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*Ngumbi, D. N.*

*Faculty of Information Technology (FIT)  
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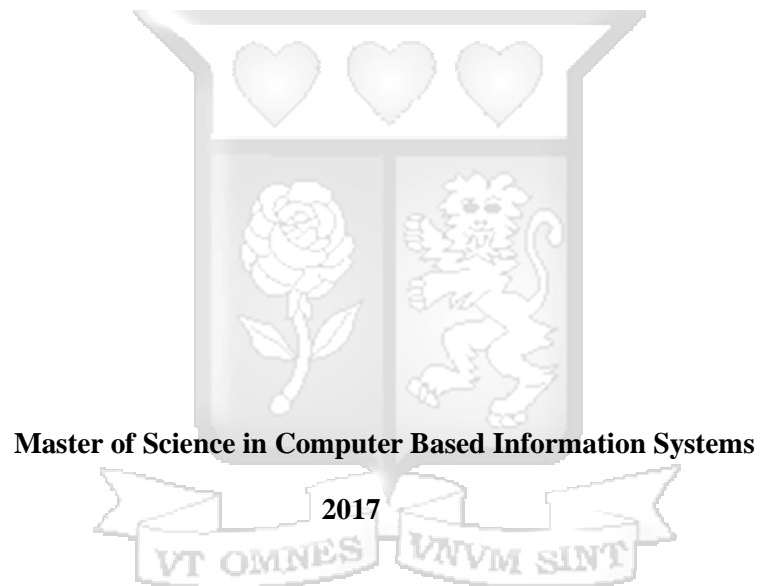
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**A Model for Vehicle Tracking and Monitoring Systems Adoption in the Kenya Police  
Service**

**Ngumbi Damaris Ndunge**

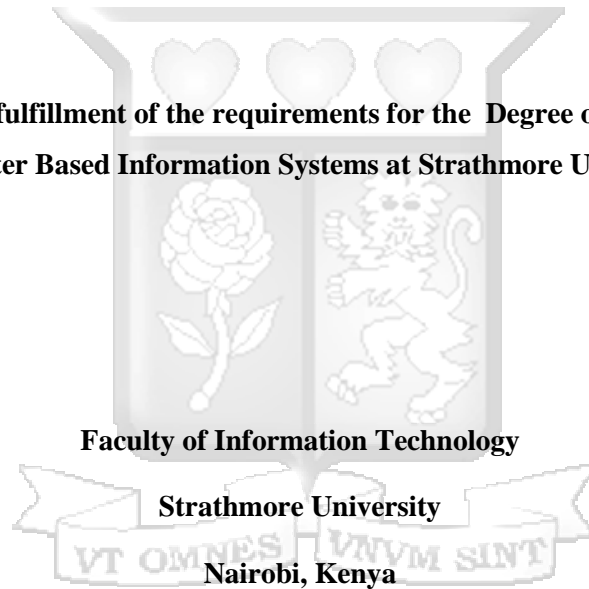


**Master of Science in Computer Based Information Systems**

**A Model for Vehicle Tracking and Monitoring Systems Adoption in the Kenya Police  
Service**

**Ngumbi Damaris Ndunge**

**Submitted in partial fulfillment of the requirements for the Degree of Master of Science in  
Computer Based Information Systems at Strathmore University**



**June, 2016**

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Ngumbi Damaris Ndunge

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**Approval**

The thesis of Ngumbi Damaris Ndunge was reviewed and approved by the following:

Dr. Bernard Shibwabo

Faculty of Information Technology

Strathmore University

Dr. Joseph Orero

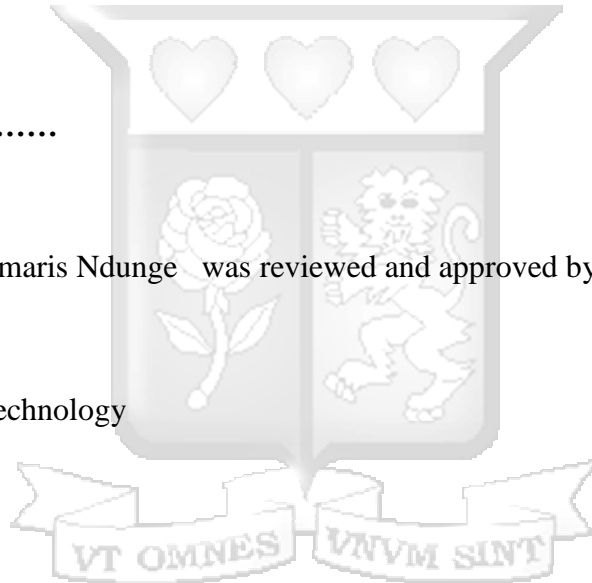
Dean of Faculty

Faculty of Information Technology

Prof. Ruth Kiraka

Dean

School of Graduate Studies



## Abstract

The presence of police patrol cars in Kenya has not increased as it was expected in the wake of the leasing of hundreds of emergency response vehicles to the police in 2014. Rogue police officers use police cars for personal errands. The police vehicles are sometimes fuelled at stations authorized by the Kenya police service on the pretext that they are on official duty. Efficient use of police resources and transparency has been a top agenda of police reforms in Kenya. It is for this reason that this research sought to establish the extent of vehicle tracking and monitoring systems adoption in the Kenyan police service. This research used explanatory research design. The population of this research consisted of all the 110 police stations and police posts in Nairobi County. A sample of 57 police stations and police posts was selected. The research used primary data that was collected by use of questionnaires. The research used both descriptive statistics and inferential statistics in the analysis. The study further conducted structural modeling analysis using the partial least square to validate the proposed model. SPSS-AMOS was used for data analysis.

The results of this study showed that technology awareness, environmental factors, financial resources and technological complexity significantly affected both perceived usefulness and perceived ease of use of vehicle tracking and monitoring systems. The findings further showed that perceived usefulness had a positive and significant relationship with intention to use the vehicle tracking and monitoring systems. The proposed model comprised of four dimensions technology awareness, environmental context, financial resources and Technological complexity. Validity tests proved that the variables in the model were significant in explaining the behavioral perceived usefulness and perceived ease of use of police towards vehicle tracking and monitoring systems use. Perceived Usefulness and Perceived Ease of Use were also significant in explaining the behavioral intention to use of police towards vehicle tracking and monitoring systems use. The final model accounted for a significant variance of behavioral intention towards vehicle tracking and monitoring systems use. The study also recommends that the Kenya police service should train their officers on the vehicle tracking and monitoring systems and also allocate funds in their budget to implement the installation and training on tracking and monitoring systems.

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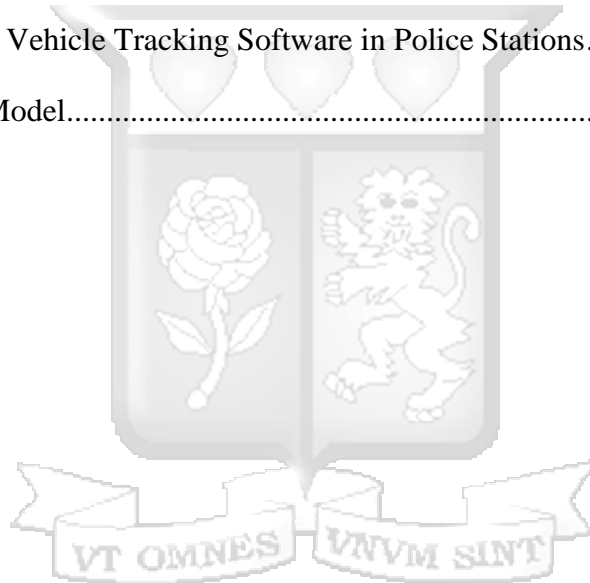
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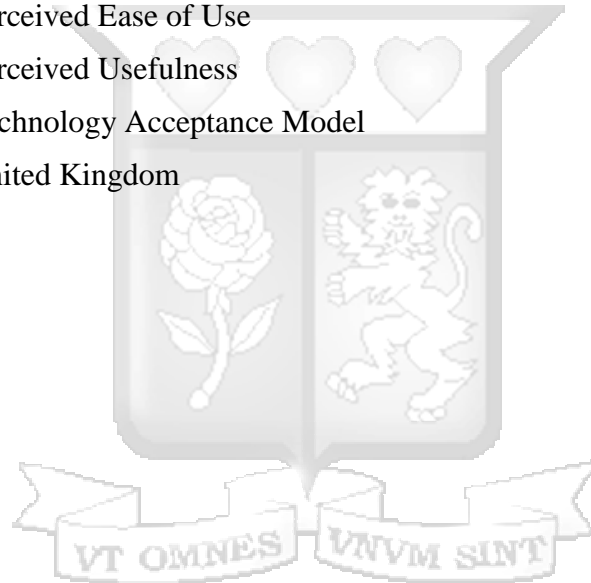


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## List of abbreviations

<b>AVL</b>	Automatic Vehicle Location
<b>CASD</b>	Computer Aided Scheduling Dispatch
<b>FMCG</b>	Fast Moving Consumer Goods
<b>GIS</b>	Global Information System
<b>GPS</b>	Global Positioning System
<b>GSM</b>	Global System Mobile
<b>ICT</b>	Internet Communication Technology
<b>KDF</b>	Kenya Defense Forces
<b>MDT</b>	Mobile Data Terminals
<b>PEOU</b>	Perceived Ease of Use
<b>PU</b>	Perceived Usefulness
<b>TAM</b>	Technology Acceptance Model
<b>UK</b>	United Kingdom



## Acknowledgements

I would like to express my gratitude to all those who gave me the possibility to complete this Dissertation. I thank the entire Strathmore University Family for giving me humble time and also allowing me to use the facilities especially the Laboratory and Library to carry out my research. I would furthermore like to thank the Faculty of Information Technology, thanks for your moral support during my research.

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## Dedication

My gratitude glory to almighty God for the well strength and wisdom while doing my research. Thanks Prof. Ngumbi family for supporting me financially emotionally and spiritually to complete my final research document, Dad will forever remain in my heart for being there for me in my dissertation period , thanks daddy, May almighty God bless you.



## CHAPTER ONE: INTRODUCTION

### 1.1 Background

Many companies are starting to realise the benefits of vehicle tracking systems. The benefits cross all industries and both the commercial and public sector. Tracking makes it easier to eliminate fleet inefficiencies such as journey duplication/overlap and unscheduled journeys. It also encourages a safer, more economic driving style among mobile employees and more efficient call placing. Other benefits include reduced vehicle wear and tear and reduced administration time associated with meeting health and safety policies (Marchet, Perego & Perotti, 2009).

The potential benefits of a vehicle tracking system can be immediate, with enhanced fleet reactivity and productivity making it possible to generate a fast return on investment and increase business capacity. It can also assist with meeting the needs of government legislation and security for mobile employees (Ting, Wang & Ip, 2012).

Vehicle tracking is a way to improve company efficiency and in effect, increase profitability, especially in the business of large vehicle fleets (Hsieh, Yu, Chen & Hu, 2006). The tracking system is the enabling technology, and is the key to release the value trapped in asset management. By its non-contact, scan-based data reading characteristics, it automates the asset tracking and data acquisition that enables an enterprise to locate vehicles (cars, trucks, etc.) and even uses location information to optimize services. With the help of tracking information, the manager is able to access one or more driver locations and gets their status information on a real-time basis (for instance, checking if the drivers execute the order; if they follow the driving routes; if there is any traffic congestion (Roh, Kunnathur & Tarafdar, 2009).

Numerous studies suggest that Radio Frequency Identification (RFID) technology can provide improved container handling efficiency; however, there is a relative lack of research concerning adoption of tracking and monitoring systems of police vehicle movement in the security operations. This study therefore aims to formulate a model for the adoption of tracking and monitoring systems for police vehicles in the Kenyan police service.

The vehicle tracking systems that is applied to security and safety is rapidly being tested and piloted and it has remained a matter of several government reports and legislative responsibility

(Bharath, 2013; Ripplinger & Brand-Sargent, 2010; Rahul, 2014). The vehicle industry has been adopting the use of vehicle tracking for a several reasons, particularly the efficiency achieved by better fleet management of both drivers and assets such as trucks or tractors) (Elshafee, EIMenshawi & Saeed, 2013).

Keeping track of all vehicle movements has been made possible and easier by vehicle tracking and monitoring systems. The motor tracking systems makes use of techniques such as the Geographical Positioning Software (GPS) and radio navigation system which function through satellites and ground based stations (Bharath, 2013; Ripplinger & Brand-Sargent, 2010; Rahul, 2014). There is widespread use of the motor tracking system in commercial operations such as fleet management (Elshafee, EIMenshawi & Saeed, 2013). Non commercial activities such as monitoring employee driving behavior and vehicle theft prevention also make use of the tracking system. This is made possible by following the signal emitted by the motor tracking system to locate the vehicle.

