providing evidence in court.

One of the respondents noted that the training done to police officers on initial training was shallow and did not cover technical knowledge on sophisticated crimes such as cyber-crime. Most of the officers who are deployed in investigating sophisticated crimes mainly gained the knowledge through their own private studies which are self-sponsored.

A respondent at director of criminal investigation Railways headquarters noted that police officers at railways police unit and other parts of the country had received various crime reports which entailed use of sophisticated technology but due to lack of specialized training on these areas they could neither handle the offences nor offer advice to the complainants. They find themselves referring them to cyber-crime unit .This leads to low confidence to police from members of the public.

The study discovered that at some instances, whenever the evidence was acquired, the data with evidential value was quite quantitative and required large storage capacity devices of which were costly and not always available to the disposal of the officers. This made it cumbersome and time consuming to analyse the digital evidence.30% of the respondents cited this occurrence as a rare occurrence 40% of the respondents citing it as very rare. 10 % cited it as often.

Private companies dealing with information and technology were unwilling to share their infrastructure with law enforcement agencies citing consumer concerns on confidence on the privacy of their information. Relationship between law enforcement agencies and private corporations are vague in many cases for there are no developed relationships between police executives and the management of primary companies and corporations (US department of justice cops report, 2009).

Few police officers at railways police unit are mandated to offer forensic investigations and examinations. 60% of the respondents noted that they were over strained by the demand for their services, a factor that led to delays in compiling reports and backlog of court cases due to busy schedules for the officers. The shortage is of personnel was

brought about by the fact that officers sponsor their own trainings which were costly versus the government payment which could not stand the competitive and lucrative offers by the private sectors, hence a constant shortage of skilled manpower.

Unemployment of techno-savvy personnel was seen a major challenge in adopting technology in Kenya police service. 54% of the respondents cited that while conducting police officers, there is no a consideration of which courses one undertook in the case of graduates. This leads to eliminating techno-savvy individuals just because they are not good athletes per say. One of the respondents during a focused group discussion cited that"

*".....you find that the recruiting officer is more concerned with physical appearance of the candidate other than the academic potential. Police service is seen as a profession where if you fail in high school studies, then you are only suited for disciplined forces. This perception locks out potential candidates who would bring in a wide range of expertise that could improve investigations and curbing crime..."*

Job placement being poor was also seen as a challenge in adopting technology. A respondent noted that

*".....in the Kenya police service you will find an ICT expert is deployed on patrol duties while a person deployed in banking fraud unit is a specialised in something different. If only police officers could be placed where they fit based and not on the basis of who knows who, then we could be very far in terms of performance..."*

The expansive scale computerization of U.S. police offices starts. Significant PC based applications in the 1970s incorporate PC helped dispatch(CAD), administration data frameworks, brought together call accumulation utilizing three-digit telephone numbers(911), and concentrated coordinated dispatching of police, fire, and restorative administrations for vast metropolitanareas.1972The National Institute of Justice starts an undertaking that prompts the advancement of lightweight, adaptable, and agreeable defensive body protective layer for the police. The body defensive layer is produced using Kevlar, a texture initially created to trade steel belting for spiral tires.

The delicate body protection presented by the Institutes credited with sparing the lives of in excess of 2,000police officers since its origin into the law authorization community.MID-1970s. The National Institute of Justice supports the Newton, Massachusetts, Police Department to evaluate the appropriateness of six models of night vision gadgets for law implementation utilize. The examination prompts the boundless utilization of night vision outfit by the present police agencies.1975Rockwell International introduces the main unique mark pursuer at the FBI. In 1979, the Royal Canadian Mounted Police actualizes the principal real programmed unique mark recognizable proof framework (AFIS).1980Police divisions start executing "enhanced"911, which enables dispatchers to see on their PC screens the addresses and phone numbers from which 911 crisis calls originated.1982Pepper shower, generally utilized by the police as a power elective, is first created.

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The wake of technology has created a variety of concerns for administration. Employee's privacy and intellectual property rights are progressively sited as real ones. With PC hacking overall guaranteeing secrecy of representative information is a developing concern, and obligation of an association in case of security ruptures is still unclear (Dessler 2008). Protecting intellectual property is imperative for all association particularly emerging technology and research and development. As a result organizations are developing electronic communication policies that clear outline permitted electronic activities, uses on employee systems and monitoring of employee files such as email. Numerous organizations have prohibited cell cameras and texting due to expanded danger of intellectual property theft.

Leaders of policing in the 21st century must survey the effect of all these innovation improvements. Today, officers and regular citizen law authorization representatives are looking for and expecting a workplace that advances innovation and the human ability. The general population considering professions in law authorization naturally expects an authoritative grasp of this fundamental. Offices that don't will frequently be rejected as outdated.

Law enforcement leaders may recall the profession's slow response to the reality of computer crimes in the early 1990s. Today, almost every crime has a digital component. So, too, agencies are shifting to a techno-savvy workforce, and their leaders should embrace the change and ensure a positive outcome for those they employ and those they serve.

Kenya has no specific provisions for crimes such as identity theft, cyber stalking, chat room abuse and impersonation (Munyua et al 2010). The Kenya communications (Amendments) Act 2013 fails to address cyber-crimes committed against the person.

Nonappearance of a reasonable connection between mechanical advancement and adequacy in policing may have various causes, specialized; legal and money related issues of different sorts can obviously restrict the effect of policing innovation. These incorporate designing issues whether the advances work, trouble in executing and utilizing the innovation, legitimate or authoritative points of confinement on innovation's utilization, absence of fit between the innovation and the assignments for which it is utilized, interdependencies between various advances, costs related with utilizing the innovation incorporates costs related with preparing, specialized help, and support and the disappointment of advances to give certain normal advantages like time reserve funds or expanded efficiency.

For Realizing the Potential of Technology in Policing thinks about with differing discoveries on these issues, for example Chan, 2003; Chan et al., 2001Colvin, 2001; Frank, Brandl, and Watkins, 1997; Ioimo and Aronson, 2004; Koper, Moore, and Roth, 2002; Koper and Roth, 2000; Kraemer and Danziger, 1984;Manning, 2008; Nunn, 1994; Nunn and Quintet, 2002; Roth et al., 2000; Zaworski 2004.(sea skate, inc.

20004),Fragmentation makes policing a regularly difficult to-achieve, hard-to-offer, and, along these lines, an unrewarding business sector for potential designers and makers of new innovations, items, and administrations. Getting an item and item data to the police market can be costly. Discontinuity implies most police divisions have little spending plans and make little purchases of hardware. All police offices burn through a large portion of their financial plans on work force and have moderately minimal left over for hardware buys.

