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## An e-Policing Model for the Ghana Police Service

### *Abstract*

*The proliferation of big data and data mining techniques in the world of business have yielded and continue to yield benefits across the globe as corporations have begun to realize its potential in boosting business growth, increasing competitive advantage, improving the efficiency of internal operations, optimizing productivity, providing better service and improving the quality of products. Therefore, data is today seen as an important commodity in giving any business its competitive edge. The same ideology has been discovered by police services in some countries as a means of improving policing and boosting police efficiency.*

*This study assesses the level of policing in Ghana and the use of information technology, big data and data analytics in fighting crime, crime prevention and improving policing tactics.*

*The concept of predictive policing and integration of big data and data mining in fighting crime is presented by proposing an e-policing model as a potentially impactful complement to the traditional policing methodologies of the Ghana Police Service (GPS).*

**Key words:** *Big Data, Data Mining, e-Policing, ICT4D, e-Government, Ghana.*

### 1. INTRODUCTION

The diffusion of Information Communication Technology (ICT) and its adoption into the public service sector has proved to be of great benefit to governments the world over. ICT is fuelling innovation in the modern-day public sector. According to De Vries et al. (2016), the forms of public sector innovation include process innovation, administrative process innovation, technological process innovation, product or service innovation, governance innovation and conceptual innovation which are focused on increasing effectiveness, increasing efficiency, tackling societal problems, increased citizen involvement (participation) and increasing customer satisfaction.

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In spite of the risks such as privacy and data security, the formation of new digital divides (digital elites), lack of control and unclear accountability, danger of data and content misuse (Millard, 2013) which go in tandem with the proliferation of technology and innovation in all areas of life especially the public sector and governance, ICT's benefits outweigh its shortcomings.

This study is aimed at exploring the gap in ICT incorporation into the Ghana Police Service and it gives recommendations on a comprehensive e-policing model. The study included a literary analysis of reports and scientific publications on e-Policing, ICT adoption in public services and the Ghana Police Service. Also, Ghana's Criminal Justice indicator data (a subset of the Rule of Law Index) from 2012 to 2016 was collected from the World Justice Project reports (Agrast et al., 2013; World Justice Project, 2014, 2015, 2016). The following sub-categories are an aggregation of the criminal justice indicator: criminal investigation system is effective, criminal adjudication system is timely and effective, correctional system is effective in reducing criminal behavior, criminal justice system is impartial, criminal justice system is free of corruption, criminal justice system is free of improper government influence, and there is due process of law and rights of the accused.

## **2. THE GHANA POLICE SERVICE**

Established in 1894, the Ghana Police Service (GPS) has undergone transformation from British colonial rule eras until present day Ghana (Tankebe, 2008a). It is a subsection of the Ministry of Interior and it falls under the judicial arm of the government. Figure 1 below illustrates the organisational structure of the police service. According to the Ghanaian Times (2014), the ratio of police to population in Ghana was 1: 1,000 in 2010, 1: 847 in 2012 and 1: 500, indicating a reduction in the burden on the police service.

Whereas the developed world has taken giant leaps in exploiting ICT in their security services (Gupta et al., 2008), there is a significant gap in the deployment of ICT in the Ghana Police Service. Moreover, the measures incorporated in appointing police officers are archaic – based on the physical structure. It was revealed in a study by Gyamfi (2013) that the height in the majority of service men does not play an important role in their performance thus the height criteria should be discarded, police personnel should be encouraged to further their education, logistics should be enhanced and police personnel should be motivated to perform better.