Transmissions from orbiting satellites are picked up by GPS which is then used by on-vehicle technology to calculate location (Ripplinger & Brand-Sargent, 2010). Other vehicle tracking and monitoring technologies include the Automatic Vehicle Location (AVL) and the Radio Frequency Identification (RFID). The origins of use of RFID technology date back to World War II, when it was used to detect friendly aircraft (Hasan, Rahman, Haque & Rasheed, 2009).

Vehicle tracking holds the promise of reducing risks created by unsafe driving practices and by terrorist attacks. Insurance companies that are looking at available methods and technologies as well as commercial best practices no doubt will increasingly factor vehicle tracking into their appraisal of each company's overall posture, which will in turn influence insurance rates (Rahul, 2014). Vehicle tracking results in higher efficiency and productivity (Rahul, 2014). There are various reasons for low adoption of these vehicle tracking and monitoring softwares in Kenya including criticisms of invasion of privacy by GPS and that the cost of implementing RFID is high and this poses a hindrance to its implementation (Lai, Ngai & Cheng, 2005).

The Kenya police service is mandated with keeping law and order. Its originated dates from the incorporation of Kenya in the British colonial empire and the Mombasa to Uganda railway line construction. In the past decade, the service has come under scrutiny over rampant corruption, high crime rates and abuse of office by senior officers (Auerbach, 2003; Cheng, 2005; Rahul,

2014). In an effort to improve accountability in the force, this study discusses the adoption of vehicle tracking and monitoring software. To our knowledge, no study has been conducted on the adoption of vehicle tracking and monitoring software in the Kenyan police service.

### **1.1.1 The Kenya Police Service**

The Kenya police service is the official national law enforcement body in Kenya. The service owes its heritage to the British colonial police service established by Imperial British East Africa (IBEA) Company between 1887 – 1902 (Kenya Police, 2004). The force is headed by the inspector general of police under the Ministry of Interior and Co-ordination of National Government. Each police station is headed by an Officer Commanding Police Station (OCS).

The mandate of the Kenya Police Service includes the maintenance of law and order; ensure peace; life and property security of the citizens; early detection, prevention of criminal activities and intentions; arrest law breakers and enforcement of laws and regulations assigned to the service (Kenya Police Service, 2003). The Police Service's role of ensuring security is closely linked to the economic pillar of the Vision 2030 blue print. The police service is plagued by among other issues of understaffing, lack of autonomy and inadequate resources. Corruption, disregard for human rights and extortion also continue to undermine the legitimacy of the force (Kenya Police Service, 2003).

### **1.2 Problem Statement**

In the past decade, the Kenyan Police service has come under scrutiny over rampant corruption, high crime rates and abuse of office by senior officers (Auerbach, 2003; Cheng, 2005; Rahul, 2014). Recently, the Police service issued a warning on the Police vehicle stolen during Lamu terror attack. The Police Inspector General warned the public to be vigilant, cautioning that the police vehicle stolen with registration number GKB 595J could be used by criminals or terrorists to commit crime in any part of the country (Ombati, 2015). This is an indicator of the poor vehicle tracking and monitoring measures by the police service.

A spot-check on the Kenya police revealed that presence of patrol cars in the streets has not increased as was expected, in the wake of the leasing of hundreds of emergency response vehicles to the police in 2014. Juniors on routine easily drive away from areas they are supposed to patrol and move to other zones dotted with bars and night clubs, as well as matatu termini with

the aim of collecting bribes. Rogue officers also ensure the fuel consumed while the cars are used for personal errands is paid for by the taxpayer. The cars are fuelled at stations authorized by the service on the pretext the car is on official duty (Ombati, 2015).

Effective use of the existing resources is likely to better service delivery. It is therefore imperative to formulate a model for the adoption of tracking and monitoring systems in the Kenyan police service. This study sought to fill this gap by examining the model of adoption of tracking and monitoring software in the Kenyan police service

### **1.3 Aim of the Study**

The main purpose of the study was to formulate a model for the adoption of tracking and monitoring systems for police vehicles in the Kenyan police service.

### **1.4 Specific Objectives**

The following specific objectives were used to guide the study:

- i. To investigate the extent to which vehicle tracking and monitoring systems has been adopted in the Kenya police service.
- ii. To assess the factors influencing adoption of vehicle tracking and monitoring systems in the Kenya police service.
- iii. To formulate an adoption model for vehicle tracking and monitoring systems in the Kenya police service.
- iv. To validate the adoption model for vehicle tracking and monitoring systems in the Kenya police service

### **1.5 Research Questions**

- i. What is the extent of adoption of vehicle tracking and monitoring systems in the Kenya police service?
- ii. To what extent do various factors influence adoption of vehicle tracking and monitoring systems in the Kenya police service?
- iii. How should the model be used to increase adoption of vehicle tracking and monitoring systems in the Kenya police service be formulated?

- iv. How does the proposed model change after validation?

## **1.6 Significance of the Study**

This research may help understand the factors that influence the adoption of vehicle tracking and monitoring systems in the Kenya police service. The results of the research may guide the Kenya police service in the introduction of vehicle tracking and monitoring software to ensure such technologies are smoothly absorbed into the services' culture and processes. The results may help audit the police service and help develop strategies and policies to increase accountability.

This research may also be important to scholars as it may add to the existing body of knowledge. It may also complement previous research done on adoption of vehicle tracking and monitoring software. It may provide a platform for further research to be carried out on the adoption of vehicle tracking and monitoring software in the Kenya police service.

## **1.7 Scope of the Study**

The study was aimed at formulating the model of adoption of vehicle tracking and monitoring systems in Kenyan police service. This is because the adoption of vehicle tracking and monitoring systems in Kenyan police service may go a long way in ensuring transparency and efficiency in use of police vehicles. This study was conducted in the year 2015.

## **1.8 Study Limitations**

The nature of the study called for confidential information related to the Kenya police service. Respondents may feel intruded when requested to complete a questionnaire which required them to disclose such information. In order to mitigate this shortcoming, the respondents were assured of confidentiality and ethical handling of the information.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter explored the literature that focused on the adoption of vehicle tracking and monitoring systems in Kenyan police service. It also contains the proposed model and theoretical framework. The empirical review addressed the various studies that have been done on the area.

### **2.2 Adoption of Vehicle Tracking and Monitoring Systems**

There are several theories that explain the adoption of innovation and technology. The theories discussed are the diffusion of innovation theory and the technology acceptance model. This theory was developed by Everett Roger who argues that diffusion is the process by which an innovation is communicated through certain channels over time among the participants in a social system (Rogers, 1999). According to the theory, there are four main elements which influence the spread of a new idea: the innovation itself, communication channels, time, and a social system.

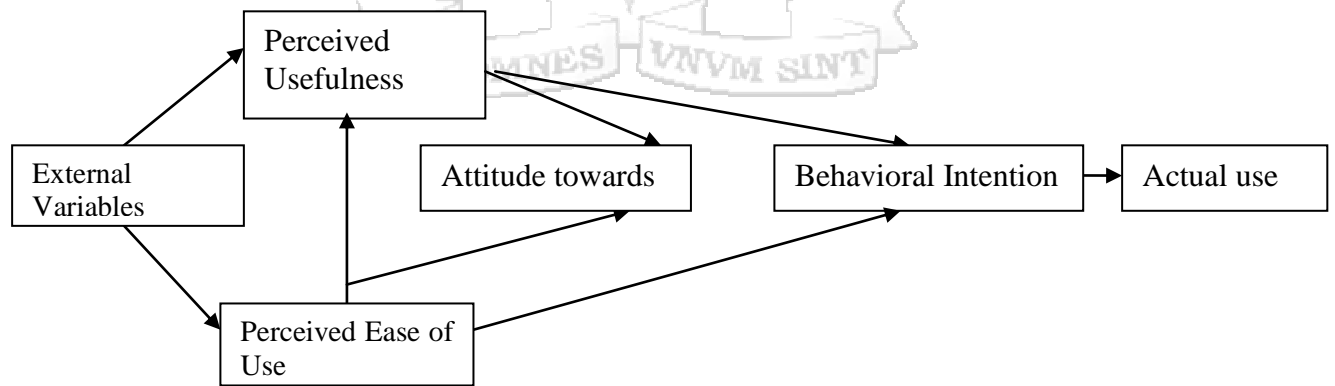
According to (Roger, 2004; Medlin, 2011; Parisot, 2013), innovation is an idea, practice or project that is perceived as new by an individual or other unit of adoption. He further states that communication can be defined as a process of creating and sharing information to reach a mutual understanding. The whole process from the point of innovation to the point of decision is motivated by information asymmetry whereby individuals seek information on sides of innovation, the good and bad before deciding to adopt the innovation.

The five steps identified from this process were knowledge, persuasion, decision, implementation and confirmation (Rogers, 2004). Casmar (2001), Rogers (2004), McKenzie, (2011) and Finley (2013) described the innovation-diffusion as an uncertainty reduction process. He has also proposed attributes that can help reduce uncertainty regarding the innovation which are relative advantage, compatibility, complexity, triability and observability. Relative advantage has to do with the idea giving an organization an edge while compatibility has to do with the degree to which the innovation is seen to be consistent with the values of the organization and the needs of the potential adopters. Triability is the degree to which an innovation may be experimented on with a limited basis. Observability relates to the degree to which the innovation is observable by others.

### 2.2.1 The Technology Acceptance Model

The Technology Acceptance Model (TAM) (see figure 2.1) was developed by Fred Davis in 1989. The model advances two aspects which influence the level of technology acceptance which are Perceived Usefulness and Perceived Ease of Use (PEOU). Perceived usefulness (PU) is the level to which the user perceives the technology in terms of efficiency while perceived ease of use (PEOU) is the user's relating technology to ease of work (Davis, 1989). The theory argues that the consumers' attitude towards using new technology is influenced by perceived usefulness and perceived ease of use. The theory uses psychometric scales to measure perceived ease of use and usefulness.

Perceived usefulness is measured on scales of whether work is done more quickly, job performance, increased productivity, effectiveness and usefulness. Perceived ease of use scales included whether the technology is easy to learn, clear and understandable, easy to become skillful easy to use, controllable and easy to remember. Apart from the two aspects identified above, the model also considers external factors as a factor that influences the intention to use and the actual use of technology (Davis, 1989). One of the criticisms for studies that adopt TAM model is that self reported use data are used to measure system use instead of real actual use data. Self reported use data is a subjective measure, and is thus unreliable in measuring actual use of a system (Auerbach, 2003; Cheng, 2005; Rahul, 2014).



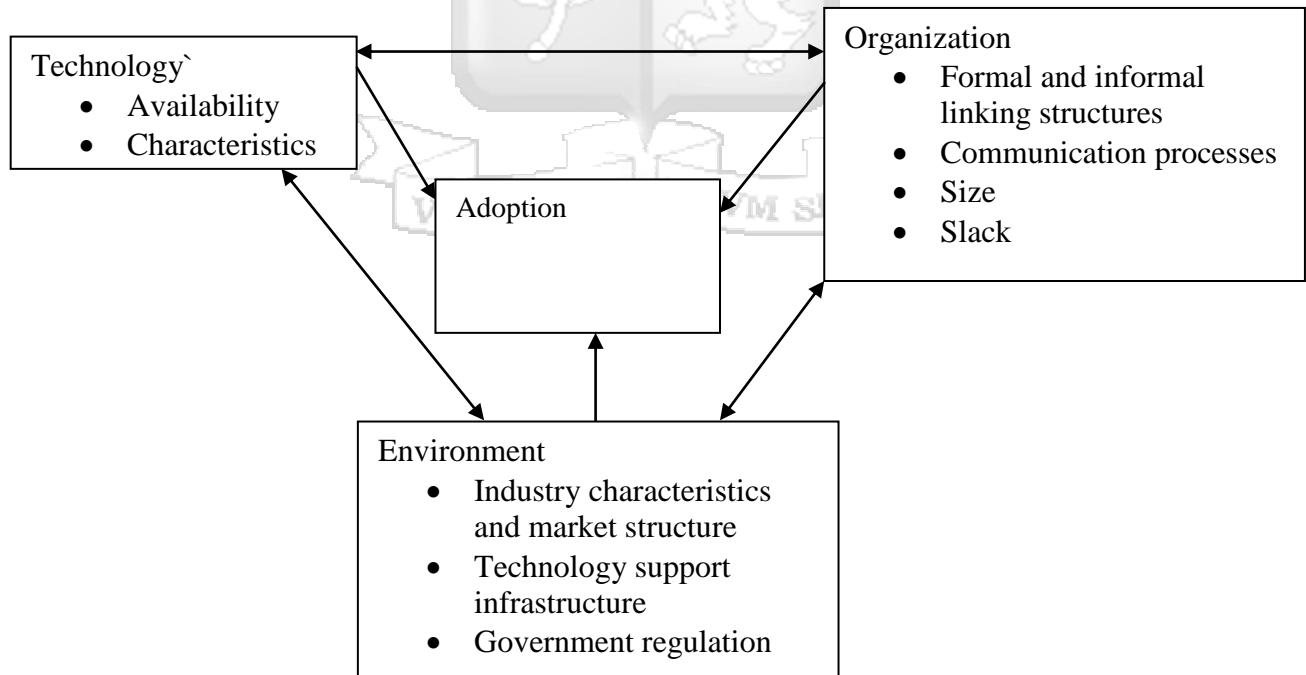
**Figure 2.1: The Technology Acceptance Model**

Adopted from Davis (1989)

## 2.2.2 The Technology Organisation and Environment Model

The (Technology Organization and Environment) TOE framework in figure 2.2 was developed by Tornatzky and Fleischer (1990). It identifies three aspects of an enterprise's context that influence the process by which it adopts and implements a technological innovation: technological context, organizational context, and environmental context.