Consequently, the neighborhood and state law requirement markets have insufficient accessible assets to help innovative work. Fracture implies gear procurement is normally on an office by-division premise; there is little pooled obtaining. Fracture implies mindfulness and data about profitable new advances saturate the center skill of police offices at notably unique rates. A few offices are best in class in innovative issues; some fall a very long time behind. Discontinuity implies neighboring police organizations purchase incongruent advancements strikingly in interchanges hardware which undermine their capacity to serve a typical region. The failure of a few abutting police divisions to convey in light of contrary radio hardware and frequencies is ordinary. Fracture implies all police organizations are too little to have on staff or accessible as needs be specialists who can give target assessments of proffered innovations. Policing has a lot of sad stories of costly advances, eminently PC frameworks, acquired in the shine of a salesperson's pitch and without an exhaustive examination of whether the innovation could convey what was guaranteed.

Fracture implies nobody has the specialist to build up norms for law requirement innovation and gear. The police without anyone else have built up no national association for this reason. Criminal equity has no national administrative organization. Wrongdoing research facilities are not required to experience accreditation.

**4.6 The effects of technology use on performance of police officers**

The study sought to examine the effects of technology use on performance of police officers.

### 4.6.1 Use of technology in detecting crimes

Ninety percent of the respondents had the opinion that technology has helped in detecting crime.

This was because intentions of the offenders could be detected even before the offence is committed; this is facilitated by the closed circuit television (CCTV) cameras which are fitted in major cities. One of the respondents noted that

> "*... The CCTV cameras located at major cities have helped very much in detecting and curbing crime, an example is an incident that happened in Nairobi city in 2017 where personnel at national police service headquarters Jogo house communication centre commonly known as IC3, noticed a gang of four men following a member of the public. They monitored them for a while and realised they were actually after the man, they alerted the personnel on the ground and managed to arrest the four, after they were arrested, crude weapons were recovered. That is just one of the cases of how offenders have been caught recently thanks to the new technology.....*"

Regardless of the frequent use of CCTV cameras, tracking of phones other technologies, 10% of the respondents seemed ignorant on the technology use in curbing and detecting crime. Most of those respondents in this category were the elderly respondents of the age between 51-60 years. One of those respondents had this to say during a focused group discussion,

> "*...police work is experience, the new generation is making the police work complicated, they should borrow some knowledge from the old folks...*"

Innovative headways have molded current policing in numerous vital ways. One need just consider that the essential police methodology for a great part of the twentieth century—mechanized preventive watch and quick reaction to calls for administration—was created in light of the development of the car, two-way

Radio communications and PC helped dispatch (911) frameworks. Later mechanical improvements have likewise had sweeping consequences for police organizations. Data

innovation (IT), video observation frameworks, DNA testing, and bullet resistant vests, for example, are currently normal and basic instruments in law authorization. Contemporary worries over country security and counterterrorism have made new innovative issues and requests for police, as has the development of PC related wrongdoing. Without a doubt, the late twentieth and mid-21st centuries have been times of especially fast mechanical change in policing. However while mechanical change is a crucial power in policing that holds incredible guarantee for improving the adequacy, decency, and even authenticity of police, generally little research has been done on the effects of innovation in policing past specialized, proficiency, or process assessments (Lum, 2010a).

Further, the exploration that is accessible recommends that innovation does not really convey foreseen advantages to police offices; sometimes, it might even have unintended unfortunate results (Byrne and Marx, 2011; Koper, Taylor, and Kubu, 2009; Lum, 2010a; Manning, 1992a). For instance, innovation may make more wastefulness in regular undertakings, have no effect on wrongdoing, or seclude the police from the network. Innovation can generously challenge authoritative culture, make changes in unit and work force connections and power structures, and modify capacities and reasons for the police. For these reasons, there is a need to all the more profoundly see how innovation influences police organizations (e.g., regarding their activities, structure, culture, adequacy, and authenticity) and how, thusly, different parts of police offices and their surroundings shape the utilizations and viability of policing innovation. Building up a superior comprehension of how and why advancements influence law requirement procedures and results—either decidedly or adversely—is basic to settling on cool headed choices about innovation appropriation and utilize.

### 4.6.2 Use of technology in investigating crimes

According to the study, 80% of the respondents were of the opinion that technology has helped in investigating crimes. Most of them cited the Deoxyribonucleic Acid (DNA) sampling which has been used in most of the rape cases. This has really helped in knowing the real offender. Other respondents cited the cyber-crimes where investigations have been made easier due to tracking devices used to establish where the offence was committed, the presence of the offender and offenders accomplishes. A respondent noted that the technology has helped in investigating crime but also could work for the disadvantage of the general public. He cited a case where a man was arrested for murder after having been found with a phone of the victim. The respondents had a deep discussion on that case and had the view that the man could be as well innocent. The burden of proofing his innocent could be very minimal.

Five percent of the respondents were of the view that use of technology does n help in investigating crime. These respondents were of the idea that technology is not needed to investigate a crime. They said that experience in police work is what is needed and the use of technology is not necessary.

Ten percent of the respondents were not even aware of technology use in investigations. Most of those respondents were mainly deployed in patrol duties. One of the respondents had this to say

> *".....if a criminal is arrested, let him be arraigned in court. That's the work of crime branch personnel...."*

Generally most of the respondents acknowledged the use of technology in investigating crime. The respondents noted that all police stations should equip with the latest gadgets to help in investigations. Most of the respondents had the opinion that cyber-crime units should be placed in every police division so that it would enhance crime investigations.

This findings corroborated with (Christopher, 2015) while essential utilization of IT and different advancements may have minor impacts in enhancing police effectiveness, identification abilities in the field, and officer wellbeing in reacting to calls, these upgrades may not the only one sufficient to noticeably improve police execution as

estimated by wrongdoing decrease or even case clearances. In fact, incline examination and field assessments neglected to discover proof of innovation enhancing police viability, no reasonable effect on wrongdoing rates and case clearances; officers' utilization of Technology in problem areas did not seem to upgrade the wrongdoing control adequacy of problem areas watch inward web based life innovation to improve data sharing on burglary cases produced little energy among criminologists and watch officers and had no effect on case clearances. These discoveries can be credited to a few variables (e.g., usefulness issues and specialized confinements, unintended wasteful aspects made by innovation, officer obstruction, mixed up presumptions about how certain advances will function, and unintended manners by which innovation may some of the time undermine officer adequacy), however they underscore the point that accomplishing more noteworthy increases with technology arguably requires more key employments of innovation for motivations behind avoidance and critical thinking.

Law requirement offices utilize an assortment of criminology advances to help them in the ID of criminal guilty parties. A standout amongst the most imperative upgrades to these capacities in ongoing decades has been the advancement of recognizable proof tests utilizing deoxyribonucleic corrosive, regularly known as DNA.

DNA tests recognize novel individual hereditary codes from DNA tests that are separated from organic proof, for example, blood, semen, hair, and spit. Created in the 1980s, understanding the Potential of Technology in Policing DNA testing has turned into a typical technique for recognizable proof, especially for sex crimes and other rough offenses, and it is generally seen as the best in class in wrongdoer ID (National Research Council, 2009). In the United States, DNA testing is for the most part utilized in rough wrongdoing cases because of its cost, yet its utilization for property violations is likewise growing (Roman et al., 2008).

