



Role of Information Communication and Technology in Enhancing Security in Urban Areas in Kenya: A Literature Based Review

Pamela Cherotich Samoei

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^{1*}**Pamela Cherotich Samoei**

^{1*}**Post Graduate Student**

Jomo Kenyatta University of Agriculture and Technology, Kenya

***Corresponding email: pamela.samoei@gmail.com**

How to cite this article: Pamela, C. S., (2018), Role of Information Communication and Technology in Enhancing Security in Urban Areas in Kenya: A Literature Based Review. *Journal of Information & Technology*, Vol 2(1) pp. 17-27.

Abstract

ICT and other advanced technologies are becoming a powerful tool for responding to criminals, engaging in hotspots policing, solving violent crimes, monitoring employees' performance and many other functions. Technologies, such as video cameras, data mining systems, heat sensors, biometrics, GPS tracking, and Internet and telecommunication systems are being used for the detection, investigation, prosecution and prevention of crime in the law enforcement and security sector. The purpose of the study was to establish the role of information communication and technology in enhancing security in urban areas in Kenya: A literature based review. The paper used a desk study review methodology where relevant empirical literature was reviewed to identify main themes. A critical review of empirical literature was conducted to establish the role of role of information communication and technology in enhancing security in urban areas. It was established that technology is critical to enhancing security in urban areas and in the country at large. Today's urban cities face a number of threats on a daily basis, it is essential to have a complete view of their operations and the local area at all times. Technologically enables collective

action and offers a viable near-term complement to traditional crime fighting efforts in urban areas. ICT makes it easier for public groups and NGOs to organize responses to crime and even to highlight and thereby decrease instances of security officers' incompetence and corruption. The study concluded that several methods could be satisfactorily adopted for crime-based prevention and use of technology after identifying the spots. Places where there is high rate of crime, implementation of vigilance with CCTV, situational crime prevention methods and checking the geographical unit where crime rate is high and less. The study recommended the implementation of an information-sharing platform between agencies to enhance security in urban areas. This platform would provide information to the various security agencies. Further information from the various security agencies should be interlinked to provide real time information that can be used to avert crime activities in the urban areas.

Key words: *Information Communication and Technology, Security, Urban Areas, Kenya.*

1.0 Introduction

Urban cities pose challenges to the security and privacy of citizens and government alike. The security issues associated with the information produced in a urban city extend to relationships among those citizens, as well as their personal safety. Kenya has three major cities that are Nairobi, Mombasa and Kisumu. The greatest threats in these urban cities continue to be road safety and crime. Street crime is a serious problem particularly in Nairobi, Mombasa, and other large cities. Most street crime involves multiple armed assailants. In some instances, large crowds of street criminals incite criminal activity, which has the potential to escalate into mob violence with little notice (Skilling & Rogers, 2017). Along with other crimes of opportunity, pickpockets and thieves often carry out snatch-and-grab attacks in crowded areas and from idle vehicles in traffic. However, police often lack modern technological equipment, resources, training, and personnel to respond to calls for assistance or other emergencies.

ICT and other advanced technologies are becoming a powerful tool for responding to criminals, engaging in hotspots policing, solving violent crimes, monitoring employees' performance and many other functions. Technologies, such as video cameras, data mining systems, heat sensors, biometrics, GPS tracking, and Internet and telecommunication systems are being used for the detection, investigation, prosecution and prevention of crime in the law enforcement community. As it did in the middle of the 20th century, technology is beginning to alter the nature of policing and to impact on the management and delivery of police services (Nunn, 2013). Emerging models of policing in the 21st century demand accurate real-time information for strategic planning, problem analysis, deployment decisions, community interface, inter-organizational communication, accountability, threat detection and many other functions.

The uses of technology within the police forces in England have greatly increased the way in which the police serve and protect the population for the better. The aims of the Police force in England has been and will always be to both solve crime and to try to prevent it from happening. The way in which the police go about investigating crimes has been revolutionized by the improving technology that has become available to the police. The police use ICT to aid in monitoring road traffic, where officers can watch traffic images live and direct them on the ground to incidents by use of CCTV. The Metropolitan Police in London is one of the largest CCTV schemes. It monitors the M25 and all the routes in and out of London including the main roads in central London (London Assembly, 2016).