Organizational context includes company's business scope, senior management support, culture, centralization of managerial structure, vertical differentiation and formalization, among other factors (Jeyaraj, Rottman & Lacity, 2006; Sabherwal, Jeyaraj, & Chowa, 2006). Environmental context is the arena in which a firm conducts its business its industry, competitors, and dealings with the government (Tornatzky & Fleischer, 1990). It has been used widely in IT adoption studies at the organizational level (Hart, 2012). In Lipert's (Lipert et al, 2006) study of TOE antecedents to web services adoption, he noted that many empirical studies (Chau & Tam, 1997; Gibbs & Kraemer, 2004; Thong, 1999; Zhu, 2004; Zhu, 2003; Zhu & Kraemer, 2005) have used the TOE model as a theoretical foundation for investigating organizational adoption of new technologies.



**Figure 2.2: T-O-E model**

Adopted from Oliveira and Martins (2010)

Moore's Technology Adoption Life cycle theory posits that there are different motivations for adoption of innovations. According to the Moore's Technology Adoption Life Cycle (Moore & Benbasat, 1991), the sum influence of population choices as outlined by the S curve develops distinct patterns of technology enabled markets (Mazhelis, Luoma & Ojala, 2012).

Discovering the phase or stage a product is not a simple task. Sometimes adoption is not a linear process and therefore one cannot clearly say which stage of adoption a product is. The relevance of this theory to the adoption of vehicle tracking systems is that it is not easy to tell the level of adoption of the vehicle tracking systems. In addition you are not able to tell whether the police service is early adopters or late adopters of technology.

Recently, the lower costs and the increasing capabilities of the vehicle tracking systems attract attention in keeping track and monitoring the containers in the terminal (Hsu, Shih & Wang, 2009; Park, Dragovic & Kim, 2009; Ngai et al., 2010). Woo, Choi, Kwak and Kim (2009) proposed an activity product state tracking system architecture which is able to track products even when they are in a box or a container.

### **2.2.3 Radio Frequency Identification Model**

Abad et al. (2009) developed an RFID-based system for traceability and cold chain monitoring of food. Wang et al. (2009) proposed a RFID-based decision support system to monitor, trace and track products in containers. Chao and Lin (2009) analyzed critical factors affecting the adoption of a container security service, which is composed of auto-detection and RFID technologies, from the shippers' perspective.

Cao and Xiao (2011) analyzed a propagation prediction model and the performance of a container vehicle tracking systems under metallic container production circumstances. These applications encourage study of RFID to realize vehicle tracking in container terminals. However, although numerous studies involving the installation of RFID have demonstrated the benefits of better container handling efficiency, a relative lack of research concerning tracking and monitoring vehicle movement in the container terminal environment is appearance.

There is another technique based on cellular infrastructure. Network Overlay Systems use cell phone infrastructure for locating vehicles (Kane, Vermaa & Jaina, 2008). The cell centers with additional hardware and software assess the time of arrival (TOA) and angle of arrival (AOA) of

radio signals from vehicles to compute the position of the vehicles. This information is sent to the tracking center through the cell link or a conventional link. Another technique used for locating vehicles computes the time difference for signals from two cell centers to reach the vehicle. This computation is made in a public platform and the position information is sent to the tracking center through the cell phone link. Unfortunately this approach cannot get the vehicle locations fairly accurately.

Ayers, Wu, and Anderson (2004) evaluated the use of the GPS35-HVS GPS for vehicle tracking and found that GPS was able to monitor a vehicle position and dynamic properties. However there are still some limitations with GPS. On average, a satellite navigation receiver is accurate to within 15 m. A number of positioning errors can occur, limiting accuracy to within 15–25 m. The positioning errors are supposed to intensify when a fast moving vehicle is to be tracked and immediate longitude and latitude calculations are to be carried out (Kane et al., 2008). Additionally, GPS focuses on location tracking not objective tracking.

The use barcodes is also a common technology for vehicle tracking. For easy identifying and tracing of products and containers, barcode technology had been used in products and containers management for several years. Nowadays, RFID is beginning to replace barcode techniques because of the limitations of the old technology, especially in logistics. Compared with barcodes, RFID enables the capturing of real-time information in fast moving and bulky product flows with the aim of achieving a high degree of efficiency and assuring high quality (Marchet, Perego and Perotti, 2009).

### **2.3 Usage of Vehicle Trackig Systems**

The potential business benefits of vehicle tracking span every sector and vehicle-type. For haulage fleets, the main advantages include improved asset management, enhanced customer service and more efficient load placing, more accurate timesheets and assisted compliance to Working Time Directive legislation. For van fleets, vehicle tracking can also improve efficiency in job planning and allocation, resulting in greater employee productivity (Mullani, (2005).

In some cases this can also help companies to meet service level agreements and key performance indicators. The technology can make it easier to analyse driving time against chargeable time and engineers are able to work uninterrupted by service centre calls. Using

vehicle tracking can enhance the safety of those employees working alone and it can also serve as protection from claims of late or non-appearance on site (Marsal, 2006).

With the rapidly increase in number of vehicles in Kenya, there is an increase need of tracking your vehicle or fleet of vehicles due to the following reasons: Increase in carjacking incidences that are unresolved by the police, increase in unrecovered stolen motor vehicles, to know exactly where all your vehicles are and of what use they are being used for. It will tell you what time your driver started, how long is being spent on breaks or whether the vehicle is being used to pursue non-work related activities and finally it can be used to settle false claim or complaints against the company that may arise hence prove indubitably where the vehicle was at the time of the alleged and thus demonstrate that the claim is bogus (Otieno, 2014). Vehicle location based services and tracking system available in Nairobi city in Kenya mainly focus on private car owners, fleet management for various organization and cargo tracking for instance G4S fleet management and Auto Track Company.

#### **2.4 Factor Influencing Adoption of Vehicle Tracking and Monitoring Systems**

This section reviewed literature from prior scholars regarding the adoption of vehicle tracking and monitoring. Ripplinger and Brand-Sargent (2010) analyzed the adoption of transit technology used by small firms. The study used categorical response models such as logit models. The study results indicated that the size of the transit agencies was one of the major contributors to the adoption of Computer-Aided Scheduling and Dispatch Software. The study recommended that transit agencies ought to employ economies of scale as this led to an increase in the adoption rate of transit technology. The study differs significantly from the current study since the current study focuses on adoption of vehicle tracking software in the police service in Kenya. This is a gap that the current study wishes to address.

Nzomoi *et al.* (2007) sought to establish the factors influencing technology adoption in the horticultural sector in Kenya. The study concluded that the level of education, low and inconsistent participation of the government, poor credit access and enrollment into membership association influenced technology adoption. It was recommended that more education and training to be given to farmers, increased government participation, increasing ease of accessing credit for the farmers. The study is different from the current study in that it focused on horticulture farming while current study will be on the police service in Kenya.

Ting and Wang (2012) investigated the extent of adoption Radio Frequency Identification technology in container terminal in China. Results revealed that the adoption of RFID was poor in many areas. The study differs from the current study since it was done in China while the current study was done in Kenya, a country that is less developed than China. The study also differs because it did not focus on vehicle tracking adoption in the police service.

Nyamawe (2014) also studied the adoption of ICT in tracking over speeding vehicles in Tanzania. The study also proposed the model for tracking in real time vehicle over-speeding in Tanzania. According to the study, to reduce road accidents and for better performance, the existing measures needed to be supplemented by more sophisticated ways. The proposed model for tracking vehicle over-speeding was expected to deliver the ability to track buses in real time. The system would constantly update the law enforcers (traffic police) on what is going on in the roads and take prompt action in case of misbehaving. The successful implementation of the model was anticipated to offer positive results and contributes to road safety.

Wang and Potter (2007) assessed the introduction of tracking system in the shipping industry in the UK. Findings revealed that tracking system was still not well adopted but with possibility of higher levels of adoption in days to come. There exists a contextual gap as the study focused on the shipping industry and not the police service. The geographical scope also differs from the current study as it was not carried out in Kenya but in the UK.

Bett (2012) examined the adoption and impact of GPS technology on motor vehicle insurance in Kenya's insurance industry. The study revealed that the adoption of GPS tracking systems by insurance firms was low. This is because it focused on Lorries and trucks only. The study failed to address the factors that influence adoption of vehicle tracking systems by the police service in Kenya. This is a research gap that the current study wishes to address by focusing on factors of adoption such as ease of use, perceived usefulness, and availability of resources and awareness of vehicle tracking systems.

Karake (2014) investigated the factors affecting the adoption of electronic policing in the police service. The study found that the police service had adopted electronic identification, police-public interface, centralized information storehouse, radio frequency identification (RFID) and electronic transport (E-Transport) systems. Further, the service had adopted online verification and fingerprints reader, real-time Information access, closed circuit television (CCTV) and

intelligent sensors systems in crime control in Nairobi County. The study concluded that the adoption of epolicing had significantly increased efficiency in crime control. The study mentioned that difficulties of integrating existing systems with electronic policing systems and perceived loss of control are some of the challenges in the adoption of epolicing.

## **2.5 Police Operations In Kenya**

The work on police reforms in Kenya has a fairly long history without adequate change in the structure and attitude of the police service to match. Among the more difficult aspects of reform is transformation of attitudes within the Police Service to ingrain the values of democratic policing, and in particular, accountability to civilians in the exercise of police power. The commentaries on policing in Kenya have noted that the Service has a history of poor relations with civilians and does not enjoy high levels of confidence from the public. Credible policing in a developing democracy calls for accountable policing, where the exercise of police power is restrained, deliberate and cognisant of citizen rights (IPOA, 2014).

Nyongesa (2013) carried out a study with a focus on the Kenya Police and the setbacks the police service experience during strategy implementation. Using a case study approach, it was shown that some of the challenges to effective strategy evaluation were terror threats, use of outdated security facilities, and lack of financial resources, political instability and bureaucratic procedures. Although the study covered the police force as the current study, it did not address the issue of adoption of vehicle tracking and monitoring software in the service thus presenting an objective gap that the current study aims to address.

