

Chapter 8

Towards the Design of a Geographical Information System for Tracking Terrorist Attacks Online in Nigeria

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ABSTRACT

Currently in Nigeria, different crimes ranging from ethnic clashes, domestic violence, burglary, financial fraud, kidnapping, pipe-line vandalism, and random killings by terrorist organizations, to mention a few, continue to plague the country. The conventional system of intelligence and crime record have failed to live up to the expectations as a result of limited security personnel, deficiency in effective information technology strategies, and infrastructures for gathering, storing, and analyzing data for accurate prediction, decision support, and prevention of crimes. There is presently no information system in Nigeria that provides a central database that is capable of storing the spatial distribution of various acts of terrorism based on the location where the crime is committed. This chapter presents the design of an information system that can be used by security agents for the storage and retrieval of criminal acts of terrorism in order to provide improved decision support regarding solving and preventing criminal acts of terrorism in Nigeria using modern technologies.

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1. INTRODUCTION

Crime is as old as man himself and efforts have been directed for ways to combat and reduce it. Criminal activities such as robbery, assaults, theft, internet fraud, alteration of documents, impersonation, advance fee fraud, homicides, kidnapping amongst others are everyday occurrence in all parts of the world (Ejemeyovwi, 2015). According to World Population Review (2020), Venezuela has the highest crime rate worldwide with crime index of 84.86 percent while in the United States, it is 46.73 percent. Also, the prevalence of crime in South Africa and Nigeria is still relatively very high (Nwankwo & James, 2016). The alarming increase in rate of criminal activities in Nigeria is reported in local and international media (print and electronic) in reflection of the index for measured status. This is aggravated by the harsh economy coupled with the rush for quick wealth especially among the youths. Idhoko and Ojaiko (2013), described Geographic Information Systems (GIS) as a computer system capable of capturing, storing, analyzing, and displaying geographically referenced information which works by relating information from different sources.

A geographic information system (GIS) can be described as a location-based information system modeling the real world. Wang (2012), gave an in-depth review on the numerous benefits of using GIS applications by security personnel which include the fact that GIS can be used as tool for preventing, monitoring and investigating crimes. It can also be used for mapping how various geographical locations of different crimes relate to one another. The power of a GIS comes from the ability to relate different information in a spatial context and to reach a conclusion about this relationship. Since the emergence of the Internet in the 1990s, there has been a paradigm shift in all aspects of GIS. The way GIS applications are designed have metamorphosed from an isolated architecture to an interoperable framework; from a standalone solution to a distributed approach; from individual proprietary data formats to open specification exchange of data; and from a desktop platform to an Internet environment (Chow, 2008).

Current technological advancements have increased the awareness of GIS's potential among the general public and also encouraged researchers and other stakeholders to explore more powerful GIS techniques (Smiatek, 2005). The recent development of web services, 3-dimensioanl (3D) visualization tools (e.g., Google Earth, World Wind) and Maps Application Programming Interfaces (APIs) have certainly contributed to the ever-increasing attention to the development and implementation of distributed GIS through the Internet (Butler, 2006). In emergency situations and highly critical missions, information about the location of incident suspect or victim in crime is often crucial to determination of the manner and size of the response by law enforcement agencies.

Most of the information available about terrorism today is location-based and can be referenced to a spatial location. Spatial data play a very important role in the fight against insurgency and terrorism. Terrorists' uprising in Nigeria which started in 2009 as a small riot has now metamorphosed into a global threat and this has drastically increased the rate of insecurity in the country (Adelaja, Labo & Penar, 2018). Nigeria is currently being faced with different acts of terror which include ethnic clashes, kidnapping, pipe-line vandalism and random killings by some herdsmen to mention a few. For crime to occur, there are offenders, their target (victims) and properties which are usually located at a point in any given period of time. The conventional system of intelligence and crime record may fail to live up to expectations of the existing crime scenario as they have been found to be deficient in terms accuracy, reliability and comprehensive data availability required for prediction and decision support for enhanced productivity and effective utilization of materials and manpower (Adigun, Folorunso & Uzoh, 2018).

1.1 Problem Statement

The problem of crime in Nigeria is multifaceted and it ranges from cybercrimes, corruption, money laundering, kidnapping, terrorism, robbery, bribery, cultism, rape, and fraud amongst others (Oguntade, Ojo, Okagbue, & Oguntade, 2015). The commonest and most heinous amongst these crime types include kidnapping, terrorism and robbery as a result of high rate of poverty, social, economic and political instability in the country. The crime index of Nigeria currently stands at 64.64 according to World Population Review (2020). There is a need for reliable emergency communication at national level. There is presently no information system in Nigeria that provides a central database that is capable of storing the spatial distribution of various acts of terrors based on the location where the crime was committed. Hence the focus of this work is to develop a spatially enabled information system that can be used by security agencies for the storage and retrieval of criminal acts of terror in order to improve the ways some of these crimes are solved in Nigeria.

2. LITERATURE REVIEW

Crime is one of the major challenges that most governments around the world are currently plagued with (Bornman, 2012) and it affects quality of life negatively (Chaudhuri, Chowdhury & Kumbhakar, 2015). Crime could be in the form of cyber-crime, robberies, burglaries, vandalism, sexual harassment, murder, kidnapping, terrorism amongst others. In Malaysia, using a ten-year period of 2004 to 2013 archival analysis showed that a total number of 314,675 violent crime incidents