Police may gather and utilize DNA proof in various ways. They may use DNA testing to decide if a specific suspect can be connected to physical proof from a specific wrongdoing scene. They may utilize recuperated DNA proof from a wrongdoing scene to distinguish suspects, however it appears that numerous organizations don't comprehend or exploit this potential DNA application (Strom et al., 2009).Finally, police and other

criminal equity offices take DNA tests from sentenced guilty parties and in a few states from arrestees to test them for matches to confirm from unsolved violations and for use in future examinations. The DNA Identification Act of 1994 approved the FBI to build up a national DNA database with files for people sentenced for violations, missing people (and relatives of missing people), tests recuperated from wrongdoing scenes, and tests recouped from unidentified human stays (Roman et al., 2008: 13-14). This national database is joined with state and neighborhood DNA databases in a framework named CODIS (for the Combined DNA Index System).By the late 1990s, every one of the 50 states had passed enactment requiring indicted wrongdoers to give DNA tests (Samuels, Davies, and Pope, 2013; Schwabe, 1999). Starting at 2009, 47 states gathered DNA tests from all indicted criminals and 37collected examples from those sentenced for specific offenses (DNA Resource, 2009, as referred to in Wilson, Weisburd, and McClure, 2011: 8). Moreover, 28 states have laws approving the accumulation of DNA proof from all or subsets of lawful offense arrestees (and some of the time from wrongdoing arrestees) preceding conviction (Samuels et al., 2013). The accumulation of DNA from arrestees has extended extensively since 2005 after government enactment taking into account such data to be transferred into CODIS.14 Nearly 10.4 million DNA profiles were in CODIS starting at 2011,up from 1.2 million out of 2002 (Samuels et al., 2013: 4). In spite of the fact that the accommodation of DNA from arrestees has been hindered in a few states by ongoing court cases testing the dependability of this strategy, the United States Supreme Court upheld the training on account of Maryland v. Ruler, which was chosen in June 2013.

In policing, the new managerialism has changed the traditional police compel into relationship with mission statements, techniques for progress, advancing frameworks and another complement on bad behavior organization, customer organization and execution measures (Chan 2001) think of it as the 'spearheading change' in policing. Under this new demand, police are being analyzed inside by organization systems, surveillance developments, internal surveys and examinations, and remotely by guard dog offices open disagreements structures and central overseers, and through the budgetary technique. Consequently, some bit of the help and upgrading of information development

in policing is proposed to meet the requirements for information under the new organization and duty systems (Chan 2001).

### 4.6.3 Technology use to prosecute criminal offenders

Eighty percent of the respondents did not know whether technology has helped in prosecution of criminal offenders. 10 % thought that it was of great help while 10% did not have an idea how technology can be used to prosecute offenders. Emerging use of information technology has great impact on criminal procedures related to the collection and presentation of digital evidence in court. Handling digital evidence has its shortcomings and requires specific guidelines as compared to physical evidence

On account of the today's technology, law enforcement officers can find lawbreakers fairly effortlessly, and ensure citizens. Deoxyribonucleic Corrosive (DNA) can be tested and is utilized for proof in crimes. Crime trackers are utilized to recognize crime-ridden territories and are utilized to distinguish where law authorization officers ought to be watching to guard citizens. There is a considerable measure of other technology utilized in law enforcement that citizens incredibly appreciate. This kind of technology is utilized to ensure or offer equity to individuals. This positive technology is constantly said thanks to and significantly appreciated by the residents of America.

Despite the fact that law authorization technology has constructive outcomes, it can likewise have negative impacts. Numerous individuals trust that law enforcement agents are snooping in their private business. Not as much as a year prior, officers were allowed the authorization to tap into peoples' mobile phones without a court order. This made a significant controversy. Many trust that it is inappropriate for officers to be permitted to listen in into their discussions. They trust they are being dealt with like crooks.

Periodically, citizens concur that police offices overstate when using technology. Sometimes technology that is intended to guard individuals can really transform into public safety issue. As of late, a discussion about robot rambles has surfaced. These automatons were made to keep surveillance and ensure that no dangers from terrorists are taken unnoticed. In spite of the fact that that is undoubtedly the expected utilize, many

are concerned that furnished automatons could murder an innocent person. Many contend that robots aren't ready to perceive when somebody is representing a danger or not. With each extraordinary, new innovation headway there will dependably be a con (Lexington Police Office Official Site).

These findings fortify the ideas that the impacts of technology in policing are bunch and complex and that advances in technology don't generally create evident or clear changes in understanding the Capability of technology in Policing efficiency, work fulfillment, or officers' viability in diminishing crimes and serving nationals. For sure, the utilization and effects of technology can be very factor both inside and across over offices as appeared by our officer review results. Actualizing technology successfully and utilizing it in the most ideal routes appear to be most testing at the line level in watch, however much can rely upon administration hones, organization culture, and other relevant variables. Further, wanted impacts from technology (like enhancing leeway rates and reducing wrongdoing) may set aside impressive opportunity to appear, on the off chance that they do by any stretch of the imagination, as organizations adjust to new advancements and refine their utilizations over time (Christopher, 2015).

The primary basic is technology-driven. Technology has dependably had a nearby liking with police work. In addition to the fact that technology promises to enhance police adequacy and effectiveness in controlling crime, it might likewise improve their professional status and hierarchical authenticity (Keeping an eye on 1992a; Ericson and Haggerty 1997, p. 390). Given that data is the stock-in-exchange of policing, it is characteristic that police associations would grasp the most recent data advancements. Police are putting resources into data technology to build their ability to store and process vast volumes of information; to enhance their knowledge and analytical capacities; and to give prepared access to criminal records and other crime related data. The requirement for that is perfect with different offices is additionally an imperative main thrust for new technology

### 4.7 Best strategies to help police officers adopt new technology

The study sought to identify best strategies of helping Kenya police officers adapt new technologies in order to improve their performance.

#### 4.7.1 Budgetary allocation of funds to national police service

The study found out that if the government of Kenya could allocate funds for the acquisition of updated equipment's then the performance of police officers would improve a lot. 66% of the respondents were of the opinion that budgetary allocations towards digitization of Kenya police service should be increased.

Police executive research forum (1996), noted that Technological advances are useful only if police agencies can afford them. That point is made in the results of a survey issued in 1996 by the Police Executive Research Forum (PERF).The PERF survey found, "In their efforts to improve the patrol function and maximize the impact of community policing programs, police nationwide are acquiring new technology designed to decrease response time and speed information dissemination." But the PERF survey also found that 83 percent of survey "respondents listed the high cost of acquiring these technologies as the primary deterrent in their past efforts to become better equipped." Other factors: "Twenty-five percent of respondents noted lack of information about available products as a significant factor. A smaller percentage of respondents also mentioned the complexity of the technologies and the need for more support from management as obstacles to new acquisitions. A case study included in the Forum's survey report illustrates how an agency benefits when it can afford to upgrade information technology. The Forum survey sampled 600 police agencies and had a 35 percent response rate. The case study summary says: Ten years ago, the Pinellas County (Florida) Sheriff's Office was working with an antiquated system of reporting, with four separate databases operating simultaneously and each serving limited purposes. As in most other police departments nationwide, police officers and detectives were bogged down with administrative detail and report writing, which cut down on their time on the streets (Richard, 2011). Today, the department is a model of efficiency. All four databases have been consolidated into one major network, and average report times have been cut from

35 to 40 minutes to ten minutes, essentially deploying officers from behind their desks to the communities where they are needed most. The office is nearly paper-free, operating on an intra-office e-mail system and the Augmented Criminal Investigative Support System (ACISS) database, which contains almost all relevant case information dating back ten years (Richard, 2011).