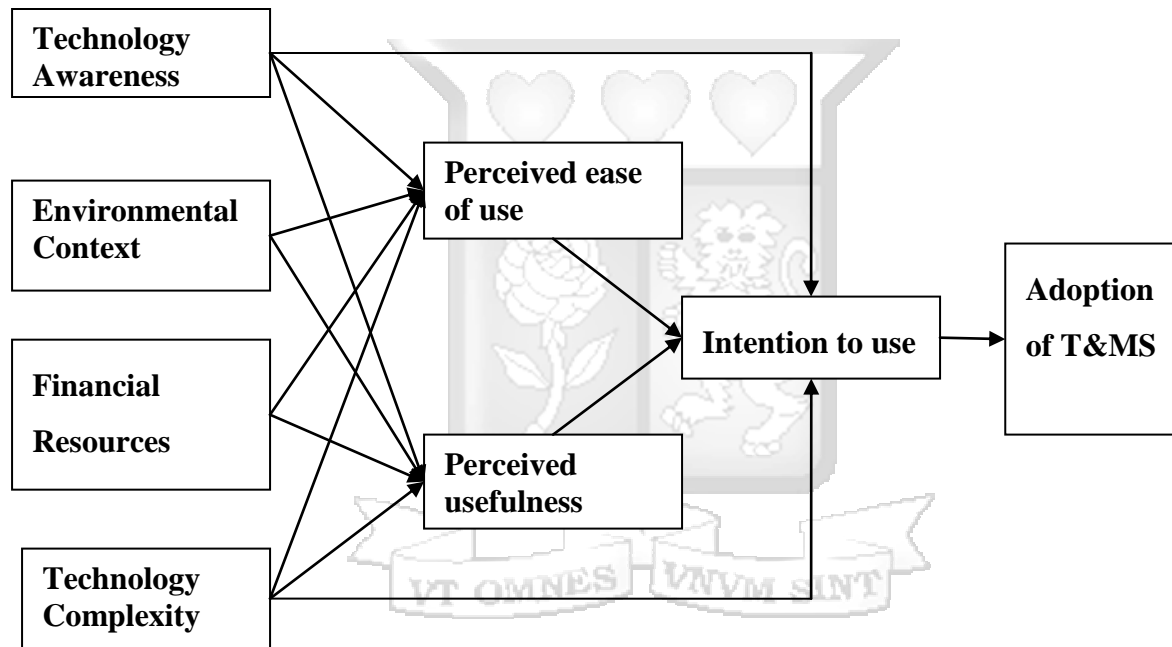
Geubuza (2012) investigated the management policies on car theft in Maputo. Using a mixed method approach, the results indicated that there was lack of any management policy to curb car theft in the crime prevention stations in Maputo. The study differs from the current study as it was carried out in Maputo and not in Kenya. The study also focused on the crime prevention service and not the police service.

Ngugi, Were and Titany (2012) explored the determinants of service delivery in the Kenya Police Service. ICT adoption was found to be a significant determinant of service delivery. Despite the population of this study being the same as that of the current study, it ignored the issue of adoption of vehicle tracking and monitoring systems in the Kenya police service.

Investment cost is one of the significant factors affecting the implementation of RFID systems (Ngai, et al., 2010). In Ngai, et al., (2010) study, the total setup cost (including the readers, tags, software, etc.) was around HK\$ 6.5 millions to track and trace 600 vehicles (with 100% tag readability).

## 2.6 Proposed Model and Research Hypotheses

This study adopted a multidimensional approach to develop a model for the adoption of tracking and monitoring systems for use in police vehicles by the Kenyan police service. The research proposed model is presented in Figure 2.3 below.



**Figure 2.3: Proposed Model**

### 2.6.1 Technology Awareness

Technology awareness refers to the awareness by the environment about the human and environmental processes and their interaction. Studies have shown that the level of awareness significantly affect the adoption of technology.

### **2.6.2 Environmental Context**

Environmental context factors include other people's behaviors and attitudes and social pressures imposed to the individuals. Environmental context factors involve that how people who are vital for end users have an influence on them towards adopting a system. Previous studies indicate that subjective norm has a direct relation with both Perceived Usefulness and perceived ease of use in the scope of adopting e-learning systems (Wang & Wang, 2009).

### **2.6.3 Financial Resources**

This is the financial ability of Kenya police service to invest in tracking and monitoring systems. Hall and Khan (2003) in their study on adoption of new technology suggested that the obvious determinants of new technology adoption are the benefits received by the user and the costs of adoption. The investments required may be a hindrance or an enabler, the higher the resource allocation to the adoption, the higher the expected adoption of vehicle tracking and monitoring systems.

### **2.6.4 Technology Complexity**

Complexity is included understand the effects of technological traits on users' perception of ease of use. Technological Complexity (TC) is categorized under technological context factors and will be included in the research model to assess how perception about the complexity of a system affects the instructors' intention to use. Technological Complexity can be defined as the level to which technology is perceived as difficult to understand and use (Thompson, Higgins, and Howell, 1991). In a previous study, Teo, (2009) study stated that if a technology perceived as being complex, it is perceived as being time consuming and tedious which results in a lot of effort to be spent to benefit from it.

### **2.6.5 Perceived Ease of Use**

Perceived Ease-of-Use (PEOU) are categorized into indicative factors to assess how system's utility and easiness influence users' perception and intention to use. Perceived Ease-of-Use is the major factor that influences the behavioral intention to use technology. Previous studies revealed that PU and PEOU directly influence the intention to use (Chang and Tung, 2008).

### 2.6.6 Perceived Usefulness

Perceived Usefulness is defined as the level to which an instructor trusts that using such systems will improve his or her performance. Chang and Tung (2008) argue that perceived usefulness affects the intention to use of new technology.



## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

The chapter presents the research design and the relevant approaches to research design. It also lays out the study population and highlights the unit of analysis and unit of observation. The sample and the way to arrive at the sample size are laid out. Data collection instrument and data collection procedures are also presented. The pilot study and its relevance to the study objectives were discussed. The method of data analysis and its justification was also provided.

### **3.2 Research Design**

This study used explanatory research design. A typical research question that can be answered by an explanatory research design is what is the influence of perceived usefulness on the intention to use of a particular innovation? Another question that can be answered using explanatory research design is how does factor x and y influence z. The explanatory research design was used to answer the main research question (Mugenda & Mugenda, 2003; Kothari, 2004). The use of explanatory research design was justified on grounds that it is the most appropriate to answer the research objectives since it will enable this study to address the research questions.

### **3.3 Study Population**

A population is a collection of a complete set of study units (Mugenda & Mugenda, 2003). A population can be a set of people, set of countries, set of products, set of companies or any other finite set of items (Borg & Gall, 2007). The population of this study consisted of all police stations and police posts in Nairobi County either having or not having a vehicle monitoring and tracking system. The number of police stations and police posts in Nairobi County is 110. The list of police posts and police stations are given at the website of the Kenya Police Service <http://www.nationalpolice.go.ke/>. The list of police stations is given in Appendix.

### **3.4 Sample Size and Sampling Design**

A sample is a subset of a population. It is important to consider whether sampling is necessary in a study. Several factors influence the decision of whether to sample or not. These include convenience, representativeness, cost and the nature of data to be collected (Borg & Gall, 2007).

Fostgate (2012) recommends that a formula should be used for calculating the sample size from a population. The choice of the formula depends on the margin of error and the proportion chosen. Other studies that have used this formula include; Fostgate (2012), Georgiadis, Johnson and Gardner (2005) and Dohoo, Martin and Stryhn (2003). Since the population of police in Nairobi is large the study adopted the formula below to come up with the sample size to be used in this study.

$$n = Z^2 * p * (1-p) / d^2$$

Where:

n = Sample size for large population

Z = Normal distribution Z value score, (1.96)

p = Proportion of units in the sample size possessing the variables under study, where for this study it is set at 50% (0.5)

d = Precision level desired or the significance level which is 0.13 for the study

The substituted values in determining the sample size for a large population are as follows.

$$n = \frac{(1.96)^2(0.5)(0.5)}{(0.13)^2} = 57$$

Hence, the respondents were selected from 57 police posts and police stations.

**Table 3.1: Sampling Distribution**

Type	Population	Sample Size	Percentage
Police posts	100	50	88%
Police Stations	10	7	12%
<b>Total</b>	<b>110</b>	<b>57</b>	<b>100</b>

### 3.5 Data Collection Instruments

A wide range of data collection instruments can be adopted in research including but not limited to interviews, questionnaires, observation guides and focus group discussions. This study utilized primary data in order to answer the stated research questions and as such, the study adopted a questionnaire to collect primary data. One questionnaire was distributed to each of the selected

police stations selected for the sample. A questionnaire is a structured data collection instrument that presents a set a question based on the research objectives. A questionnaire can take a form of a likert scale where a respondent is expected to rate the responses according to a scale such as “disagree”, “strongly disagree”, “neutral/moderately agree” “agree” and “strongly agree” (Schwab, 2005). The questionnaire (Appendix A) is structured as follows: Section I: Background Information; Section II: Adoption of Vehicle Tracking Software; Section III: Factors Affecting Adoption of Vehicle Tracking Software. The choice of a questionnaire as a data collection tool is because it was convenient in data collection and was not to take up much of the respondents’ time. The questionnaire also makes data analysis easier as it is possible to convert the responses to quantitative form by assigning numerical codes to each response (Upagade & Shende, 2012).

### **3.6 Pilot Test**

Baker (2014) found that a sample size of 10–20% of the sample size for the actual study is a reasonable number of participants to consider enrolling in a pilot. To this effect therefore, the accuracy and appropriateness of the questionnaire items were tested through a pilot study of 10 police posts in Nairobi. A pilot study is carried out to determine the reliability and accuracy of the data collection instrument. In pilot testing two elements are considered, reliability and validity (Sekaran, 2003).

### **3.7 Reliability of the Data Collection Instrument**

Reliability refers to the consistency of the data collection instrument. A reliable questionnaire would imply that the respondents understand the items in the questionnaire. It also implies that the constructs that have been generated to measure a variable are related (Sekaran, 2003).

To measure reliability of an instrument, it is recommended that about 5-10% of the sample is used for pilot testing. Once the data collection instrument is administered to the selected respondents, the data is entered into SPSS. In order to determine that a data set is reliable, the Cronbach’s alpha statistic is extracted. Cronbach’s alpha statistic run from 0-1 with a coefficient of 0.7 indicates reliability of the instrument. For the purposes of this study, a Cronbach’s alpha of 0.6 or more will be accepted (Cooper & Schindler, 2006).

### **3.8 Validity of Data Collection Instrument**

Validity of the data collection instrument relates to the relevance of the contents of the data collection instrument. It assesses whether the data collection instrument is measuring what it intends to measure (Bryman & Cramer, 1997). Validity was checked by subjecting the questionnaire to experts. Another approach is to subject the data collection instrument to the supervisor (Turnock & Gibson, 2001).

### **3.9 Data Analysis and Presentation**

#### **3.9.1 Preliminary Data Analysis**

After the data collection exercise, data entry was done through Statistical Package for Social Sciences (SPSS (V.21)). The data was quantitative in nature and therefore required quantitative methods of analysis. Quantitative methods of analysis require either the use of descriptive statistics analysis or inferential statistics analysis. Descriptive statistical analysis included the analysis of means, frequencies and percentages and standard deviations. On the other hand, inferential statistics involves the use of correlation and regression analysis. Regression analysis involves the estimation of effect of one variable on another. In this study, regression analysis was used to estimate the effect of awareness, perceived usefulness, ease of use and resources on the adoption of vehicle tracking software. The output of the model includes the r squared, F statistic, t statistic, standard errors and p values. The significance of the variables was tested against a critical p value of 0.05

#### **3.9.2 Identifying the Factor Structure**

Explanatory Factor Analysis (EFA) was performed to reveal whether the related items are clustered under the same factors or not. Maximum likelihood extraction method and direct oblimin rotation were conducted on questionnaire items because factors in the proposed research model are related with each other. The Bartlett's test of sphericity was also conducted to measure the sampling adequacy for the explanatory factor analysis (Field, 2009).

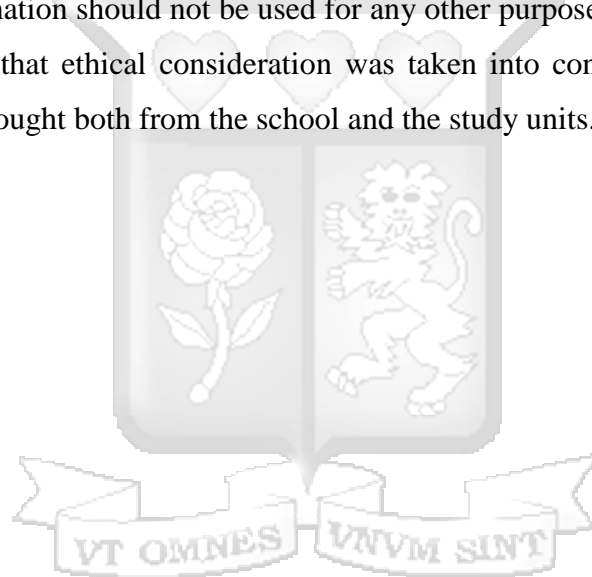
#### **3.9.3 Assessment and Validation of the Proposed Research Model**

The model validation was conducted using structural equation model analysis using the Confirmatory Factor Analysis (CFA) technique. In this study SPSS-Amos was used to analyze data. Confirmatory Factor Analysis (CFA) was carried out ascertain the correlation between

different items before the structural model is conducted. Amos was used to assess the statistical significance of each hypothesis considering the path coefficient values that are standardized betas. The data set was composed of 114 samples that were analyzed evaluate the significance level of the relations between constructs. The path coefficients estimated in the structural models were shown.

