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Determinants of smartphones adoption and use at Kenya Airport Police Unit, Kenya

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ABSTRACT

The Kenya Airport Police Unit has started using smartphones to deter crime, but there are still reservations about their potential impact on policing. The study sought to identify the factors that influence police officers' adoption and use of smart phone applications for crime prevention. The police officers assigned to the Kenya Airport Police Unit (1382) were the study's target group. For this study, a sample of 274 police officers was selected using a simple random sampling approach. The study was guided by the Mobile Technology Acceptance Model (M-TAM), which discovered that smartphones were useful instruments for crime prevention. Police officers discovered that programs such as Facebook, WhatsApp, Twitter, emails, and short text messages helped to prevent crime. The study suggests that tailored police smart phone applications be developed, as well as officer capacity training, to improve their utilization and help to crime prevention efforts.

Introduction

ICT innovation has transformed police smartphone technology. Law enforcement and knowledge exchange have profited from technological advancements. Lindsay and colleagues (2009; 2014) It should be remembered that modern crimes are virtually borderless, and that the use of technology in law enforcement, in addition to traditional police practices, is unavoidable and should be without limits.

Citizens in Sweden can help the police by using social media apps on their smartphones, such as Twitter and Facebook. This technology has expanded from big cities to rural police departments in order to convey local safety information with law enforcement. Ceccato and Dolmen (2013).

In South Africa, Dlodlo et al. (2015) recognised the police's principal concern as a year-on-year drop-in crime rate. In doing so, the Internet has been used to ensure global security and to encourage crime-solving solutions. Kenya's National Police Service is required to provide security, safeguard the environment, maintain peace, and protect life and property. It also prosecutes offenses, gathers information, deters and detects criminal activity, searches for suspects, and enforces all laws and legislation assigned to it. The National Police Service is expected to assist those in need in accordance with the National Police Service Act 2011.

A National Police Policy Task Force report (2009) highlighted flaws in police agencies' structural difficulties in utilizing contemporary technology. Basic information and communication capabilities, facilities, and equipment were lacking, as was an integrated computer network and communication system connecting police stations. This jeopardizes the police's ability to employ quick and low-cost contact devices for law enforcement operations. The police have failed to give important facts or evidence to aid them not only in finding suspects, but also in educating them on crime statistics or patterns, as well as in case processing.

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According to the National Police Service's 2014 annual survey, 69,736 criminal offenses were reduced by 2096, or 3%, compared to 71,832 criminal cases in 2013. The overall crime reported in 2013 was 6,020 cases or less, or 7.7 percent, less than the 77,852 crimes reported in 2012. For the previous 5-10 years, Nairobi has been a leading hub in ICT developments in Africa, with tremendous advancement in the usage of smartphone technology (Frilander et al. 2014).

Although ICT adoption has been rapid in Kenya, the Kenya Airport Police Unit has not systematically integrated ICT into its activities, instead relying on face-to-face contact and occasionally radio. Individual police officers use their smartphones to do public relations on a daily basis. Despite not being given priority owing to resource constraints, the need of expanding ICT uses as part of reforms began in 2009.

Today's mobile phones are an all-encompassing and widespread instrument that has become such an integral part of a person's everyday life that it supports freedom of communication. It is transforming people's life from a mere 'technical object' to a key'social object,' according to Srivastava (2005). The smartphone market is rapidly expanding, and manufacturers are progressively customizing mobile devices to their customers' interests and preferences. The usage of smartphones has had a wide-ranging impact on human behavior, including identification and social contact, as well as social life.

Rapid technical changes have happened in the security and police sectors in recent decades. While IT has brought substantial advancements in mobile phones, Koper et al. (2014) observed that there are numerous technologies that have a big impact on police departments, such as closed-circuit television (CCTV), license plate readers, DNA testing, and video surveillance systems. It's also important to realize that law enforcement agencies spend a lot of money on technology to improve their efficacy and efficiency. This is because the global war against crime has posed a significant challenge to law enforcement agents in recent years (Quarshie, 2014).