### 4.7.2 Enhanced curriculum at Police Training Colleges

Thirty percent of the respondents thought that inclusion of basic digital forensic skills in the police officer development training programs at police training colleges. 35% had the opinion that the entry level of police officers to be scaled up to the level of intellectual, investigative and technical skills to counter the complex nature of sophisticated current crimes.

The study found out that if the curriculum could include training on information technology skills, forensic investigation skills, evidence collection and preservation skills and then frequently re-train the officers on changing nature of technology then the police officers performance would greatly improve.

The government of Kenya should increase the allocation of funds to the national police service for the acquisition of updated equipment's then the performance of police officers would improve a lot.

Funding should be made available to provide and training at appropriate levels in forensic techniques and in technological skills for policy makers and law enforcement and investigative personnel. The Government should find ways of attracting high caliber technology specialists to work within law enforcement agencies.

### 47.3 Sensitization programmes

The national police service should initiate programmes to create awareness to police officers on the current cyber-crimes, use of computer systems, use of internet, use of soft ware's, and use of antivirus and possible counter measures of such cyber crimes

The government of Kenya should raise open public awareness, particularly among guardians and teachers; of the way those youngsters using the Internet might be presented to digital violations like improper recordings and photographs and that the technological way to square or channel such recordings and photographs are accessible. Network access providers ought to too expand the act of setting up hotlines to which the overall population can report hostile or unlawful substance of locales on the Internet before substance control can be controlled. Sites are blocked out and out by methods for oversight, as happens in nations where the Government controls web get to. Somewhere else, either Internet specialist co-ops or site managers can be held criminally at risk on the off chance that they intentionally circulate material that is viewed as illicit or destructive under any of the laws of the our nation.

## 4.8 Appropriate legislation to support the use of technology in national police service

The study sought to find out whether there was appropriate legislation to support use of technology in the national police service

It is basic that law enforcement agencies other national establishments in charge of battling Cyber-crimes be given the specialized and legislative means to build up appropriate response capacity. Be that as it may, this by itself isn't adequate. The study discovered that the difficulties to cyber-crime law requirement can likewise be met through agreeable associations including the legislature, the data innovation industry and nationals, whose different interests must be perceived and accommodated

### 4.8.1 Legislation to support use of technology

Sixty percent of the respondents were of the opinion that there was no legislation in Kenya to support use of technology in Kenya police service. 20% of the respondents said that there was legislation in support of use of technology in Kenya police service while 20% said they do not know whether there was any legislation to support the use of technology in the Kenya police service.

The study found out that the criminal procedure code in Kenya does not talk of the guidelines on prosecution of cyber-crime offenders; therefore it should be rectified to show clearly on how such offenders should be prosecuted. The police officers and prosecutors should be trained on how to handle digital evidence so as to understand the nature of technology based offending so as to be able to curb, detect and deter occurrence of such offences.

The International Narcotics Control Board report( 2000 ), noticed that the most earnest assignment facing Governments is guarantee that proper procedural and substantive laws are acquainted at the national level with manage crime submitted in an electronic situation. Exasperating elements could be presented when offenses are submitted in the internet. Measures ought to be orchestrated beyond what many would consider possible to guarantee that offenses, assents and gauges of verification are comparable in nations all through the world, with the end goal to keep the development of information shelters. Help ought to be given to creating nations considered in danger from such exploitation. Law authorization offices and legal experts ought to be given proper assets and gear to examine, distinguish, secure and arraign guilty parties who utilize new advancements in carrying out crime.

President of Kenya Uluru Kenyatta assented to the Computer and Cybercrimes Bill, 2017.The new law imposes hefty fines and long prison terms for cyber bullies and fake news dealers. It also targets journalists, media houses, social media users, bloggers and other internet users.

According to clause 12 of the law, publishing of false or fictitious information will attract a Sh5 million fine or a two-year jail term. A person who intentionally publishes false, misleading or fictitious data or misinforms with intent that the data shall be considered or acted upon as authentic, with or without any financial gain, commits an offence and shall, on conviction, be liable to a fine not exceeding five million shillings or to imprisonment for a term not exceeding two years, or to both," reads clause 12 of the new law.

The new law also allows authorities to search and seize stored computer data, and to collect and intercept data real-time. Computer hackers face a fine of Sh5 million shillings

or a three-year jail term or both for unauthorized access, interference, interception, and disclosure of passwords and cyber espionage.

In addition, the new law deals with computer forgery, fraud, cyber harassment, cyber-squatting, identity theft and impersonation, phishing, interception of electronic messages or money transfers, willful misdirection of electronic messages and fraudulent use of electronic data among other cyber-crimes.

The Act establishes the National Computer and Cybercrimes Coordination Committee and facilitates international co-operation in dealing with computer and cybercrime matters.(Computer and Cybercrimes Bill, 2017)The new legislation has however been faced by its own challenges Bloggers Association of Kenya moved to high court to obtain orders to suspend the cyber-crime law. The bloggers claimed that the cybercrime law seeks to reintroduce the purged laws while imposing harsher restrictions. The High Court temporarily suspended sections of the Cybercrime law.

As indicated by the bloggers, the debated law contains arrangements which deny, encroach and debilitate opportunity of articulation, media and people other than the privilege to protection, property and a reasonable hearing.

"It is in the general population intrigue that the coming into power of the Demonstration be remained pending the substantive hearing and assurance of this case," said Ms Mercy Mutemi for the bloggers.

In the case documents, the bloggers pointed out that a good number of Kenyans now draw their livelihood from content creation online and that there have been previous attempts by the government to clamp down freedom of expression in that platform. They alleged that Section 29 of the Kenya Information and Communication Act and Section 194 of the penal code were the ones famously used to punish freedom of expression offenders.

### 4.8.2 Trained Personnel involved in the implementation of technological advancement

Sixty four percent of the respondents did not know whether the personnel involved in the implementation e of technological advancement were adequately trained. Thirty percent of the respondents were of the opinion that they are not adequately and sixteen percent said that they were trained.

The respondents felt that most of the ones who get training majorly through their own private studies always exit police service due to poor remunerations and poor conditions of work.

New technologies can offer police many useful methods for combating criminal activity, with such tools as GPS and advanced communications systems. Technologies such as body armor and less-lethal projectiles also improve the safety of both police and the public. However, in an increasingly high-tech world, more and more crimes involve technologies and police must be prepared for them.