### **3.10 Ethical Considerations**

Ethical considerations require that the research should bring no harm to the study stakeholders. For instance, the respondents should not be forced to participate in the study but they should only do so in their own free will. The confidentiality of the study information should also be taken care of. The study information should not be used for any other purpose other than the one stated in the study. To ensure that ethical consideration was taken into consideration, permission to carry out the study was sought both from the school and the study units.



## CHAPTER FOUR: PRELIMINARY RESULTS

### 4.1 Introduction

This section provides the preliminary results which include socio-demographic characteristics of the respondents and descriptive results for variables under study. Percentages and frequencies were used to analyze the demographic characteristics of the respondents. The study used tables and charts to present the findings.

### 4.2 Response Rate

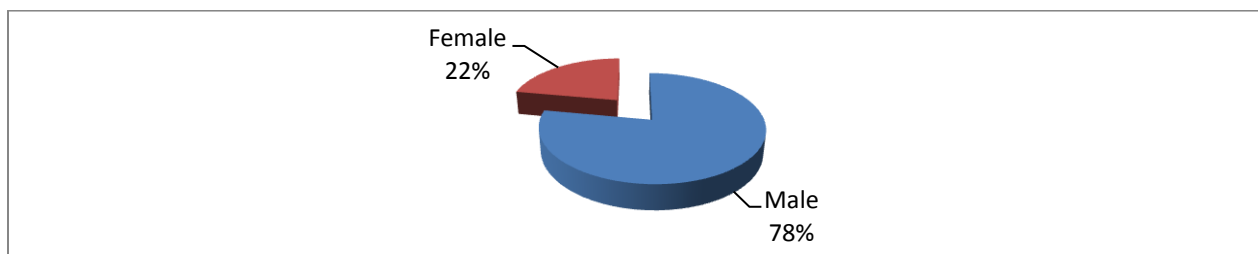
The total number of questionnaires distributed for this study was 114. The study sampled 2 policemen/women for each 57 police stations sampled. Out of the total of 114, 105 were properly filled and returned which represents a response rate of 92.1%. According to Mugenda and Mugenda (2003) a response rate of above 50% is adequate for a descriptive study.

### 4.3 Demographic Characteristics

The study sought to find out the demographic characteristics of the respondents. These include gender of the police, the rank of the police and the number of years the respondents had worked with the Kenya police service.

#### 4.3.1 Gender of the Respondents

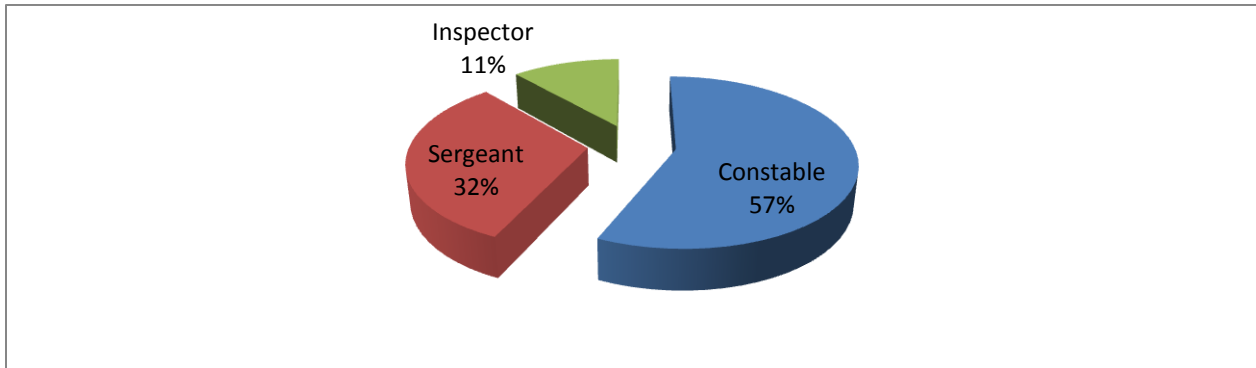
The findings indicate that majority of the respondents who participated in this study were male. This was represented by 78% of the respondents. The female respondents were 22% of the total respondents. The gender of respondents may have influenced the level of adoption of vehicle tracking and monitoring softwares.



**Figure 4.1** Gender of the Respondents

### 4.3.2 Rank of the Respondents

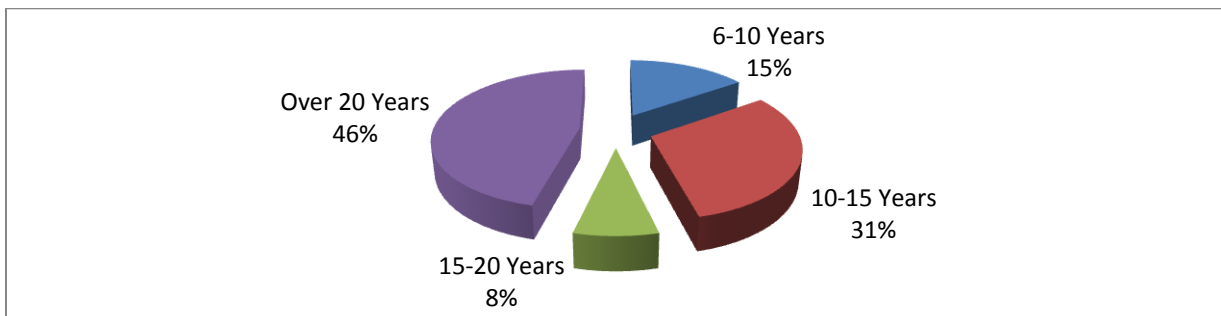
The study also sought to find out the rank of the respondents. The results indicate that majority (57%) were at constable level. Those at sergeant and inspector level were 32% and 11% respectively. The rank of respondents may have influenced the level of adoption of vehicle tracking and monitoring softwares.



**Figure 4.2 Rank of the Respondents**

### 4.3.3 Work Experience of the Respondents

The study sought to find out the number of years the respondents had worked with the Kenya police service. The findings indicate that majority (46%) of the respondents had worked with the Kenya police service for over 20 years. Those that had worked for between 10-15 years were 31% while 15% indicated to have worked for between 6-10 years. Those who had between 15-20 years work experience were the least at 8%. The work experience of respondents may have influenced the level of adoption of vehicle tracking and monitoring softwares.



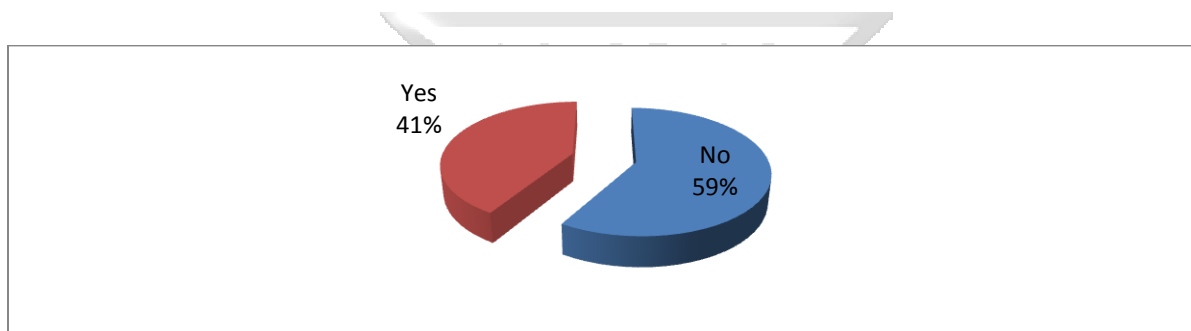
**Figure 4.3 Work Experience of the Respondents**

#### 4.4 Adoption of Vehicle Tracking Systems

The study sought to find out the level of adoption of the vehicle tracking and monitoring systems.

##### 4.4.1 Presence of IT department in Police Stations

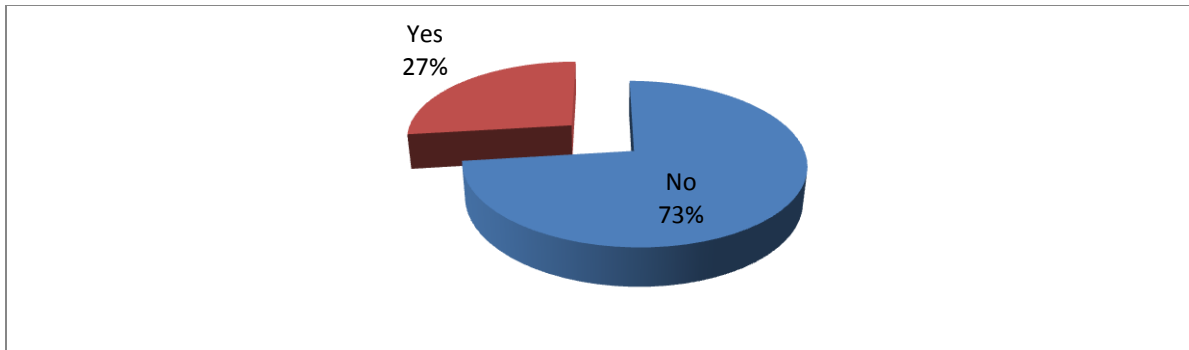
The study sought to find out whether the police station where the respondents worked had an IT department. The result shows that 59% of respondents work at police stations that do not have an IT department with 41% affirming to have IT department. The implication of this finding is that the Kenya police service has not adopted the use of technology in their service.



**Figure 4.4 Presence of IT Department in Police Stations**

##### 4.4.2 Presence of Vehicle tracking systems in Police Stations

The study also to find the percentage of police station that used vehicle tracking and monitoring systems. The findings show that 73% of the respondents indicated that their working station had no vehicle tracking and monitoring systems. This finding implies that most of the police stations in Kenya had not adopted the use of tracking and monitoring softwares.



**Figure 4.5 Presence of Vehicle Tracking Software in Police Stations**

#### 4.4.3 Descriptive Result for Adoption of Vehicle tracking systems in Police Stations

The table below contains result on how respondents responded to various statements measuring the level of adoption of vehicle tracking and monitoring systems. Majority of the respondents disagree (51.9%) and strongly disagree (41.3%) that they use vehicle tracking systems in their stations. Similarly, majority of the respondents disagreed on whether there was budget allocation for vehicle tracking and maintenance in their working station. The respondents also indicated that they were not trained on the use of vehicle tracking systems. These findings indicate the extent to which Kenya police service used vehicle tracking and monitoring systems was very low.

**Table 4.1 Descriptive Result for Adoption of Vehicle Tracking Software (Adapted from Research Data, 2016)**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std Dev
Vehicle tracking software is applied by our organization to ensure efficiency	41.3%	51.9%	2.9%	2.9%	1.0%	4	1
There's annual budget allocation toward the maintenance and acquisition of vehicle tracking software	62.5%	35.6%	1.9%	0.0%	0.0%	5	1
Our organization undertakes training on the use of vehicle tracking software	49.0%	45.2%	5.8%	0.0%	0.0%	4	1

#### 4.5 Intention to Use Vehicle Tracking Systems

Intention to use a certain innovation is important to adoption of the innovation. Before the population finally accept to adopt a technology they must exhibit the intent to use it. Here the study sought to establish whether the police had the intention of adopting the tracking systems. From the response given in table 4.2 below we can conclude that the respondents were willing to adopt the vehicle tracking systems. Majority (61.5%) of the respondents strongly agreed that given access they could adopt the use of tracking systems. Majority also indicated that they could adopt if the system was useful in their job, easy to use and increased their job performance. This clearly indicated that the respondents had intention to use the tracking system given access.

**Table 4.2 Descriptive Result for Intention to Use Vehicle Tracking Systems (Adapted from Research Data, 2016)**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std Dev
Suppose you access to vehicle tracking and monitoring system will you adopt and use	0.0%	0.0%	2.9%	35.6%	61.5%	5	1
I can adopt the vehicle tracking and monitoring system if it is useful in your job	0.0%	2.9%	4.8%	44.2%	48.1%	4	1
I can adopt the vehicle tracking and monitoring system if it is easy to use in my job	0.0%	1.9%	12.5%	41.3%	44.2%	4	1
I can adopt the vehicle tracking and monitoring system if it will increase performance of Kenya police	0.0%	0.0%	1.0%	53.8%	45.2%	4	1

#### 4.6 Descriptive Results for Technology Awareness of Vehicle Tracking Systems

The study also tested the extent of technology awareness among the respondents. The findings show that the technology awareness among the respondents was very high. The respondents strongly agreed to be aware of the existence of vehicle tracking and monitoring systems. They

also agreed have idea on how these systems worked and could be able to explain to their colleagues the how the systems worked.