The study's goal is to investigate the characteristics that influence police officers' adoption and use of smart phone crime prevention applications. The Kenya Airport Police Unit's crime prevention efforts were examined using the Mobile Technology Acceptance Model (M-TAM) to uncover factors impacting officers' use of smart phone apps such as Facebook and WhatsApp. The report recommends specialized applications and officer capacity training to improve their use and efficacy in crime prevention efforts.

Literature Review

Theoretical Review

TAM (Technology Acceptance Model) is a theory of information systems that shows computerized technology users accepting and using it. Davis (1989) developed it to describe the behaviour of computing. It suggests that a variety of variables influence the choice of how and when to use it, if users have a new software package available. There are other models that may also be used to forecast and explain why users support or disapprove of the information system including the theory of Diffusion of Innovations, the model of Concern Based Adoption and the theory of Social Influence. As a model and useful for explaining the behaviour and attitude of the user on the social networking of crime prevention, TAM is simple and robust enough as noted by Dhume, et al, (2012). The decision to adopt and use technology in an organization is relevant for its usefulness. Their variation is based on changes in reasoned and planned behaviour theories in order to examine individual use of information technology. TAM elements are seen as useful and user-friendly, as demonstrated by Jokonya, when their use contexts are stated by Jokonya, (2015). A valid prediction of the behaviour of a user is the intention of using information technology.

E.M. Rogers developed the diffusion of innovation theory in 1962, one of the first in social science. It was first used in communication to explain how a concept or product gradually gains acceptance before being diffused throughout a certain demographic or social system. As a result of this dissemination, people gradually adopt the novel idea, activity, or object as a part of a social system. A behaviour is referred to as being adopted when it deviates from what the person has previously done. A person must find a notion, activity, or product innovative or novel in order to embrace it. This enables the spread to take place.

Venkatesh and Davis (2000) have suggested Model 2 of the technology acceptance model and have expanded the original TAM with additional main determinants for TAM PU constructs. It encompasses social impacts such as subjective norm, volunteering, image and experience and cognitive processes. The importance of work, the quality of the output and the result are cognitive instruments. Subjective norm recognizes the impact of peers as to whether they should conduct themselves; voluntary accounting for effects of mandatory and non-compulsory uses on the purpose of use; picture refers to the degree that technology can affect an individual's status; and experience demonstrates that a subjective norms direct effect can decrease over time by raising system experience. Job relevance dictates what tasks a given system can perform; performance quality positions are taken to measure how successfully a system completes tasks, and demonstrability of results is the degree to which the effects of adopting a technology can be shown (Venkatesh & Davis, 2000).

Empirical Review

According to TAM, PEOU is a crucial factor in the adoption of a particular technology. When a user considers using technology, they typically expect to exert a lot of physical and mental effort. PEOU describes how much effort-free a given technological system would be (Davis, 1989). According to Lim and Ting (2012), interfaces on online shopping websites and other pervasive technologies are important elements of what makes a technology simple to use. According to a 2009 study by Selamat et al., more clients are more

likely to accept a technology. One technology may be perceived as being simpler to use than another, yet consumer perception of a technology's complexity affects how quickly it is adopted.

Long-standing research connects mindset to intent (Suki & Ramayah, 2010). Ajzen and Fishbein (1977) separated attitude into two distinct constructs: attitude toward the behavior and attitude toward the object. The former refers to an individual's evaluation of a specific object, whereas the latter refers to an individual's evaluation of a specific act. As a result, the second attitude classification is altered to act as the theorized operationalization of attitude for the TAM model. In its modified form, this attitude classification refers to the affective reaction that mediates beliefs and intentions to use a target system based on its utility and simplicity of use (Suki & Ramayah, 2010). When it comes to making purchases online, a retailer's website serves as the main point of contact a customer has with an online retailer during an online purchase (Ahn, et al., 2004). Previous researchers have stressed the importance of comprehending consumer expectations and how they feel about the websites they frequent (Celik, 2008). Cronan's and Al- Rafee's (2006) research revealed attitude to be the most important dimension determining behavioural intention. Notably, a consumer's propensity to engage in online buying increases with how happy they feel about the practice (Ahn, et al., 2004).