Western Australia Police have reduced crime through the use of predictive analytics and GPS maps which show crime hotspots in the state. By using business intelligence (BI) it has been able to build up a picture of crimes committed over the past five years. The police have combined data from other government agencies to identify areas of social disadvantage. Bus routes and CCTV data have also been overlaid on to the map (Farrell, Tseloni, Mailley & Tilley, 2013).

The Police in Australia use data to assign patrols to hotspot areas in a bid to increase response times when a crime occurs. The police analyze social media using text mining. Crime analysts used to spend two hours every day looking at the previous day's reports. A code skims all of the data from the previous night so it now takes 30 seconds. In addition, the Police now sends messages via Twitter or Facebook to people who have organized large parties telling them that the party is been monitored. In the U.S.A, most police departments are utilizing GPS technology as a part of their crime-prevention and crime-fighting strategies (White, 2014). With its ability to accurately locate individuals and vehicles, this technology is providing a range of new law enforcement solutions. PS-based law enforcement technologies can be used in the following ways: emergence response, patrol management, individual and vehicle tracking and gunshot detection.

In most developed countries, there is a central database that has details of all citizens and has links to other databases such as the car registration database held at the Drivers Vehicle Licensing Agency and to another powerful computer running the Automated Fingerprint Identification system. This integrated system helps in tracking down and controlling crime.

1.2 Statement of the Problem

Urban cities in Kenya pose challenges to the security and privacy of citizens due to the high populations and constrained infrastructure. The Kenya National Bureau Statics (2018) indicated that Kenya had recorded 1,000 more crimes since 2016, raising the number to 77,992 in 2017. The high rate of insecurity therefore requires robust measures strategies and equipment to tackle.

ICT and other advanced technologies in urban cities are becoming a powerful tool for responding to criminals, engaging in hotspots policing, solving violent crimes, monitoring employees' performance and many other functions. However, police and other security agencies often lack these modern technological equipment, resources, training, and personnel to respond to calls for security assistance or other emergencies. The study highlighted the roles played information communication and technology in enhancing security in urban areas in Kenya.

1.3 Objective of the Study

To establish the role of Information Communication and Technology in Enhancing Security in Urban Areas in Kenya: A Literature Based Review.

2.0 Literature Review

2.1 Theoretical background: Technology Acceptance Theory

Davis (1986) developed the Technology Acceptance Model that deals more specifically with the prediction of the acceptability of an information system. The purpose of this model is to predict the acceptability of a tool and to identify the modifications that must be brought to the system in order to make it acceptable to users. This model suggests that the acceptability of an information system is determined by two main factors: perceived usefulness and perceived ease of use. Perceived usefulness is defined as being the degree to which a person believes that the use of a system will improve his performance. Perceived ease of use refers to the degree to which a person believes that the use of a system will be effortless. Several factorial analyses demonstrated that perceived usefulness and perceived ease of use could be considered as two different dimensions.

Technology Acceptance Model postulates that the use of an information system is determined by the behavioral intention, but on the other hand, that the behavioral intention is determined by the person's attitude towards the use of the system and by his perception of its utility. According to Davis, the attitude of an individual is not the only factor that determines his use of a system, but is

also based on the impact that it may have on his performance (Fishbein & Ajzen, 1995). Therefore, even if an employee does not welcome an information system, the probability that he will use it is high if he perceives that the system will improve his performance at work. Besides, the Technology Acceptance Model hypothesizes a direct link between perceived usefulness and perceived ease of use. With two systems offering the same features, a user will find more useful the one that he finds easier to use.

According to Davis (1986), perceived ease of use also influences in a significant way the attitude of an individual through two main mechanisms: self-efficacy and instrumentality. Self-efficacy is a concept developed by Bandura (1982) which explains that the more a system is easy to use, the greater should be the user's sense of efficacy. Moreover, a tool that is easy to use will make the user feel that he has a control over what he is doing (Lepper on 1985). Efficacy is one of the main factors underlying intrinsic motivation and it is what illustrates here the direct link between perceived ease of use and attitude. Perceived ease of use can also contribute in an instrumental way in improving a person's performance. Because the user will have to deploy less effort with a tool that is easy to use, he will be able to spare efforts to accomplish other tasks. (Davis, on 1986).