**Table 4.3 Descriptive Result for Technology Awareness (Adapted from Research Data, 2016)**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std Dev
I am aware of the existence of vehicle tracking and monitoring systems	0.0%	0.0%	0.0%	44.2%	55.8%	5	0
I know and understand how vehicle tracking software work	0.0%	0.0%	0.0%	42.3%	57.7%	5	0
I am able to explain to my colleagues the functioning of vehicle tracking and monitoring software	0.0%	0.0%	2.9%	38.5%	58.7%	5	1
I can identify which vehicles have the vehicle tracking software installed	0.0%	0.0%	5.8%	54.8%	39.4%	4	1

#### 4.7 Descriptive Results for Environment Factors of Vehicle Tracking Systems

The study sought find out whether environmental factor contributed to adoption of vehicle tracking and monitoring systems. The results indicate that majority of the respondents felt that other people opinion and behaviours towards the technology, social pressure and external pressure were among environmental factor that influenced the adoption of vehicle tracking and monitoring systems. The respondents also indicated that having supportive infrastructure could influence the adoption of technological innovations.

**Table 4.4 Descriptive Result for Environmental Factors (Adapted from Research Data, 2016)**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std Dev
Others people's attitudes can influence Kenya police intention to adopt vehicle tracking software	0.0%	8.7%	12.5%	63.5%	15.4%	4	1
Others people's behaviour can influence Kenya police intention to adopt vehicle tracking software	0.0%	4.8%	15.4%	59.6%	20.2%	4	1
Social pressure can influence Kenya police intention to adopt vehicle tracking software	0.0%	8.7%	11.5%	52.9%	26.9%	4	1
There are supportive technical infrastructure for the adoption for vehicle tracking software	0.0%	0.0%	0.0%	41.3%	58.7%	5	0
There is external pressure for the police force to adopt vehicle tracking software	0.0%	0.0%	1.9%	51.9%	46.2%	4	1

#### 4.8 Descriptive Results for Financial Resources

The study sought to find out whether financial resources influenced the adoption of vehicle tracking and monitoring systems. The results indicate that the respondents strongly agreed and agreed that Kenya police service had financial constraints that limited their adoption of vehicle tracking systems. The results also shows that Kenya police service fails to invest in vehicle tracking systems because of the fear of relocating funds budgeted for other projects which could result to budget crisis. These finding indicates that given sufficient budget the Kenya police service could invest in vehicle tracking and monitoring systems.

**Table 4.5 Descriptive Result for Financial Resources (Adapted from Research Data, 2016)**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std Dev
There is inadequate budgetary allocation for Kenya police service	0.0%	1.0%	11.5%	44.2%	43.3%	4	1
Kenya police budget cannot finance for the adoption of vehicle tracking and monitoring in the service	0.0%	0.0%	3.8%	51.9%	44.2%	4	1
The adoption of vehicle tracking and monitoring software will compete with other projects for funding	0.0%	2.9%	4.8%	44.2%	48.1%	4	1
The adoption of vehicle tracking and monitoring software will strain the forces resources	0.0%	1.9%	12.5%	41.3%	44.2%	4	1

#### **4.9 Descriptive Results for Technological Complexity**

The study sought to find out whether the complexity of technology could influence the intention to use, perceived usefulness and perceived ease of use of the technology. The finding indicates that most of the respondents strong agreed and agreed on statement on technological complexity.

The finding shows that majority of the respondents perceived vehicle tracking and monitoring systems to be complex which the felt could have contributed to poor adoption. They also noted that some of these systems are likely to make the work of the police harder and more strenuous. One of the reasons behind the perception could be because most of the police in Kenya police service have no computer training and necessary skills to work with such systems.

**Table 4.6 Descriptive Result for Technological Complexity (Adapted from Research Data, 2016)**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std Dev
Vehicle Tracking and monitoring system is complex for Kenya police service	0.0%	7.7%	5.8%	55.8%	30.8%	4	1
Complexity of vehicle tracking and monitoring system affects its adoption	2.9%	6.7%	20.2%	43.3%	26.9%	4	1
Use of the tracking and monitoring system will make work difficult for police	0.0%	0.0%	1.0%	54.8%	44.2%	4	1
The adoption of vehicle tracking and monitoring software will strain the police	0.0%	2.9%	3.8%	60.6%	32.7%	4	1

#### **4.10 Descriptive Results for Perceived Usefulness of Vehicle Tracking Systems**

The study sought to test perceived usefulness of vehicle tracking systems among the Kenya police. The findings indicate that majority of the respondents perceived that these systems were useful to the Kenya police service. They strongly agreed (60.6%) that the system would; increase performance of police; improve accountability and reduce administrative costs of the police stations in Kenya. The results are shown in Table 4.7 below.

**Table 4.7 Descriptive Result for Perceived Usefulness (Adapted from Research Data, 2016)**

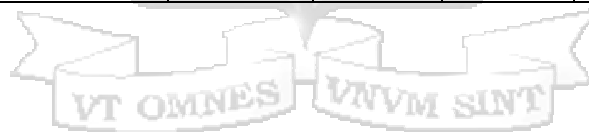
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std Dev
Adoption of vehicle tracking and monitoring software increases overall job productivity	1.0%	1.0%	0.0%	37.5%	60.6%	5	1
Adoption of vehicle tracking and monitoring software will improve accountability	0.0%	0.0%	1.0%	47.1%	51.9%	5	1
Adoption of vehicle tracking and monitoring software will be effective than the current manual system	0.0%	2.9%	3.8%	53.8%	39.4%	4	1
Adoption of vehicle tracking and monitoring software will increase administrative savings	0.0%	0.0%	3.8%	50.0%	46.2%	4	1

#### **4.11 Descriptive Results for Perceived Ease of Use of Vehicle Tracking Systems**

The study sought to test perceived ease of use of vehicle tracking system among the Kenya police. The findings indicate that majority of the respondents perceived that these systems were easy to use by the Kenya police service. Majority of the respondents agreed that if trained they could become skilful and could use less effort in working with the tracking and monitoring systems.

**Table 4.8 Descriptive Result for Perceived Ease of Use (Adapted from Research Data, 2016)**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std Dev
It easy to become skillful in vehicle tracking and monitoring systems	0.0%	0.0%	2.9%	37.5%	59.6%	5	1
It does not require much effort to adopt and use vehicle tracking and monitoring systems	0.0%	2.9%	14.4%	53.8%	28.8%	4	1
Vehicle tracking and monitoring systems is straight forward and easy to understand	0.0%	0.0%	17.3%	52.9%	29.8%	4	1
Adoption and use of vehicle tracking and monitoring systems is easy	0.0%	2.9%	9.6%	47.1%	40.4%	4	1
Interacting with vehicle tracking and monitoring systems does not require a lot of skills	0.0%	0.0%	7.7%	50.0%	42.3%	4	1



## CHAPTER FIVE: INFERENTIAL STATISTICS AND FACTOR ANALYSIS RESULTS

### 5.1 Introduction

This chapter provides the results for exploratory factor analysis, correlation and ordinary least squares regression models. Exploratory factor analysis was used to identify factors that did not cluster appropriately. Whereas correlation tested the association between variables and OLS regression models were used to ascertain relationships between the study variables.

### 5.2 Exploratory Factor Analysis

Explanatory Factor Analysis (EFA) was performed to show whether the related items were clustered under the same factors or not. According to Hair et al. (2006), factor loadings should be between 0.3 and 0.4 to meet the minimal level. Table 5.1 below shows the each item's factor loading after rotation. None of the factor was deleted because they clustered appropriately.

**Table 5.1 Exploratory Factor Analysis (Adapted from Research Data, 2016)**

Variables	Factor loadings
<b>Adoption1</b> -Vehicle tracking software is applied by our organization to ensure efficiency	0.324
<b>Adoption2</b> -There's annual budget allocation toward the maintenance and acquisition of vehicle tracking software	0.479
<b>Adoption3</b> -Our organization undertakes training on the use of vehicle tracking software	0.999
<b>Awarenes1</b> -I am aware of the existence of vehicle tracking and monitoring systems	0.497
<b>Awarenes2</b> -I know and understand how vehicle tracking software work	0.813
<b>Awarenes3</b> -I am able to explain to my colleagues the functioning of vehicle tracking and monitoring software	0.777
<b>Awarenes4</b> -I can identify which vehicles have the vehicle tracking software installed	0.578
<b>Envi1</b> -Others people's attitudes can influence Kenya police intention to adopt vehicle tracking software	0.81
<b>Envi2</b> -Others people's behaviour can influence Kenya police intention to adopt vehicle tracking software	0.788
<b>Envi3</b> -Social pressure can influence Kenya police intention to adopt vehicle tracking software	0.84
<b>Envi4</b> -There are supportive technical infrastructure for the adoption f vehicle tracking software	0.601
<b>Envi5</b> -There is external pressure for the police force to adopt vehicle tracking software	0.521

<b>Variables</b>	<b>Factor loadings</b>
<b>Fin1</b> -There is inadequate budgetary allocation for Kenya police service	0.495
<b>Fin2</b> -Kenya police budget cannot finance for the adoption of vehicle tracking and monitoring in the service	0.652
<b>Fin3</b> -The adoption of vehicle tracking and monitoring software will compete with other projects for funding	0.42
<b>Fin4</b> -The adoption of vehicle tracking and monitoring software will strain the forces resources	0.512
<b>Tech1</b> -Vehicle Tracking and monitoring system is complex for Kenya police service	0.463
<b>Tech2</b> -Complexity of vehicle tracking and monitoring system affects its adoption	0.613
<b>Tech3</b> -Use of the tracking and monitoring system will make work difficult for police	0.89
<b>Tech4</b> -The adoption of vehicle tracking and monitoring software will strain the police	0.677
<b>PEOU1</b> -It easy to become skillful in vehicle tracking and monitoring systems	0.609
<b>PEOU2</b> -It does not require much effort to adopt and use vehicle tracking and monitoring systems	0.591
<b>PEOU3</b> -Adoption and use of vehicle tracking and monitoring systems is easy	0.556
<b>PEOU5</b> -Interacting with vehicle tracking and monitoring systems does not require a lot of skills	0.58
<b>Intention1</b> -Suppose you access to vehicle tracking and monitoring system will you adopt and use	0.89
<b>Intention2</b> -I can adopt the vehicle tracking and monitoring system if it is useful in your job.	0.76
<b>Intention3</b> -I can adopt the vehicle tracking and monitoring system if it is easy to use in my job	0.512
<b>Intention4</b> -I can adopt the vehicle tracking and monitoring system if it will increase performance of Kenya police	0.64
<b>PU1</b> -Adoption of vehicle tracking and monitoring software increases overall job productivity	0.686
<b>PU2</b> -Adoption of vehicle tracking and monitoring software will improve accountability	0.604
<b>PU3</b> -Adoption of vehicle tracking and monitoring software will be effective than the current manual system	0.593
<b>PU4</b> -Adoption of vehicle tracking and monitoring software will increase administrative savings	0.691

### 5.3 Correlation Results

The study conducted a correlation tests to ascertain the association between study variables and test the presence of multicollinearity among the study variables. The results in the table below indicate that there was no multicollinearity among the study variables. The presence of multicollinearity is detected when the correlation value is above +/- 0.7.

**Table 5.2 Correlation Results for Study Variables (Adapted from Research Data, 2016)**

		Awareness Mean	Environmental Mean	Financial Mean	Technology Mean
Awareness Mean	Pearson Correlation				
	Sig. (2-tailed)				
	N				
Environmental Mean	Pearson Correlation	0.087			
	Sig. (2-tailed)	0.38			
	N	104			
Financial Mean	Pearson Correlation	.310**	.463**		
	Sig. (2-tailed)	0.001	0		
	N	104	104		
Technology Mean	Pearson Correlation	.244*	.285**	.338**	
	Sig. (2-tailed)	0.013	0.003	0	
	N	104	104	104	
PU Mean	Pearson Correlation	.283**	.435**	.315**	0.055
	Sig. (2-tailed)	0.004	0	0.001	0.578
	N	104	104	104	104
PEOU Mean	Pearson Correlation	.322**	.343**	.440**	.246*
	Sig. (2-tailed)	0.001	0	0	0.012
	N	104	104	104	104
** Correlation is significant at the 0.01 level (2-tailed).					
* Correlation is significant at the 0.05 level (2-tailed).					

#### 5.4 Ordinary Least Regression Results

The study conducted OLS to tests the relationship between study variables. Three OLS regression models were conducted.