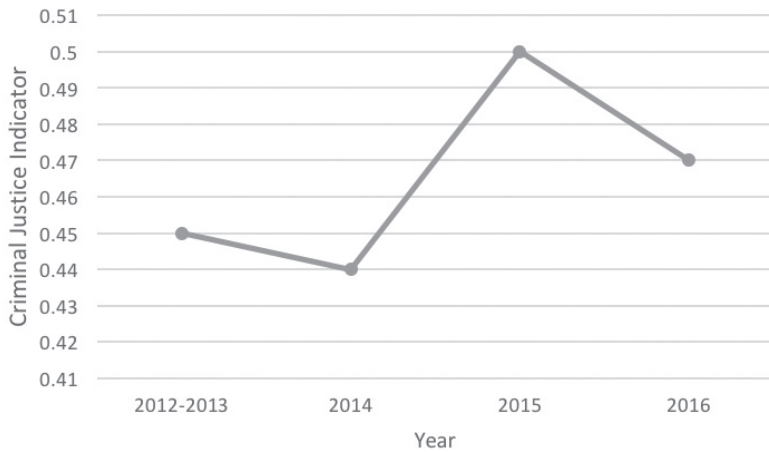


Figure 2: Criminal Justice Indicator records between 2012. and 2016.

Figure 2 illustrates the deficiency in criminal justice what indicates that despite the fact that the GPS is improving in moving towards the United Nations' benchmark (Graphic, 2017), there is still room for improvement and this is where e-Policing comes into the picture.

### 3. AN OVERVIEW OF E-POLICING

Electronic Policing (e-Policing) as defined by Boondao and Tripathi (2007) is the use of Information Communication Technology (ICT) in police work to improve effectiveness and efficiency, support front-line officers and assist in local problem-solving initiatives to reduce crime and reassure the public. It intends to provide total computerized information system support for the work of the police (Mojsoska et al., 2016). E-policing is known as Smart Policing in certain contexts (Matlala, 2016) and is broadly defined as a combination of intelligent implementation of innovations in policing technology while implementing the existing policing strategies such as Intelligence-led Policing, Hotspot Policing, Problem-oriented Policing, Community Policing as well as Sector Policing effectively and efficiently.

Estonia is an example of a country with an e-policing model created by Estonia's IT and Development Centre of the Ministry of the Interior (SMIT). It consists of a rugged portable weatherproof tablet computer which hosts a specially designed web-based (cloud-based; hence no sensitive information is stored on the device) modular software solution that can be used by officers to access all the information they need. It is connected to multiple key databases through a secure data exchange channel (known as X-Road) and, on the spot, it provides police officers with all the necessary information at their fingertips<sup>2</sup>. The solution has gone beyond Estonia's boundaries as a result of its cross-border integration with Finland's databases.

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<sup>2</sup> e-Estonia (2017). The New Estonian e-Police System is a Sight to Behold. Available at <https://e-estonia.com/the-new-estonian-e-police-system-is-a-sight-to-behold/>

E-Policing can be classified as an e-Government initiative. Ghana's e-Government is still at a young phase which is gradually taking strides due to the government's commitment to the adoption of e-government as a tool not only to transform government's business processes but to provide efficient public service delivery to all its citizens (Mensah, 2015) and residents.

### **3.1. Innovative ICT Initiatives by the Ghana Police Service**

During the 2012 national elections, a Social Media Tracking Center embedded at the Ghana Police headquarters was able to bring about swift action and resolution in response to an incident of unrest at a polling station (Smyth et al., 2012).

Ghana's Emergency Command Center was launched in 2016 to monitor areas in Accra and facilitate early detection and response to any incident during the elections. It is equipped with intelligent cameras to monitor places of interests that are based on different defined threats. The facility uses mobile technology, video and other medium to ensure that information is transferred on time to the Command Centre for swift action<sup>3</sup>.

Presently, the e-Services portal of the Government of Ghana (GOG) has initiated a system for citizens to access services provided by the GPS which handles the application of police reports and DNA tests with the Criminal Investigation Department (CID)<sup>4</sup>.

In addition to the above mentioned ICT initiatives, introducing a comprehensive and efficient e-Policing will further lessen the burden on the police as well as improve their crime fighting strategies. The next section discusses the need for such a model in the GPS.

## **4. THE NEED FOR AN E-POLICING MODEL IN THE GHANA POLICE SERVICE**

GNA (2017) highlighted that it has been the goal of the GPS since the launch of their five year Strategic National Policing Plan to attain a level of computerization that would streamline all its activities with particular reference to information management, IT infrastructure and communication requirements of the Service. Thus, it indicated an absence of the essential technological innovation and expertise to expedite policing tactics and modernize their modus operandi. Just as research by Mojsoska et al. (2016) called attention to numerous preconditions for Macedonia to have an e-policing system such as eliminating bureaucratic processes in criminal case registration and the existence of quality management information systems (MIS) for top-level policy formulation and decision making, the same can be said of Ghana. Inferring from the Criminal Justice indicator of the World Justice Project's (WJP) Rule of Law index in figure 2, the clearly visible below average performance is the reason why e-Policing must be adopted.