PU is another significant aspect in the TAM model that influences attitudes toward usage (Davis, et al., 1989). How much a user (PU) anticipates a technological advancement will improve how something is carried out (Davis, 1989). According to Tyagi (2018)., it was found that crucial factors determining what defines a successful consumer buying activity include the capacity to increase shopping performance, shopping productivity, and most importantly achieving shopping goals (2004). According to Barkhi et al (2008), customers will have positive perceptions of goods and/or services that they think offer sufficient advantages or qualities to address an issue and negative opinions of those that fall short. Given this situation, Mutuku, Muathe and James (2019) asserted that users would find online shopping sites valuable if they offered tools to help them make better purchases. The same justification can be shown in Bisdee's (2007) research, which demonstrates that customers will have a positive attitude about online purchasing when a site is able to offer them helpful services and services that are not accessible through traditional shopping (for example, comparison between products at a glance). Findings by Childers et al. (2001), which support this hypothesis, show that customers with favorable opinions regarding online buying thought that online retailers were important because they could improve their purchasing productivity, effectiveness, and capability.

Numerous research has empirically supported the relationship between perceived ease of use and perceived usefulness (King & He, 2006). A technology is more likely to be seen favorably by users, given all other things being equal, if they think it's simple to use (Mutuku, Muathe & James, 2019). The relationship is still paradoxical, though (Aladwani & Palvia, 2002). Gefen and Straub (1997) came to the conclusion that the relationship was not important in forecasting the adoption of email as a technology, although more recent studies (such as Ndubisi et al. 2001; Shyu & Huang, 2011) contradicted this conclusion. However, current studies in the field of electronic commerce have shown a connection between the two since, according to Ramayah and Ignatius's (2005) argument, customers who believe online purchasing is simple should also exhibit a propensity for it to consider it valuable. This tendency can be explained by the fact that consumers naturally attempt to shape their perceptions of online buying based on their personal experiences participating in online purchasing and the simplicity with which the activity was carried out. This is consistent with Mutuku (2019) research, which contends that consumers will view online buying as more valuable if it is made simpler for them to utilize the websites.

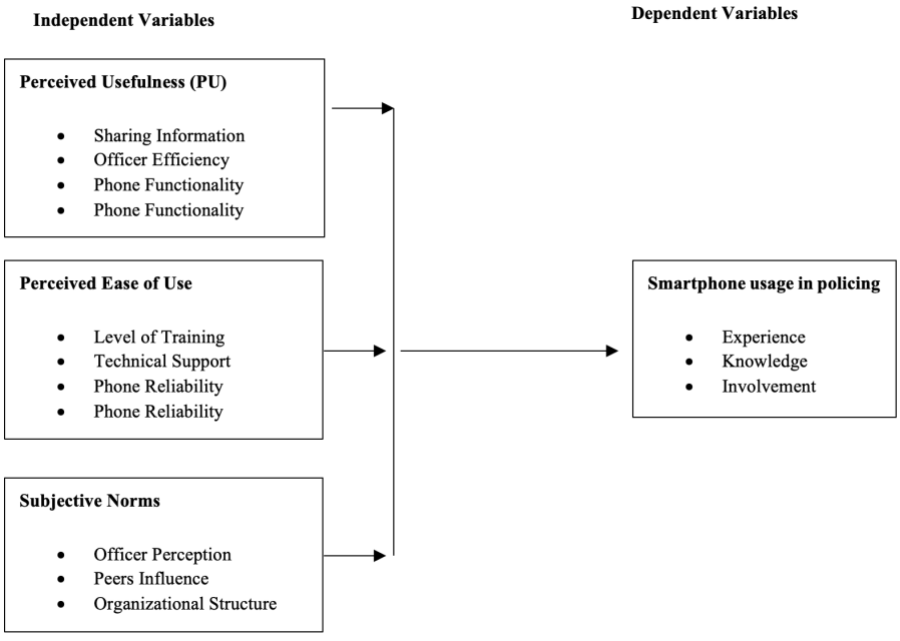

Figure 1: Schematic Diagram; *Source:* Adapted M-TAM by Lindsay et al (2014)

Orodho claims that the conceptual setting clarifies the relationship between the study variables (2009). According to Jabareen (2009), a variable is an observable function that might have various values for different people. The element affecting or controlling a dependent variable is known as an independent variable (Jabareen, 2009). Like an independent variable, a variable depends on another one. An element is dependant. In this instance, smartphone use is the dependent variable, we employ subjective norms, perceived utility, and perceived usability as our independent variables.