According to NIJ, 2014, National institute of justice sponsors a broad array of research and development of equipment and technology for police. Its research priorities are based on the needs of the law enforcement community. NIJ both creates new technologies and evaluates technologies on the market for effectiveness and safety. Its evaluation programs are often conducted in real-world environments in partnership with local law enforcement and other outside entities. NIJ is also central in the development of standards for new technologies, such as ballistics standards for body armor.

NIJ is committed to helping make new equipment and technology available to police throughout the country. Through outreach programs, NIJ introduces police to new tools and offers a variety of training programs on new technologies. NIJ also provides ongoing technology assistance for police using advanced communications equipment (NIJ, 2014).

### 4.8.3 Involvement of staff in decision making

The study sought to find out whether the organization involves other staff in making decisions on the right technology to adopt According to the findings a hundred percent of employees agreed that the management involves other staff in making decisions .on the right technology to adopt. This implies that the organization values democracy and this is important for the motivation of employees which may lead to improved performance.

Hough, (1980) noticed that law requirement officers settle on basic operational choices consistently. They endeavor to settle on the best choices for the situation yet there are those in your organization who make you feel like regardless of what choice you make, it's never the correct one. Shockingly, that settles on us question if the choice made was the correct one, and that could prompt second-speculating future choices.

The accompanying contemplations ought to be settled on while settling on operational choices in policing it is never about you. Operational choices ought to never be made in light of your very own prosperity. You have representatives who you lead and they rely on you to settle on the correct choice, not settle on the choice that advantages you as a person. Settling on the best choice that advantages the entire is the objective consistently. You need to think all around, you should consider the entire picture.

When you settle on choices dependent on part of an issue, that choice will never be the best. We grumble that media and society makes a decision about us on a little scrap of a recorded occasion, at that point for what reason would we basically do a similar thing? Get the entire image of the issue and settle on an educated choice. Settle on the correct choice for the correct reasons. This is the hard choice to make since it may not be the famous choice. This is the choice that keeps you up throughout the night, and may isolate you from your workers. Settle on the choice that you know to be correct, regardless of whether that choice means discipline for a worker or more awful, a companion. You should have the capacity to take a gander at yourself in the mirror and know you settled on the correct choice. Administration isn't a notoriety challenge, gain the title of a pioneer and make the best choice, simply don't give it a chance to be the political thing. The necessities of the network can direct a choice .Your office is there to secure the residents

in your locale. In the event that there are network issues waiting be tended to, just tossing extra time at the issue isn't compelling. Settle on choices that deliver dependable outcomes not just developing representative's ledgers.

On the off chance that battles are heightening after school discharge and your officers are changing movements around then, at that point altering shift hours or making early autos to take into consideration police nearness and discouragement of battles is a case of network contemplations in making alterations, or how you appoint your officers on shifts (regular clothes versus garbs). Keep in mind that each choice you make has a man appended to it .Think about this as a stone being tossed into a waterway. The swells are issues that keep on streaming outward and influence different things. At the end of the day, choices you make resemble the rock. For instance, in the event that you need to move an officer's day of work because of labor issues, at that point consider the way that he or she has a family that relies on a steady timetable. An authority choice is offer lenient gestures to suit any capacities they were booked to go to if conceivable. The worker's family is a piece of the organization family too. Try not to pass judgment on the outcome judge the way to the outcome. A glaring model here would get political strain to teach a representative who did not damage approach and dealt with the circumstance as well as can be expected, however the outcome was not what we sought after. Keep in mind that we can't ensure a particular outcome; we can just ensure there will be an outcome.

The most imperative thing is deciding the procedure the officers used to achieve the outcome. On the off chance that the organization procedure is defective at that point return to it and revise it to be more powerful, yet don't rebuff the representative for that. They didn't make the issue; they essentially pursued the office's order.

Results neither are now and then not pretty but rather nor are police work. We can just control what we can control. I realize that sounds antique yet its actual. We can get ready for each possible circumstance yet a suspect can and will change the circumstance in a moment or two and we need to respond! Restraining a representative for a completely flawless process yet not all that pretty outcome unfavorably influences the officer, as well as the officer's family, individual workers and the network.

In settling on operational choices, everything necessary is administration that thinks about making the best decision for everybody, including representatives, city authority, worker relatives and the network (Hough, 1980).

# CHAPTER FIVE

# SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

## 5.1 Introduction

This chapter presents the summary of the findings and conclusions in relation to the objectives of study. It gives the relevance of the findings and recommendations to address the problems revealed by the study. It also contains suggested areas for further research.

## 5.2 Summary of findings

The purpose of this study was to assess the implications of technological advancement on performance of police officers and suggest the best ways to enhance technological use in the police service. objectives of the study was to establish the preference use of new technology in the Kenya police service, to examine the types of technology used in the Kenya police service, to identify challenges that Kenyan police officers face in the use of new technologies, to examine effects of technology on performance of police officers and to identify the best strategies of helping Kenyan police officers adapt new technologies to improve their performance.

To understand the questions raised by the above objectives well, it was important to first understand the background information of the respondents. The study then began to analyze the demographic characteristics of the respondents. It was established that the respondents were police officers based at Kenya Railways Police Unit. Males were the majority and females the minority. The respondents comprised of university graduates and officers who had college education with deeper analysis it was established that the characteristics could be factored in the strategies of implementing technological advancement in Kenya police service.

On the technologies used in Kenya police service, respondents noted that pocket phones were the most used in Kenya police service at sixty percent followed by computers at twenty percent CCTV cameras at ten percent and in-vehicle computers at five percent and use of apps that can alert officer's locations of known criminal offenders at five percent.

Computer use being at twenty percent, respondents noted that police stations have computers only at the records offices. Most offices which include crime office, report office, traffic office, and armoury lack computers. The study found out that reports made by members of the public are written in occurrence books which are manual. Once the occurrence book is filled up it is stored in other offices. This is a risk in that it can get lost at some point and all the information inside gets lost. The respondents noted that if reports at the report office could be recorded manually and later typed and stored in computers with software which can send the same to a central office within the Kenya police headquarters and then stored in a hard disk then safety of police information would be guaranteed.

CCTV Cameras came at ten percent; the respondents noted that the available CCTV Cameras are available in buildings other than the police stations. The cameras help very much in identifying offenders, detecting crime and curbing the same.

The second objective which was to identify the challenges that Kenya police service officers face in the use of new technologies According to the study, fifty two percent of the respondents noted that lack of funds to acquire updated equipment's was a major challenge facing police officers in their effort to adopt new technology. Senior officers noted that the funds allocated to police divisions are never enough to afford modern equipment's. Cyber forensic equipment's are expensive to acquire a contributing challenge in adopting new technology. Most of the cyber-crimes cannot be properly investigated without essential equipment's and training on both software and hardware.

The study found out that, due to fast technological advancements the digital forensic tools become obsolete too often. Forty percent of the respondents had the view that this has become a major challenge because they are expensive and the budget allocation to acquire them is limited.