#### 5.4.1 OLS Results for Determinant for Perceived Usefulness

The first model had perceived usefulness as dependent variable and technology awareness, environmental context, financial resources and technological complexity as independent variables. The findings indicate that technology awareness and environmental context positively and significantly influenced perceived usefulness of vehicle tracking systems since their  $p$ -value  $< 0.05$  at 95% confidence level. Financial resources and technology complexity had positive and insignificant relationship with perceived usefulness.

**Table 5.3a OLS Results for Determinant for Perceived Usefulness (Adapted from Research Data, 2016)**

	B	Std. Error	Beta	t	Sig.
(Constant)	1.795	0.574		3.126	0.002
Technology Awareness	0.29	0.104	0.256	2.791	0.006
Environmental context	0.385	0.092	0.412	4.193	0.000
Financial resources	0.098	0.103	0.099	0.957	0.341
Technology complexity	-0.165	0.098	-0.158	-1.69	0.094
a Dependent Variable: PU					

#### 5.4.2 OLS Results for Determinant for Perceived Ease of Use

The study sought to find out the independent variables affect perceived ease of use of the tracking systems. The findings of this study indicate technology awareness and financial resources were significant predictors of perceived ease of use. This implies that when the individual are aware of the technology and have sufficient financial resources they likely to perceive new technology as easy to use. Environmental factors and technology complexity had insignificant relationship with perceived ease of use.

**Table 5.3b OLS Results for Determinant for Perceived Ease of Use (Adapted from Research Data, 2016)**

	B	Std. Error	Beta	t	Sig.
(Constant)	1.169	0.564		2.071	0.041
Technology Awareness	0.231	0.102	0.209	2.263	0.026
Environmental context	0.167	0.09	0.184	1.856	0.066
Financial resources	0.266	0.101	0.274	2.632	0.01
Technology complexity	0.051	0.096	0.05	0.529	0.598
a Dependent Variable: PEOU					

### 5.4.3 OLS Results for Determinant for Intention to Use

The study further analyse the effects of perceived usefulness and perceived ease of use on the intention to use vehicle tracking systems. The results show that perceived ease of use significant affected the intention to use. The relationship between perceived usefulness and intention to use was insignificant.

**Table 5.3c OLS Results for Determinant for Intention to Use (Adapted from Research Data, 2016)**

	B	Std. Error	Beta	t	Sig.
(Constant)	2.17	0.388		5.599	0.000
PU	0.129	0.077	0.152	1.679	0.096
PEOU	0.392	0.079	0.45	4.967	0.000
a Dependent Variable: Intention to use					

### 5.4.4 OLS Results for Effects of Intention to Use on Adoption

The study finally analysed the effects intention had on adoption of vehicle tracking systems. The results indicate that the relationship between intention to use and adoption of vehicle tracking and monitoring systems was significant at 95% confidence level. Intention to use accounted for 0.172 units in adoption of the system.

**Table 5.3d OLS Results for Effects of Intention to Use on Adoption (Adapted from Research Data, 2016)**

	B	Std. Error	Beta	t	Sig.
(Constant)	2.038	0.336		6.072	0
Intention	0.172	0.076	0.22	2.28	0.025
a Dependent Variable: Adoption					

## 5.5 Chapter Summary

This chapter contains the result for exploratory factor analysis and inferential statistics. The results for exploratory factor analysis revealed that all factors that were used load together. They imply that they were no underlying variables that affected the results. The chapter also contains the results of correlation and regression tests conducted to ascertain the relationship between study variables. Chapter six contain model assessment and validation results.

## CHAPTER SIX: PROPOSED MODEL ASSESSMENT AND VALIDATION

### 6.1 Introduction

This chapter contains assessment of the proposed model and validation of the model by testing the research hypotheses. The study used structural modelling technique to validate the model. Confirmatory factor analysis was also conducted to establish the model fitness. The study used SPSS-Amos to carry out these statistical tests.

### 6.2 Regression Weights-Default Model

The results from the structural model conducted are shown in Table 6.1 below. The p-value of below 0.05 implies that the null hypothesis was rejected meaning that the relationship was statistically significant. The result shows that the relationship between technology awareness, environmental context and technology complexity was statistically significant to Perceived Usefulness. Whereas financial resources and technology awareness was statistically significant to Perceived ease of use implying the two factor influenced Perceived ease of use. Perceived ease of use also had statistically significant relationship with intention to use. The results further imply that the intention to use significantly influenced adoption of the vehicle tracking systems. The relationship whose p-value was greater than 0.05 (Null hypothesis was accepted) imply insignificant relationship.



**Table 6.1 Regression Weights: (Group number 1 - Default model)**

Relationship			Hypotheses	Estimate	P-value	Decision
PU	<---	Tech Awareness	<i>HO<sub>2</sub></i>	.290	.004	Null Rejected
PU	<---	Environmental	<i>HO<sub>5</sub></i>	.385	***	Null Rejected
PU	<---	Financial	<i>HO<sub>8</sub></i>	.098	.329	Accepted
PEOU	<---	Financial	<i>HO<sub>7</sub></i>	.266	.007	Null Rejected
PEOU	<---	Technology complexity	<i>HO<sub>10</sub></i>	.051	.589	Accepted
PU	<---	Technology complexity	<i>HO<sub>11</sub></i>	-.165	.085	Accepted
PEOU	<---	Environmental	<i>HO<sub>4</sub></i>	.167	.058	Accepted
PEOU	<---	Awareness	<i>HO<sub>1</sub></i>	.231	.021	Null Rejected
Intention	<---	PU	<i>HO<sub>14</sub></i>	.129	.077	Accepted
Intention	<---	PEOU	<i>HO<sub>13</sub></i>	.392	***	Null Rejected
Adoption	<---	Intention	<i>HO<sub>15</sub></i>	.172	.023	Null Rejected

**6.3 Covariance -Default model**

The covariance analysis was conducted to measure of how much two random variables change together. The results show that the covariance of the study variables was significant implying that variables change together. The positive covariance indicates the variables increased together.

**Table 6.2 Covariances: (Group number 1 - Default model)**

			Estimate	S.E.	C.R.	P	Label
Awareness Mean	<-->	Environmental Mean	.017	.019	.879	.379	
Environmental Mean	<-->	Financial Mean	.104	.024	4.262	***	
Financial Mean	<-->	Technology complexity	.068	.021	3.251	.001	
Environmental Mean	<-->	Technology complexity	.061	.022	2.782	.005	
Awareness Mean	<-->	Financial Mean	.057	.019	3.001	.003	
Awareness Mean	<-->	Technology Mean	.043	.018	2.404	.016	

#### 6.4 Model Fitness Summary

To assess the model fitness the study used confirmatory factor analysis. The results for CMIN/DF, RMR, GFI and RMSEA that were used to test the goodness of fit of the model are given below.

**Table 6.3 CMIN**

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	25	121.804	11	.000	11.073
Saturated model	36	.000	0		
Independence model	8	277.951	28	.000	9.927

CMIN is a Chi-square statistic comparing the tested model and the independence model to the saturated model. CMIN/DF, the relative chi-square, is an index of how much the fit of data to model has been reduced by dropping one or more paths. The value of CMIN/DF is above the threshold of 5 meaning the model has good fitness. The P-value of less than 0.05 indicates poor fit.

**Table 6.4 RMR, GFI**

Model	RMR	GFI	AGFI	PGFI
Default model	.024	.826	.431	.252
Saturated model	.000	1.000		
Independence model	.058	.532	.398	.414

GFI, the goodness of fit index, tells you what proportion of the variance in the sample variance covariance matrix were accounted for by the model. This should exceed .9 for a good model. The GFI was .826 which is close to .9 implying the model was okay. AGFI (adjusted GFI) is an alternate GFI index in which the value of the index is adjusted for the number of parameters in the model. The fewer the number of parameters in the model relative to the number of data points (variances and covariances in the sample variance-covariance matrix), the closer the AGFI will be to the GFI.

**Table 6.5 RMSEA**

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.313	.264	.364	.000
Independence model	.294	.263	.326	.000

The Root Mean Square Error of Approximation (RMSEA) estimates lack of fit compared to the saturated model. RMSEA of .05 or less indicates good fit, and .08 or less adequate fit. LO 90 and HI 90 are the lower and upper ends of a 90% confidence interval on this estimate. PCLOSE is the  $p$  value testing the null that RMSEA is no greater than .05. The  $\chi^2$  statistic for model fit is significant, meaning that the null hypothesis of a good fit to the data can be rejected. The RMSEA likewise suggests that the fit of the model is questionable. The value of .313 exceeds the .05 suggested as a cut-off for accepting the model fit.

### 6.5 Validated Model

The overall model fit appears quite good. The  $\chi^2$  test yields a value of 121.804 which, evaluated with 11 degrees of freedom, has a corresponding  $p$ -value of .143. This  $p$ -value is too high to reject the null of a good fit.

**Table 6.6 Model Notes**

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Result (Default model)

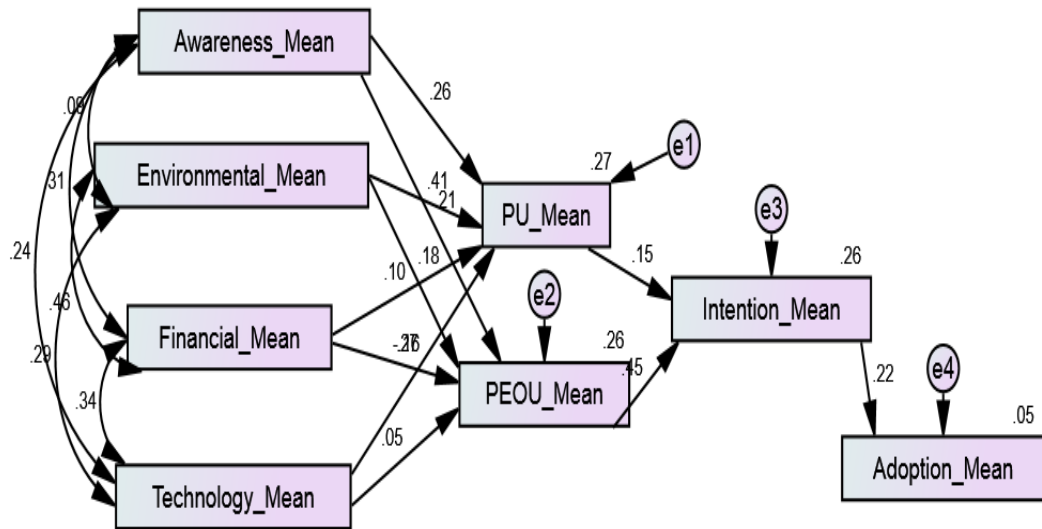
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Chi-square = 121.804

Degrees of freedom = 11

Probability level = .143

---



**Figure 6.1 Validated Model**

The result in the validated model indicates that technological awareness, environmental context, financial resources and technological complexity account for 27% for the variation in PU. The same variables account for 26% for the variation in PEOU. The results also show that PU and PEOU account for 26% of the variation in Intention to use.

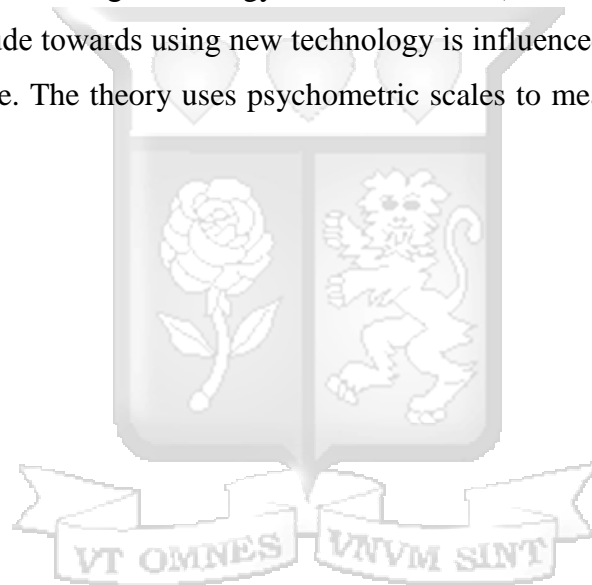
## 6.6 Discussion of the Results

The findings of this study indicate that technology awareness, environmental context and technology complexity was statistically significant to Perceived Usefulness. These findings concur with those of Nzomoi *et al.* (2007) who sought to establish the factors influencing technology adoption in the horticultural sector in Kenya. Nzomoi *et al.* (2007) recommended that more education and training to be given to farmers, increased government participation, increasing ease of accessing credit for the farmers.