The following points are motivating factors for adopting an e-Policing model in Ghana:

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<sup>3</sup> Ansah M. (2016). Ghana's 1st National Emergency Centre Opens in Accra, [citifmonline.com](http://citifmonline.com) Available at <http://citifmonline.com/2016/02/03/ghanas-1st-national-emergency-centre-opens-in-accra/>

<sup>4</sup> E-Services Portal of the Government of Ghana (<http://www.eservices.gov.gh/GPS/SitePages/GPS-Home.aspx>)

- a. Increased cybercrime and internet fraud activities: A study by Boateng et al. (2010) on the increase in cybercrime in Ghana indicated that perpetrators are young and highlighted that although awareness of cyber crimes is on the increase, these crimes mostly go unreported and agencies responsible for investigating, controlling and apprehending online criminals lack the technical knowledge needed to tackle the problem.
- b. Increase in mobile accessibility and internet connectivity: An increase from 2.7% to 34.7% between 2006 to 2016<sup>5</sup> and over 4 million Facebook subscriptions<sup>6</sup>.
- c. A rising number of vehicular accidents: Ghana ranks 38th worst country in world traffic accidents ratings per 100,000 at 24.60, while globally road traffic accidents stand as the 9th cause of death with a total of 1,254,526<sup>7</sup>.

#### 4.1. Proposed GPS e-Policing Model

In order to support the GPS in improving its policing tactics, an e-Policing model which incorporates both internally generated data from various security departments, criminal databases and information from government agencies as well as external data such as open data, social media, company data (3rd party) must be the major source of data. Applying various machine learning and data analytics techniques to these data will yield desired results what will support the traditional policing strategies.

Figure 3 below illustrates the proposed model.

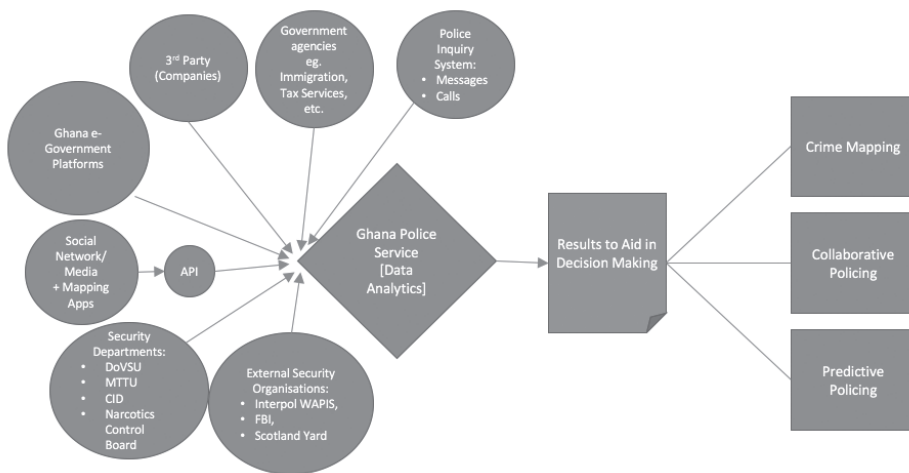


Figure 3: Proposed e-Policing model for the Ghana Police Service

<sup>5</sup> The World Bank, World Development Indicators (2016). Individuals using the Internet (% of population) [Data file]. Retrieved from <http://data.worldbank.org/indicator/IT.NET.USER.ZS>

<sup>6</sup> World Internet Stats (2016). Available at <http://www.internetworldstats.com/stats1.htm>

<sup>7</sup> 3 News (2017), Ghana to Introduce Dedicated Traffic Cameras by June Available at: <http://3news.com/ghana-to-introduce-dedicated-traffic-cameras-by-june/>