Twenty two percent of the respondents noted that lack of motivation in terms of welfare of police officers remains to be a challenge. Ten percent of the respondents noted that lack of specialized training is also a challenge that is facing police officers in adopting new technology. One of the respondents noted that the training done to police officers on

initial training was shallow and did not cover technical knowledge on sophisticated crimes such as cyber-crime. Most of the officers who are deployed in investigating sophisticated crimes mainly gained the knowledge through their own private studies which are self-sponsored.

A respondent at director of criminal investigation Railways headquarters noted that police officers at railways police unit and other parts of the country had received various crime reports which entailed use of sophisticated technology but due to lack of specialized training on these areas they could neither handle the offences nor offer advice to the complainants. They find themselves referring them to cyber-crime unit. This leads to low confidence to police from members of the public.

The study discovered that at some instances, whenever the evidence was acquired, the data with evidential value was quite quantitative and required large storage capacity devices of which were costly and not always available to the disposal of the officers. This made it cumbersome and time consuming to analyze the digital evidence. Thirty of the respondents cited this occurrence as a rare occurrence. Forty percent of the respondents citing it as very rare ten percent cited it as often.

Unemployment of techno-savvy personnel was seen a major challenge in adopting technology in Kenya police service. Fifty four percent of the respondents cited that while conducting recruitment of police officers, there is no a consideration of which courses one undertook in the case of graduates. This leads to eliminating techno-savvy individuals just because they are not good athletes per say. Job placement being poor was also seen as a challenge in adopting technology.

On the third objective which was to examine the effects of technology on performance of police officers ninety percent of the respondents had the opinion that technology has helped in detecting crime.

This was because intentions of the offenders could be detected even before the offence is committed; this is facilitated by the closed circuit television (CCTV) cameras which are fitted in major cities.

According to the study eighty percent of the respondents were of the opinion that technology has helped in investigating crimes. Most of them cited the Deoxyribonucleic Acid (DNA) sampling which has been used in most of the rape cases. This has really helped in knowing the real offender. Other respondents cited the cyber-crimes where investigations have been made easier due to tracking devices used to establish where the offence was committed, the presence of the offender and offenders accomplishes.

Five percent of the respondents were of the view that use of technology does n help in investigating crime. These respondents were of the idea that technology is not needed to investigate a crime. They said that experience in police work is what is needed and the use of technology is not necessary.

Ten percent of the respondents were not even aware of technology use in investigations. Most of those respondents were mainly deployed in patrol duties.

Generally most of the respondents acknowledged the use of technology in investigating crime. The respondents noted that all police stations should equip with the latest gadgets to help in investigations. Most of the respondents had the opinion that cybercrime units should be placed in every police division so that it would enhance crime investigations.

Eighty percent of the respondents did not know whether technology has helped in prosecution of criminal offenders. Ten percent thought that it was of great help while 10% did not have an idea how technology can be used to prosecute offenders.

Emerging use of information technology has great impact on criminal procedures related to the collection and presentation of digital evidence in court. Handling digital evidence has its shortcomings and requires specific guidelines as compared to physical evidence

### 5.3 Conclusion

The study discovered the performance of police officers has greatly improved due to advancement of technology. Specifically the study established that there was use of technology in Kenya police service though not very much advanced.

Advanced telecommunication technologies constitute the motor of today's globalized economy and, as such, cannot be held back from expansion and technological evolution, nor is it desirable that they should. It must be recognized, however, that Globalization and new technologies have facilitated certain cyber-criminal operations, thereby placing an additional burden on law enforcement agencies. Although collaboration between industry and law enforcement is often good, inevitably, the public and private agenda do not always coincide, since companies have a duty to protect the privacy of their customers and the profits of their shareholders.

It is essential that law enforcement agencies other national institutions responsible for fighting Cyber-crimes be given the technical and legislative means to develop an appropriate response capacity. But this alone is not sufficient. The study found out that that the challenges to cyber-crime law enforcement can also be met through cooperative partnerships involving the government, the information technology industry and citizens, whose separate interests must be recognized and reconciled.

The need for law enforcement structures to modernize and to adapt to changing circumstances and new challenges has become more acute. New technologies should be seen not as an enemy in the fight against technology related crimes, but as potential tools in the prevention of the same.

The study noted that there is wide range of efforts under way to tackle the threat of cyber-crime in general. Current initiatives regarding cyber-crime focus primarily on child pornography and economic crimes such as fraud, hacking and theft of intellectual property.

### 5.4 Recommendations

The following actions were recommended, which if adopted will improve performance of police officers in terms of detection, investigation and prevention of crime. This will benefit the entire Kenya police service fraternity. It will also be of help to members of the public who will enjoy the benefits of a safe nation.

1. The government of Kenya should increase the allocation of funds to the National Police Service for the acquisition of updated equipment's then the performance of police officers would improve a lot. Funding should be made available to provide and training at appropriate levels in forensic techniques and in technological skills for policy makers and law enforcement and investigative personnel. The Government should find ways of attracting high caliber technology specialists to work within law enforcement agencies.
2. The Kenyan Government should ensure that proper procedural and substantive laws reintroduced to manage wrongdoings submitted in an electronic situation. Law requirement offices ought to be furnished with basic framework security to shield their data and knowledge databases from digital assault. National police administration ought to present particular wrongdoing units at the district level. These units ought to keep up helpful courses of action with different organizations against digital wrongdoing.
3. The legislature ought to guarantee that law authorization offices and legal experts are given fitting assets and hardware to explore, recognize, catch and indict guilty parties who utilize new innovations in carrying out innovation related violations. The administration of Kenya should raise open mindfulness, particularly among guardians and instructors; of the way those youngsters utilizing the Web might be presented to digital wrongdoings like unseemly recordings and photographs and that the innovative way to square or channel such recordings and photographs are accessible. Network access suppliers ought to too broaden the act of setting up hotlines to which the overall population can report hostile or illicit substance of locales on the Web
4. The examination discovered that if the educational programs could incorporate preparing on data innovation aptitudes, measurable examination abilities, proof accumulation and safeguarding aptitudes and afterward often re-prepare the officers on changing nature of innovation then the law enforcer's execution would significantly move forward.
5. The national police administration should start sharpening projects to make attention to cops on the current digital wrongdoings, utilization of PC frameworks, utilization of

web, utilization of software's, and utilization of antivirus and conceivable counter proportions of such digital violations

## 5.5 Areas for further study

- To determine the relationship between use of technology in police service and public satisfaction.
- To establish whether the members of the public contribute to the prevalence use of technology in Kenya police service
- To identify the effectiveness of technologies used in Kenya police service in relation to crime investigation

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**APPENDIX I: WORK PLAN**

| | MAY 2017 | JUNE 2017 | JULY 2017 | AUGUST 2017 | SEP 2017 | DEC 2017 | JAN 2018 |
|---|---|---|---|---|---|---|---|
| Consolidation of literature | | | | | | | |
| Proposal writing | | | | | | | |
| Questionnaire development | | | | | | | |
| Defense of Proposal and submission | | | | | | | |
| Data Collection | | | | | | | |
| Data Analysis | | | | | | | |
| Report Writing | | | | | | | |
| Report Submission | | | | | | | |

**APPENDIX II: INTRODUCTORY LETTER**

Dear Sir/madam

My name is Rachael; I am a student at Kenyatta University (masters in security management and police studies). As part of the requirements of the course, I am required to undertake a research project in my area of study. My research topic is on the implications of technological advancements on performance of police officers, case of Kenya Railways Police Unit. You are selected as one of my respondents in my project Proposal. Your sincere and correct answers will be important in attaining this goal. All information will be treated with utmost confidentiality.