Research and Methodology

Research design, according to Cooper and Schindler (2003), serves as the guide for acquiring, measuring, and estimating data for a study. Rajendra (2008) claims that a research design is the linking and organizing of the conditions for data collection and analysis with the goal of balancing process economy with relevance to the research purpose (Ozcelik & Ferman, 2006). The research design for the study was descriptive. The properties specified in a research question were measured using a descriptive research design, which is specifically created and often arranged for this purpose. The adoption and use of smartphones at Kenya Airports Police Unit, Kenya, was being investigated in that study, hence a descriptive research methodology was applicable.

Empirical Model

In order to facilitate input to the machine, data generated from open ended questions was coded. For research, Ms. Excel enters data and is then moved to the Social Science Statistical Kit (SPSS). Descriptive statistical methods and procedures was employed to analyse the data set. The quantitative data was analysed via SPSS package using frequencies and percentages. Also included in the study are descriptive statistics, such as minimum, maximum, mean and standard deviation.

After the analysis, the data was presented in diagram and tabular form. After interpreting their meanings, qualitative data was analysed thematically. The topics were then arranged according to research goals. The results were presented as tables, pie charts, or bar graphs depending on the situation. The relationship between the variables was ascertained using inferential statistics, like multiple regressions. The study also employed a regression model to clarify the connection between subjective norms and smartphone adoption and use at the Kenya Airport Police Unit. The subsequent diagnostic tests were carried out to ensure that the regression assumptions were valid.

The multiple regression equation took the form as expressed below.

$$Y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \varepsilon$$

Whereby, Y = Smartphone Usage in Policing

X1= Perceived Usefulness
X2= Perceived Ease of Use
X3= Subjective Norms
β1, β2, β3 are Beta coefficients.
ε is the error term.

Findings

The results of data analysis are presented as follows; Descriptive analysis and regressions analysis.

Descriptive Results

Table 1: Responses on Police officer's usage of the smart phone in crime prevention

	n	Mean	Std. Deviation
I did learn to use mobile phone applications quickly	133	4.331	.5326
The smart phone applications provide information I need to respond to calls for service	121	4.256	.8117
The smart phone applications provided information on suspects, wanted persons and other matters of interest in policing	137	3.723	1.110
When making decisions about crimes problems, I tend to rely on my own experience rather than the smart phone applications	137	4.124	.7220
I'm likely to adopt use of smart phone applications to conduct my daily police tasks	140	3.607	1.104

Source: Study Data (2022)

The adoption of smart phone has revolutionized every single aspect of the administration and governance globally. This study sought to establish the extent to which police officers recognize ease of use of the smart phone in crime prevention. The study evaluated level of agreement on various aspects of smart phone technology adoption in day-today police work using 5-level Likert scale.

The study found that most respondents had learnt to use smart phone applications quickly as implied by a mean and standard deviation of (4.331, 0.5326); the police felt that smart phone application provided the information that they needed to respond to call of service as implied by a mean score of (4.256, 0.8117) which included information on suspect, wanted person and other matter of interest in policing (3.723, 1.110). The findings are consistent with Lindsay et al, (2009) studies which found the smart phone technology has positive impact on policing and knowledge sharing.

When making decisions about crime problems, most police officers argued that they consulted more on previous experience as opposed to the smart phone application (4.124, 1.104). On likelihood of adopting smart phone application on conducting police daily work task, the respondent tended to agree on incorporation with relative proportion inclining to indecisiveness as shown by a mean and standard deviation (3.607, 1.104). These findings are summarized in table 4.3 This finding are in line with Lindsay et al (2009) study observation that it may be due to lack of police institution providing an avenue for keeping its staff up to date on events.