The study also established that the relationship between technology awareness, environmental context and technology complexity was statistically significant to Perceived Usefulness. Whereas financial resources and technology awareness was statistically significant to Perceived ease of use implying the two factor influenced Perceived ease of use. Perceived ease of use also

had statistically significant relationship with intention to use. The results further imply that the intention to use significantly influenced adoption of the vehicle tracking systems. These findings agrees with the findings of Bett (2012), Wang and Potter (2007), Karake (2014) and Nyongesa (2013) who investigated adoption of technology and found that perceived usefulness, technology awareness and perceived ease of use were important factors in adoption of different technology.

The findings of this study also concur with the Technology Acceptance Model (TAM) developed in 1989 by Fred Davis. The model advances two aspects which influence the level of technology acceptance which are perceived usefulness and perceived ease of use. Perceived usefulness (U) is the level to which the user perceives the technology in terms of efficiency while perceived ease of use (EOU) is the user's relating technology to ease of work (Davis, 1989). The theory argues that the consumers' attitude towards using new technology is influenced by perceived usefulness and perceived ease of use. The theory uses psychometric scales to measure usefulness and ease of use.



## **CHAPTER SEVEN: SUMMARY, CONCLUSION AND RECOMMENDATION**

### **7.1 Overview**

This chapter addresses the summary, conclusions and the recommendations. This is done in line with the objectives of the study. This chapter summarizes the findings of the study and makes conclusions upon which recommendations are drawn.

### **7.2 Summary**

The purpose of this study was to formulate a model for the adoption of tracking and monitoring software for police vehicles in the Kenyan police service. The study sought to investigate the influence of technology awareness, environmental context, technology complexity and financial resources on both perceived usefulness and perceived ease of use. The effect of perceived usefulness and perceived ease of use on intention to use was further tested. The summary of the summary based on research hypotheses is given below.

#### **7.2.1 Technological Awareness**

Technology awareness refers to the awareness by the environment about the human and environmental processes and their interaction. The results of this study showed that technology awareness significant affected both perceived usefulness and perceived ease of use. Studies have shown that the level of awareness significant affect the adoption of technology. For instance, Simtowe, Muange, Munyua and Diagne (2012) investigated technology awareness and adoption a case of improved pigeon pea varieties in Kenya. The findings suggested that there is scope for increasing pigeon pea technology adoption once the farmers are exposed to the new technologies and once the associated constraints are addressed. The null hypotheses that technology awareness has no effect on perceived usefulness and perceived ease of use were rejected.

#### **7.2.2 Environmental Context**

Environmental factors tested in this study include other people's attitudes and behaviors and social pressures imposed to the individuals. The study findings showed that environmental factors significantly affect PU but had insignificant relationship with PEOU. Environmental factors capture that how individuals who are important for end users have an effect on them towards using a system. Previous studies indicate that subjective norm as an environmental facto

has a direct relation with both Perceived Usefulness and perceived ease of use in the scope of adopting e-learning systems (Wang & Wang, 2009).

### **7.2.3 Financial Resources**

The study also investigated the effects of financial resources on both perceived usefulness and perceived ease of use. The results showed that financial resources had a significant relationship with perceived ease of use but the relationship with PU was insignificant. Similarly, Hall & Khan (2003) in their study on adoption of new technology suggested that the obvious determinants of new technology adoption are the benefits received by the user and the costs of adoption.

### **7.2.4 Technology Complexity**

The study also investigated the effects of technological complexity on both perceived usefulness and perceived ease of use. TC is defined as the degree to which technology is perceived as relatively difficult to understand and use (Thompson, Higgins, and Howell, 1991). The results showed that technological complexity had insignificant relationship with both perceived ease of use and PU. This finding contradicts the findings of previous study that investigated effect of TC on PEOU to explain pre-service teachers' intention toward technology use (Teo, 2009). The study stated that if a technology perceived as being difficult, it is perceived as being tedious and time consuming, which results in a lot of effort to be spent to benefit from it.

### **7.2.5 Perceived Usefulness**

Perceived Usefulness is defined as the degree to which an instructor believes that using such systems will enhance his or her performance. The study sought to establish whether perceived usefulness affected the intention to use of vehicle tracking systems. The findings showed that perceived usefulness had a positive and significant relationship with intention to use. The findings also revealed that perceived usefulness was correlated to perceived ease of use. This finding agrees with those of Chang and Tung (2008) who argued that perceived usefulness affects the intention to use of new technology.

### **7.2.6 Perceived Ease of Use**

Perceived Ease-of-Use (PEOU) are grouped under indicative factors to evaluate that how system's utility and easiness affect users' perception and intention to system use. Based on the study findings PEOU was revealed to be the key factor that affects the behavioral intention to use technology. The findings of this study support those by Chang and Tung (2008) who stated that both PU and PEOU directly affect the intention to use and adoption of technology.

### **7.2.7 Intention to use**

The results of this study revealed that intention to use was highly related to adoption of vehicle tracking and monitoring systems.

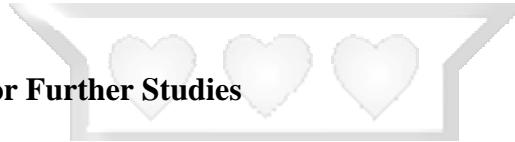
## **7.3 Conclusions**

This study aimed to propose a vehicle tracking and monitoring systems adoption model from the perspective of Kenya police service. The model comprised of four dimensions – technology awareness, environmental context, financial resources and Technological complexity and a scale was developed to examine the relations among their variables. Validity tests have proved that the following variables and their corresponding dimension of the model were significant in explaining the behavioral perceived usefulness and perceived ease of use of police towards vehicle tracking and monitoring systems use. Perceived Usefulness and Perceived Ease of Use were also significant in explaining the behavioral intention to use of police towards vehicle tracking and monitoring systems use. The final model explained a significant amount of the variance of behavioral intention towards vehicle tracking and monitoring systems use ( $R^2 = 0.26$ ). The results provide considerable insights about Kenya police service adoption of vehicle tracking and monitoring systems in their service to the public. Moreover the findings of this study contribute to the e-learning literature by identifying the factors that influence Kenya police service adoption of vehicle tracking and monitoring systems for successful system use in learning and teaching in higher education.

## **7.4 Recommendations**

### **7.4.1 Recommendation for Practice**

Based on the study findings, the study recommends that the Kenya police service should consider adopting the proposed model in implementing vehicle tracking and monitoring systems. The study also recommends that the Kenya police service should train their officers on the vehicle tracking and monitoring systems. Kenya police service should also allocate funds in their budget to implement the installation and training on tracking and monitoring systems. The research sets a baseline from a demand side point of view. The supply side (developers) can use this information to see how best to develop tracking systems that would appeal to users and be highly adopted.



### **7.4.2 Recommendation for Further Studies**

The proposed adoption model is not a fixed and unchanged model and is open to continuous development. Future studies may extend or modify this adoption model through adding other dimensions or external variables valid for various educational level contexts, i.e. elementary level education, etc. For future work, the validated research model and the developed scale could be taken as a basis forming a starting point when developing other instruments for vehicle tracking and monitoring systems evaluation with respect to other educational level instructors' perceptions. In addition, future research should be on already adopted systems and the challenges facing implementation of tracking systems as the current research was dealing with the question of adoption only.

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## APPENDICES

### Appendix A: Study Questionnaire

Please answer the questions in the next sections. Tick the most applicable response.

#### **SECTION 1: BASIC INFORMATION**

1. Name of the Police Post.....

2. What is your gender

a) Male

b) Female

3. What is your rank in the police service (tick one)

a) Constable

b) Sergeant

c) Senior Sergeant

d) Inspector

4. How many years have you been in the service?

a) Less than 3 years

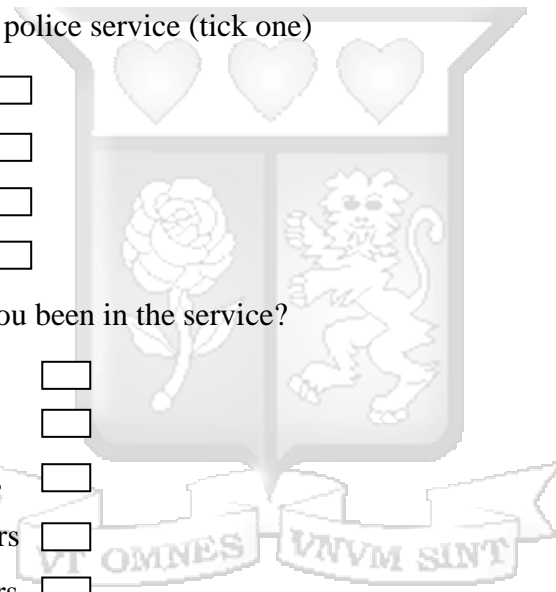
b) 3 to less than 6 years

c) 6 to less than 10 years

d) 10 to less than 15 years

e) 15 to less than 20 years

f) 20 years and above



#### **SECTION 2: ADOPTION OF VEHICLE TRACKING SOFTWARE**

Do you have an IT department in your police post

a. Yes

b. No

Do you have any vehicle tracking software for vehicles in your post?

a. Yes

b. No

If yes, please mark (x) in the box which best describes your agreement or disagreement on each of the following statements

Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Vehicle tracking software is applied by our organization to ensure efficiency					
There's annual budget allocation toward the maintenance and acquisition of vehicle tracking software					
Our organization undertakes training on the use of vehicle tracking software					

### SECTION 3: INTENTION TO ADOPT VEHICLE TRACKING SOFTWARE

If yes, please mark (x) in the box which best describes your agreement or disagreement on each of the following statements

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Suppose you access to vehicle tracking and monitoring system will you adopt and use					
I can adopt the vehicle tracking and monitoring system if it is useful in your job.					
I can adopt the vehicle tracking and monitoring system if it is easy to use in my job					
I can adopt the vehicle tracking and monitoring system if it will increase performance of Kenya police					

**SECTION 4: FACTORS AFFECTING THE ADOPTION OF VEHICLE TRACKING SOFTWARE**

**SECTION 4A: Awareness of the software**

Please mark (x) in the box which best describes your agreement or disagreement on each of the following statements.

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I am aware of the existence of vehicle tracking and monitoring systems					
I know and understand how vehicle tracking software work					
I am able to explain to my colleagues the functioning of vehicle tracking and monitoring software					
I can identify which vehicles have the vehicle tracking software installed					

**SECTION 4B: Environmental context**

Please mark (x) in the box which best describes your agreement or disagreement on each of the following statements.

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Others people's attitudes can influence Kenya police intention to adopt vehicle tracking software					
Others people's behaviour can influence Kenya police intention to adopt vehicle tracking software					
Social pressure can influence Kenya police intention to adopt vehicle tracking software					
There are supportive technical infrastructure for the adoption f vehicle tracking software					
There is external pressure for the police force to adopt vehicle tracking software					

#### SECTION 4C: Financial Resources

Please mark (x) in the box which best describes your agreement or disagreement on each of the following statements.

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
There is inadequate budgetary allocation for Kenya police service					
Kenya police budget cannot finance for the adoption of vehicle tracking and monitoring in the service					
The adoption of vehicle tracking and monitoring software will compete with other projects for funding					
The adoption of vehicle tracking and monitoring software will strain the forces resources					

#### SECTION 4D: Technology Complexity

Please mark (x) in the box which best describes your agreement or disagreement on each of the following statements.

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Vehicle Tracking and monitoring system is complex for Kenya police service					
Complexity of vehicle tracking and monitoring system affects its adoption					
Use of the tracking and monitoring system will make work difficult for police					
The adoption of vehicle tracking and monitoring software will strain the police					

**SECTION 4E: Perceived Usefulness**

Please mark (x) in the box which best describes your agreement or disagreement on each of the following statements.

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Adoption of vehicle tracking and monitoring software increases overall job productivity					
Adoption of vehicle tracking and monitoring software will improve accountability					
Adoption of vehicle tracking and monitoring software will be effective than the current manual system					
Adoption of vehicle tracking and monitoring software will increase administrative savings					

**SECTION 4F: Perceived Ease of Use**

Please mark (x) in the box which best describes your agreement or disagreement on each of the following statements.

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
It easy to become skillful in vehicle tracking and monitoring systems					
It does not require much effort to adopt and use vehicle tracking and monitoring systems					
Vehicle tracking and monitoring systems is straight forward and easy to understand					
Adoption and use of vehicle tracking and monitoring systems is easy					
Interacting with vehicle tracking and					

monitoring systems does not require a lot of skills

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