Yours faithfully

Rachael

## APPENDIX III: RESEARCH AUTHORIZATION 1

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**GRADUATE SCHOOL**

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**Our Ref: C159/CTY/PT/29688/14** **DATE: 10th October, 2017**

Director General,
National Commission for Science, Technology
and Innovation
P.O. Box 30623-00100
**NAIROBI**

Dear Sir/Madam,

**RE: RESEARCH AUTHORIZATION FOR RACHAEL NDINDA NDONYE – REG. NO. C159/CTY/PT/29688/14.**

I write to introduce Ms. Rachael Ndinda Ndonye who is a Postgraduate Student of this University. She is registered for M.A degree programme in the **Department of Security and Correction Science.**

Ms. Rachael Ndinda intends to conduct research for a M.A Project Proposal entitled, **"Implications of Technological Advancements on Performance of Police Officers; Case of Kenya Railways Police Unit".**

Any assistance given will be highly appreciated.

Yours faithfully,

**MRS. LUCY N. MBAABU**
**FOR: DEAN, GRADUATE SCHOOL**

**AM/lnn**

## APPENDIX IV: RESARCH PERMIT

### CONDITIONS

1. The License is valid for the proposed research, research site specified period.
2. Both the Licence and any rights thereunder are non-transferable.
3. Upon request of the Commission, the Licensee shall submit a progress report.
4. The Licensee shall report to the County Director of Education and County Governor in the area of research before commencement of the research.
5. Excavation, filming and collection of specimens are subject to further permissions from relevant Government agencies.
6. This Licence does not give authority to transfer research materials.
7. The Licensee shall submit two (2) hard copies and upload a soft copy of their final report.
8. The Commission reserves the right to modify the conditions of this Licence including its cancellation without prior notice.

REPUBLIC OF KENYA

National Commission for Science, Technology and Innovation

**RESEARCH CLEARANCE PERMIT**

Serial No.A 16495

CONDITIONS: see back page

THIS IS TO CERTIFY THAT:
*MS. RACHAEL NDINDA NDONYE*
of KENYATTA UNIVERSITY, 260-90300 MAKUENI,has been permitted to conduct research in *Nairobi County*

on the topic: *IMPLICATIONS OF TECHNOLOGICAL ADVANCEMENTS ON PERFORMANCE OF POLICE OFFICERS,CASE OF RAILWAYS POLICE UNIT*

for the period ending:
*14th November,2018*

Permit No : NACOSTI/P/17/63221/20035
Date Of Issue : 15th November,2017
Fee Recieved :Ksh 1000

.....
*Applicant's Signature*

.....
*Director General*
*National Commission for Science, Technology & Innovation*

## APPENDIX V: RESEARCH AUTHORIZATION FROM NACOSTI


**NATIONAL COMMISSION FORSCIENCE, TECHNOLOGY ANDINNOVATION**

Telephone:+254-20-2213471,
2241349,3310571,2219420
Fax: +254-20-318245,318249
Email: dg@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

6th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA


Ref No. **NACOSTI/P/17/63221/20035** Date: **15th November, 2017**

Rachael Ndinda Ndonye
Kenyatta University
P.O Box 43844-00100
**NAIROBI.**

**RE: RESEARCH AUTHORIZATION**

Following your application for authority to carry out research on ***"Implications of technological advancements on performance of police officers, case of railways police unit"*** I am pleased to inform you that you have been authorized to undertake research in **Nairobi County** for the period ending **14th November, 2018.**

You are advised to report to **the County Commissioner & the County Director of Education, Nairobi County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

**GODFREY P. KALERWA MSc., MBA, MKIM**
**FOR: DIRECTOR-GENERAL/CEO**

Copy to:

The County Commissioner
Nairobi County.

COUNTY COMMISSIONER
NAIROBI COUNTY
P. O. Box 30124-00100, NBI
TEL: 341666

The County Director of Education
Nairobi County.

**APPENDIX VI: RESEARCH AUTHORIZATION FROM MINISTRY OF EDUCATION**

Republic of Kenya
MINISTY OF EDUCATION
STATE DEPARTMENT OF BASIC EDUCATION

Telegrams: "SCHOOLING", Nairobi
Telephone: Nairobi 020 2453699
Email: rrenairobi@gmail.com
cdenairobi@gmail.com

When replying please quote

REGIONAL COORDINATOR OF EDUCATION
NAIROBI REGION
NYAYO HOUSE
P.O. Box 74629 – 00200
NAIROBI

Ref: **RCE/NRB/GEN/1 VOL. I**

DATE: **19th December, 2017**

Rachael Ndinda Ndonye
Kenyatta University
P O Box 43844-00100
**NAIROBI**

**RE: RESEARCH AUTHORIZATION**

We are in receipt of a letter from the National Commission for Science, Technology and Innovation regarding research authorization in Nairobi County on "**Implications of technological advancements on performance of police officers, case of railways police unit** ".

This office has no objection and authority is hereby granted for a period ending **14th November, 2018** as indicated in the request letter.

Kindly inform the Sub County Director of Education of the Sub County you intend to visit.

19 DEC 2017

**RHODA MWEI**
**FOR: REGIONAL COORDINATOR OF EDUCATION**
**NAIROBI**

C.C
Director General/CEO
Nation Commission for Science, Technology and Innovation
**NAIROBI**

**APPENDICES VII: TOOLS FOR DATA COLLECTION**

SECTION 1

- **POLICE OFFICERS BELOW THE RANK OF INSPECTOR**
- Constables
- Corporals
- Sergeants
- Senior sergeant

Instructions: please use ( ) and (;) where necessary

Section 1: Demographic Information

- What is your sex?(tick appropriately)

Male [ ] Female [ ]

- Kindly tick the age group that you belong to.

20- 30 years [ ] 31-40 years [ ]

41-50 years [ ] 51-60 years [ ]

- Kindly tick the level of education that you reached.

Primary [ ] College [ ]

Secondary [ ] Universities[ ]

- Tick the functional department that you work in at Kenya police service.

Administration [ ] general duties [ ]

Crime investigations [ ] Records [ ] Operations [ ] Human resource [ ]

Section 2: kindly tick technologies used in the Kenya police service among the following.

Pocket phones [ ] computers [ ] Body cameras [ ] In-vehicle computers [ ]

License plate readers [ ] CCTV Cameras [ ]

Facial recognition technologies mobile consoles for fingerprint reading [ ]

Use of map-based apps that can alert officers locations of known criminal offenders [ ]

- In your opinion, has the adoption of technology benefitted you at Kenya police?