2.2 Conceptual Framework

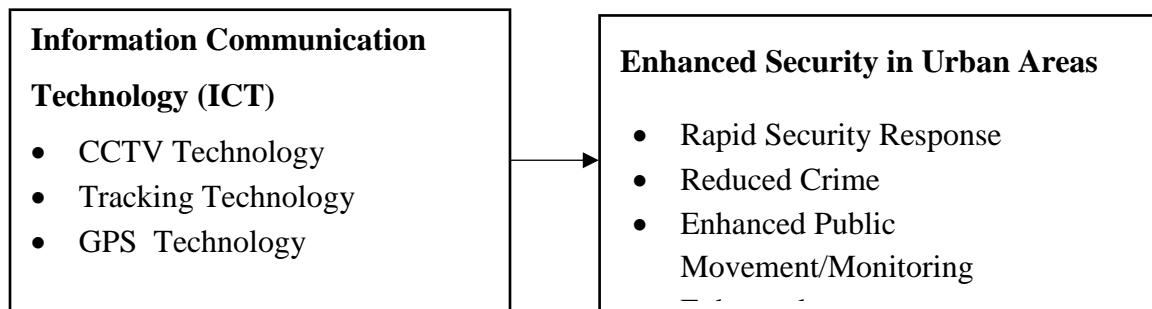


Figure 1: Conceptual Framework

2.3 Empirical literature

Kambuti (2013) conducted a study on the use of technology as a strategy by Kenya police in detection of crimes in Nairobi city. Primary data source was used in this study where data was obtained through interactive interviews. The nature of data collected was qualitative and was therefore analyzed using content analysis technique. Concerning the level of application of

technology, the study established that Kenya police force has not adopted latest technological advancements in crime prevention. Kenya police force hardly uses soft technologies that enable strategic use of information to prevent crime. The key finding was that Kenya police use personal mobile phones and walkie-talkies as the main Communication equipment in crime prevention. With reference to application of Technology in innovation, the study established that technology has not been used to improve efficiency in crime Detection by Kenya police force. However, the use of mobile phones has enables police officers to call for assistance whenever they come across crimes. The study recommended on structural reengineering of technological hardware and software at the Kenya police force. There is a need for the purchase of modern equipment that sends real time data on crime. The purchase of modern Equipment will enable effective crime prevention and crime management.

Gikonyo (2010) conducted a study on use of information systems in Nairobi. The study revealed that most municipalities had adopted traffic lights as the outermost solution to control vehicle traffic in urban areas. Efficiency of such systems was dependent on other factors such as power availability, traffic flow patterns and technology used. Unfortunately, most of these systems were static and lacked intelligence or decision making capabilities, creating very high levels of inefficiencies with huge losses. The study by Gikonyo (2010) concluded that these factors affected adoption and utilization of ICTs in traffic policing. Other omissions included the lack of integration of stakeholders, regulation frameworks and environmental factors as well.

Colvin and Goh (2015) emphasized the fact that the use of IT is an important factor affecting the performance of police work. In their study, it was proven that information quality and timeliness are two important components that are effective in terms of achieving the acceptance by patrol officers. They commented that the aim of technology as used in law enforcement is to facilitate and provide efficiency in policing. Technology has also shifted the perception of the police and changed the character of traditional policing. Using technology in law enforcement also represents a change in police management and organization. There was a positive relationship between police management and adaptation to the new technologies.

Likaka (2014) carried out a survey which concluded that the police needed new technologies or enhancement of communication while patrolling. The National Police Service has limited incorporation and engagements with ICT. Interviews from police officers in Langata police station

revealed. Police patrolling in the streets do not have airtime for work; a number of them are issued the VHF radio, which are rarely used. The introduction of digital records would be handy when compared to the current way of “pen and paper”, this would enable easy reporting of incidences and convenient storage and retrieval of crime related data thus fast triangulation and short period of investigations.

Kumar (2012) In India conducted a study on the role of information and communication technology in Indian police revealed that criminals were one-step ahead of the police in utilizing the most recent innovation including ICT. Indian police face a number of challenges as they perform their duties, the absence of coordinated data frameworks for the smooth working of the police, absence of capacity to import data to other related state level and national level organizations, and restricted capacity to analyze information because of different locations and analytical skills, among others.