Police officers were further asked to delineate other ways in which smart phone affects their role in crime prevention. According to the study findings, it was realized that majority of the police officers outlined that the smart phone was helpful in that it assists in cases of tracking the suspects through their gadgets, the approach had eased the passage of information about suspects and also in the research of information and records. However, majority of the officers stated that the use of smart phone was making them prone to criminals thus endangering their life's while on duty due to the aspect of some officers leaking information to criminals through the smart phone gadgets thus making it difficult to get hold of them. They also argued that communication and sharing information about crime by sharing images of wanted persons in various WhatsApp groups and Facebooks social media platforms had proved effective together with calls receptions though the same platform was alluded to be practically used by suspects and criminals to shield themselves from being caught.

Test of Hypothesis

To test the relationship between use of smart phone and crime prevention, the study found that the perceived usefulness, perceived ease of use and subjective norms of mobile phone applications explains 28.7% of crime prevention. The results on the fitted model are presented in tables 2 to 4.

Table 2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.536(a)	.287	.270	.988

Source: study Data (2022); *Note:* Predictors: Individual Police Norms, Police smart phone technology usage effort, Usage of smart phone; Dependent Variable: prevention of crime

The study further tested the ability of regression model to predict crime prevention at α=0.05, the study found that the model significantly predicted the crime prevention.

ANOVA Results

The ANOVA results for regression model fitted for Determinants of Smartphones Adoption and Use was statistically significant as indicated in Table 3.

Table 3: Significance of regression model

	Sum of Squares	df	Mean Square	F	Sig.
Regression	47.951	3	15.984	16.381	.000(a)
Residual	119.041	122	.976		
Total	166.992	125			

Source: Study Data (2022**);** *Note:* Predictors: (Constant), Individual Police Norms Police smart phone technology usage effort, Usage of smart phone; Dependent Variable: prevention of crime

Only Police smart phone technology usage effort among variables contributing to the model were found significant at α=0.05

The main aim of multiple regression is to better understand the association between the determinants of smartphones adoption and use. The study used SPSS to enter and code responses from the respondent to assist in computing the extent to which a unit changes in a given independent variable cause a change to dependent variable. Table 3 and 4 presents the multiple regression.

Table 4: Coefficients of regression model

	Unstandardized Coefficients		**Standardized Coefficients**	**t**	**Sig.**
	B	Std. Error	Beta		
(Constant)	-1.101	.684	.229	-1.610	.110
Usage of smart phone technology	.521	.228		2.284	.024
Police smart phone technology usage effort	.554	.184	.291	3.008	.003
Individual Police norms	.231	.225	.113	1.027	.306

Source: Study Data (2022); *Note:* Dependent Variable: prevention of crime; The variable contributing to the model can be fitted as shown below.

Crime prevention =-1.101+0.521(Usage of smart phone technology) +0.554(Police smart phone technology usage effort) + 0.231(Individual Police norms).

The research findings indicated that Perceived Usefulness, Perceived Ease of Use and Standard norms determines the adoption and use of smartphones at Kenya airports Police Unit, Kenya all other factors held constant.

Conclusions

According to the conclusions of this study, smart phone applications have transformed the police crime prevention unit to some extent, however they still require full adoption. The introduction of numerous applications such as Facebook, Twitter, emails, short text messages, and the WhatsApp social networking platforms has accelerated the usage of smart phones in crime. This approach has made the police officer's crime prevention tasks a little easier, but there is still work to be done in terms of the police officer's use of smart phones, personal norms (cognitive acceptance), effortlessness, and the police organization's management style in order to effectively enhance crime prevention through this platform. The usage of smart phone technology by police has been shown to have a major positive impact on crime prevention.

Based on the study's findings, we recommend the following:

i. To improve efficiency in crime prevention considerations, police officers should be supplied with smart phones, in-serviced, and trained on smart phone application usage.
ii. The management of the police organization should create a database that integrates all police stations or develop a smart phone application for police personnel and a specific crime unit domain so that reports and access to reported cases can be easily and securely shared on a secure platform.
iii. The police organization's administration must give technical and financial support to officers in order to motivate them to enhance their productivity and responsibility.

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