Yes [ ] No [ ] Don't Know [ ]

If yes, explain using the responses in the table below.

| | Strongly Agree | Agree | Not Sure | Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| It has Improved accuracy | | | | | |
| Improved Speed of case investigations | | | | | |
| Improved communication in the organization | | | | | |
| Reduced response time | | | | | |
| Improved Motivation | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| to perform duties | | | | | |

- Are there areas where the adoption of technology has negatively affected police officers
  performance?.....
  .....
  .....
  .....

Section 3: what types of technologies are used in Kenya police service?

- In your opinion what are the types of technologies used in Kenya police service?

.....
.....
.....
.....

Sections 4.what are the challenges police officers face in adopting new technology?

- In your opinion, are there challenges encountered in the adoption of technology at Kenya police/ tick appropriately

Yes [ ] No [ ] Don't Know [ ]

- If yes, how often are the following challenges encountered at Kenya police in adopting new technology?

| | Very often | Often | Not Sure | Rare | Very rare |
|---|---|---|---|---|---|
| Lack of specialized training of police officers | | | | | |
| Lack of tools and equipment | | | | | |
| Weak cyber-crime laws | | | | | |

- Does the management involve other staff in making decisions on the right technology to adopt?

Yes [ ] No [ ] Don't Know [ ]

- How do you over Come these challenges?

Section 5: What is the effect of technology use on performance of police officers?

- Has it helped in detecting crime?

  Yes [ ] No [ ] don't know [ ]

  Elaborate depending on your answer

  .....

  .....

  .....

- Has technology helped in investigating crime?

  Yes [ ] No [ ] don't know [ ]

- Has technology helped to prosecute criminal offenders?

Yes [ ] No [ ] don't know [ ]

- What your general view is as pertains to technology and performance of police officers?

  ……

  ……

  ……

Section 6: which best strategies in your opinion can help police officers adopt new technology?

……

……

……

- In your opinion, is there appropriate legislation to support the use of technology in National Police Service? Tick appropriately

Yes [ ] No [ ] don't know [ ]

- In your opinion, are there adequate budgetary allocations to support implementation of technological strategies in national police service?

Yes [ ] No [ ] don't know [ ]

- In your opinion, are the personnel involved in the implementation of technological advancement adequately trained for the role?

Yes [ ] No [ ] don't know [ }

SECTION II:SENIOR POLICE OFFICERS ABOVE THE RANK OF INSPECTOR

- **INSPECTOR GENERAL (AIG)**
- Senior superintendent of police (SSP)
- Superintended of police (SP)
- Chief inspectors (C.I)
- Inspectors of Police(IP)

(Tick appropriately)

- In your opinion, is there appropriate legislation to support the use of technology in security management in Kenya?

Yes { } No { }

- In your opinion, are there personnel involved in the implementation of technological advancements in Kenya police service?

  Yes { } No { }

- In your opinion, are there adequate budgetary allocations to support implementation of technological advancements in Kenya police service?

  Yes { } No { }

- Can we attribute the reduction/ increase in crime rates to deployment of technology?

  Yes { } No { }

- What other factors have contributed to police performance in reduction of crime in Kenya?
  - _____
  - _____
  - _____
  - _____
- What strategies have the Kenya police adopted in implementation of technological advancements?

  .....

  .....

**END OF QUESTIONARE**

**APPENDIX VIII: GUIDED INTERVIEW FOR POLICE OFFICERS WITHIN KENYA RAILWAYS POLICE UNIT**

**Introduction**

**Dear Respondent,**

My name is Rachael Ndonye, a post graduate student at Kenyatta University. You have been selected to participate in this Interview meant to collect data for a master's degree. My research topic is on the implications of technological advancements on performance of police officers, case of Kenya Railways Police Unit. Your sincere and correct answers will be important in attaining this goal. All information will be treated with utmost confidentiality. Thank you.

**Particulars of the Respondents**

Interview guide NO ----------Date ----------

Location of interview----------

Age of the respondent ----------

Respondents' education level ----------

- **The functional department that you work in at Kenya police service.**

Administration [ ] general duties [ ]

Crime investigations [ ] Records [ ] Operations [ ]
Human resource [ ]

- **Technologies used in the Kenya police service among the following.**

Pocket phones [ ] computers [ ] Body cameras [ ] In-vehicle computers [ ]

License plate readers [ ] CCTV Cameras [ ]

Facial recognition technologies mobile consoles for fingerprint reading [ ]

Use of map-based apps that can alert officers locations of known criminal offenders [ ]

- **In your opinion, has the adoption of technology benefitted you at Kenya police?**

Are there areas where the adoption of technology has negatively affected police officers performance?

- **Types of technologies are used in Kenya police service?**

In your opinion what are the types of technologies used in Kenya police service?

- **What are the challenges police officers face in adopting new technology?**

In your opinion, are there challenges encountered in the adoption of technology at Kenya police

How do you over Come these challenges?

- **Does the management involve other staff in making decisions on the right technology to adopt?**]
- **What is the effect of technology use on performance of police officers?**
    - Has it helped in detecting crime? Elaborate depending on your answer .....

    .Has technology helped in investigating crime?
    - Has technology helped to prosecute criminal offenders?
- **What your general view is as pertains to technology and performance of police officers?**
- **Which best strategies in your opinion can help police officers adopt new technology**?
- In your opinion, is there appropriate legislation to support the use of technology in National Police Service?
- In your opinion, are there adequate budgetary allocations to support implementation of technological strategies in national police service?
- In your opinion, are the personnel involved in the implementation of technological advancement adequately trained for the role?

## APPENDIX IX: KENYA RAILWAY POLICE UNIT, FOCUSED GROUP DISCUSSION GUIDE

### Introduction

**Dear Respondent,**

My name is Rachael Ndonye, a post graduate student at Kenyatta University. You have been selected to participate in this focus group discussion meant to collect data. My research topic is on the implications of technological advancements on performance of police officers, case of Kenya Railways Police Unit. Your sincere and correct answers will be important in attaining this goal. All information will be treated with utmost confidentiality. Thank you.

(Opening remarks by the researcher)

### Discussion topics

- The areas where the adoption of technology has negatively affected police officers performance
- Types of technologies used in Kenya police service
- The challenges police officers face in adopting new technology
- Does the management involve other staff in making decisions on the right technology to adopt?
- The effects of technology use on performance of police officers
- Has technology helped in detecting crime, investigating and prosecuting criminal offenders
- What your general view is as pertains to technology and performance of police officers?
- Which best strategies in your opinion can help police officers adopt new technology?
- Is there appropriate legislation to support the use of technology in National Police Service?
- In your opinion, are there adequate budgetary allocations to support implementation of technological strategies in national police service?

- Are the personnel involved in the implementation of technological advancement adequately trained for the role?
- What other factors have contributed to police performance in reduction of crime in Kenya?
- What strategies have the Kenya police adopted in implementation of technological advancements?