## 4.2. Challenges to an e-Policing system in Ghana

Every system faces obstacles during its inception and before its introduction. The proposed model is not an exception and the hindrances to an e-Policing model in Ghana include:

- a. Lack of adequate infrastructure;
- b. Traffic cameras;
- c. High-end devices;
- d. Non-existent Information System;
- e. Expensive Internet connectivity tariffs;
- f. Low police service e-literacy rate;
- g. Non-comprehensive mapping due to poor town and city planning;
- h. Resistance to change;
- i. National budget constraints and prioritization (though there has been an increment in national budget allocation, little focus on security is evident in figure 4);
- j. Unreliable electricity supply;
- k. Poor maintenance culture.

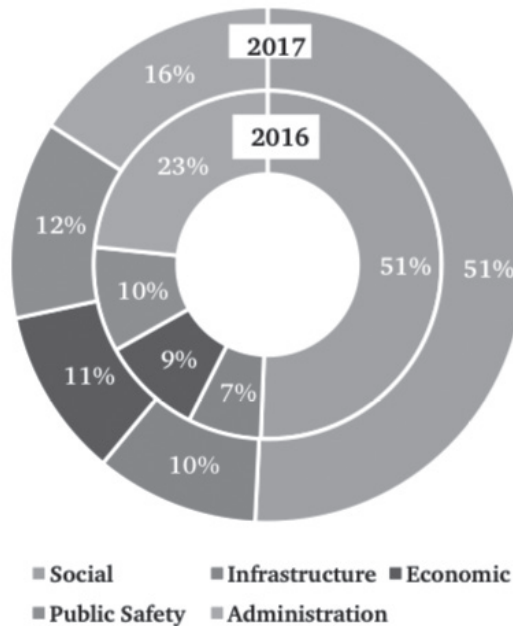


Figure 4: Sector allocation of Ghana's budget for 2016 and 2017<sup>8</sup>

<sup>8</sup> PwC Ghana, (2017), 2017 Budget Highlights "Sowing the Seeds for Growth and Jobs".

### **4.3. Benefits of the e-Policing Model**

The benefits of such a system are immense, more specifically in the long run. The following are some benefits to the Ghanaian ecosystem:

- a. Hunting down on crime and drug networks;
- b. Reducing domestic violence and child abuse and educating on women's rights;
- c. Partnering with the private sector in fighting crime (e.g. fraud);
- d. Tracking down stolen vehicles;
- e. Improved police accountability;
- f. Aiding the Ministry of Interior's decision making process on resource allocation;
- g. Providing international crime fighting agencies with relevant information;
- h. Providing reliable information to public sector and government agencies prior to employing individuals (i.e. criminal background checks).

## **5. CONCLUSION**

### **5.1. Conclusions**

An efficient electronic policing strategy will cut down on numerous crimes and ease the burden for security services in Ghana. As pointed out by Quarshie (2014), the fight against crime in Africa demands a cohesive and coordinated approach supported by strong ICT security systems, a legal framework for cyber-security to come into full force as well as highly skilled professionals to manage and support security services.

E-Policing is the way out in the growing number of modern day criminal activities thus the Ghana Police Service must be fully equipped to deal with the present day evil and what is ahead in the near future.

### **5.2. Recommendations and Future Work**

Until today, there has been an absence of trust in the police service in Ghana and this can be attributed to the lack of respect for their mode of operation amidst other factors. To curb this, it is necessary for the post-colonial Sub-Saharan African governments to take the initiative and reform their police services in order to win over the public trust in the police because this trust is indispensable for their effectiveness (Tankebe, 2008b).

As outlined by Mojsoska et al. (2016) when developing an e-Policing initiative, the following are essential: development of a strategic vision and direction, evaluating impacts of related legislation, evaluation of technology options, projection of all costs, including planning, implementation and operation, and identifying such barriers to success as lack of strategy, resistance and delays in requirements.

Regarding practice and policy implications, learning from experienced nations, partne-



ring with educational institutions and moving from theory to practice should be in the focus of the Government of Ghana in order to raise the security service's efficiency to an optimal level.

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