Mubaraka, Jirgi and Nanyanzi (2013) in Uganda conducted a case study on integrating ICT in Traffic Police Department in Kampala. The study discovered that the proposed system provided a reliable source of information for serving customers in finding and retrieving traffic offences information. This system could provide means for the traffic police to handle various traffic cases by removing delays which were experienced through the old system as cross-checking through the traffic records is often time consuming. Since implementation, the traffic police has benefited from the new system because there are no longer delays in storing and retrieving traffic offences at the central police station in case related government departments need information.

3.0 Research Methodology

The study established the role of information communication and technology in enhancing security in urban areas in Kenya: A literature based review. The paper used a desk study review methodology where relevant empirical literature was reviewed to identify main themes. A critical review of empirical literature was conducted to establish the role of ICT enhancing security in urban areas in Kenya.

4.0 Results and Discussion of Findings

Result findings from literature-based review indicated that technology is critical in enhancing security in urban areas and in the country at large. In the absence of ICT products such as cameras,

detectors and alarms, security officers would be unable to identify threats and respond appropriately. Today's urban cities face a number of threats on a daily basis, it is essential to have a complete view of their operations and the local area at all times. There is need to programme their systems, so that it can detect unusual activity or behavior and notify the relevant operator. For instance, setting specific algorithms for CCTV cameras such as signaling an alarm if an individual is hanging around a certain area for too long or being able to analyze and identify unusual or unexpected car registration plates in car parks will all help detect threatening incidents before they even happen.

Technologically enabled collective action offers a viable near-term complement to traditional crime fighting efforts. ICT makes it easier for public groups and NGOs to organize responses to crime and even to highlight and thereby decrease instances of security officers' incompetence and corruption. Higher levels of transparency and accountability can be achieved by mobile phones linked together in common cause by FrontlineSMS or RapidSMS, with much the same effect as a vast array of closed-circuit television cameras.

Information and communication enabled collective action serves to steer government institutions on a path to greater efficiency and accountability in enhancing urban security. In some cases, it is through naming and shaming, as when a website publicly documents police soliciting bribes. In other instances, ICTs offer a means of measuring the severity of a condition, whether it is crime in urban cities.

5.0 Conclusions

The study concluded that several methods could be satisfactorily adopted for crime-based prevention and use of technology after identifying the spots. Places where there is high rate of crime, implementation of vigilance with CCTV, situational crime prevention methods and checking the geographical unit where crime rate is high and less.

Information and communications technologies can serve as dramatic force multipliers for Kenya's urban towns often overwhelmed and cash-strapped police forces. With high-fidelity imaging, police can familiarize themselves with large expanses of places, even the often-confusing layout of densely populated slums. Supplemented with simple data management software, police can begin to build vital crime maps to better concentrate their limited resources and personnel. Expanding access to mobile phones also means that police can stay in contact with individuals

more frequently, easily, and cheaply, thereby enhancing reporting and communication. Even simple ICTs provide surveillance, intelligence, and communication capabilities that broaden the range of police capabilities.

However, such applications of ICTs is that greater police accountability is needed to prevent these tools from becoming the source of more extortion or brutality by the police in urban areas. The adoption of ICTs, then, must be accompanied by strict regulations that require the police to be transparent with the information they collect for instance, by allowing Human Rights society organizations access to the locator logs in new police vehicles and/or to records from camera feeds. Data and reports should be shared publicly and frequently. Penalties and punishment for abuses must be clear and have an adequately deterrent effect. Fortunately, ICTs can empower new forms of public-police engagement and oversight by independent civil society groups to better ensure that they are used to improve police performance rather than to reinforce misbehavior.

6.0 Recommendations

The study recommends the implementation of an information-sharing platform between agencies to enhance security in urban areas. This platform would provide information to the various security agencies. Further information from the various security agencies should be interlinked to provide real time information that can be used to avert crime activities in the urban areas.

The study further recommends that the government should provide more funding, adequate training towards existing information technologies used in security department. There should be regular Information and communication technical training for security officers. Similarly, the police training colleges should also introduce a curriculum on ICT use in security policing while adequate funding would allow police department in urban areas to procure modern information technologies.

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