

Data-Based Technology, Criminalistics and Forensic Intelligence in Nigeria Policing: A Criminological Analysis

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Abstract

This study raises awareness regarding the relevance and challenges of using data-based technology to establish forensic intelligence and sustain facts in issues of the criminal justice system and crime control in Nigeria. Related and relevant literature was reviewed. Data were collected from both primary and secondary sources. Quantitative and qualitative methods of research were employed in the study with the aid of a questionnaire and Key Informant Interview (KII). The study involved 575 police officers and men in Ondo state command, Nigeria who have the required information at their disposal on the subject matter. Purposive, random, as well as, systematic sampling techniques were employed in the study. The study reveals that the majority of the police officers are below the age of 40 years, male, single/married, Christians, attended tertiary institutions and had served between 1 to 19 years in police service. The majority of the police officers are aware of the relevance of data-based technology and there are a lot of benefits and several challenges in the use of data-based technology for crime control. The study, therefore, recommended that the Nigeria government should provide adequate funds, equipment, facilities, education, training and re-training of the police officers; control corruption among the Nigeria police; encourage bio-metric data collection; provide political-will and legal framework; provide adequate power supply and effective Interpol among the Nigeria police and foreign police officers.

Keywords: Control, Criminalistics, Data-based Technology, Forensic Intelligence, Nigeria.

Introduction

The modes and patterns of crime commission have changed from traditional to modern. Criminality has been so dynamic and complex. It has developed and advanced in the whole world. Thereby, the system of controlling crime also needs to be advanced. The strategy of crime control needs to also be advanced,

dynamic and complex. The crime rate is on the increase and this calls for attention. Advanced crime control requires technicalities with advanced technology. In our contemporary society, security personnel need technology to boost their work.

Technology has to do with the application of science in solving problems. The knowledge and utilization of technology increase efficiency and effectiveness in crime control with speed and ease, if applied in the right direction; particularly to investigate and track down those who committed a crime and fraudulent activities in Nigeria and beyond. Technology offers new opportunities to crime investigators and crime perpetrators (Edori, 2018). The sole responsibility of the police in Nigeria is “crime control”. It is high time in Nigeria to devise intensive modelling programmes that create a desirable synergy among forensic science, crime analysis, crime investigation and other related fields. In the criminal investigation and crime control, the ultimate contribution of criminalistics (forensic criminologist) is to links a suspect to a crime through comparative analyses.

Acquired forensic evidence like fingerprints, hairs, fibres, paints, blood, semen, DNA and so on without the ability to link these items to a real suspect will be of no value. In the 21st Century, crime laboratory is at the forefront of crime investigation seeking to identify the real crime perpetrators. This can be achieved effectively through the creation of computerized database technology to keep the identification of people in the community for forensic investigations whenever a crime is being committed. Criminalistics data-based technology ensures crime pattern analysis, profile analysis, case analysis (cause of the crime before, during and after an offence), comparative case analysis and so on.

Data-based technology has been used to control crimes in several developed and developing countries of the World (i.e. China, United Kingdom, United State of America, England, Netherland, Austria, Germany, Belgium, Denmark, Finland, France, Norway, Spain, Sweden, Italy, Switzerland, Ireland, Greece, Portugal, South Africa, India and so on. China has the largest offender database in the World with nearly 25 million samples (Joy, Bastian, Selvamani and Abraham, 2018). Computers have been a very useful tool in crime detection for decades now. Criminalistics data-based technology has become central to the process of a criminal investigation. It has been successful in the advanced countries as a result of the political will of the country, the technical capability of the forensic science service and the operational desire of the police of the countries (Aspen, 2004).

In this 21st century, the patterns and methods of committing a crime in Nigeria have evolved from analogue to digital, and this makes crime investigation and prosecution becoming complex and dynamic in nature. Therefore, crime investigation has to go beyond the issue of physical evidence that can be seen with the naked eyes alone, but forensically. Several offenders perpetrated grave crime and scot-free because there is no substantial forensic crime investigation and evidence that can be established by the criminalistics. Even, if the crime scene investigators can establish evidence against a suspect, there is no data-based technology to substantiate the facts in the evidential issues in the court of law. Data-based technology helps to compare the standards and evidence at hand to know the fact therein.

Crime control in Nigeria has always involved a manual system of documentation. There have been several problems encountered in this manual system of crime investigation in Nigeria. There are challenges in treating case files due to red-tapism and cumbersomeness, inaccuracy, delay in accessing the information in paper files, the vulnerability of the documents to damage, missing of criminal records, the tediousness of the manual searching for crime case files since they are not usually arranged chronologically or logically, alteration by an unauthorized user and so on.

All these factors lead to poor prosecution of criminal cases in Nigeria. For decades in Nigeria, the crime rate has been on the increase and there have been difficulties and misappropriation of justice in the criminal justice system. Due to the varieties of challenges of the manual method of crime investigation in Nigeria, there is the need for an alternate. Data-based technology and criminalistics ensure that all the relevant facts gathered from the crime scene are analyzed by placing them side by side with all the testimonies and physical evidence(s) gathered along with all observations discovered while examining the crime scene.

Criminalistics data-based technology is a front-line security measure for identity verification and crime detection, and also offers effective crime deterrence. Database technology embraces a range of technologies such as biometric that include: fingerprinting, hand-writing recognition, DNA analysis, blood sample recognition for identity verification using physical data and behavioural patterns (Gautam and Sharma, 2011; Falaye, Adama and Agemerien, 2013).

This digital data is encoded and can be stored and searched for on-demand via a computer. The basic biometric data that should be included in Nigeria database technology are Name, Age, Gender, Marital status, Educational status, Local Government Area and State of origin, Religion affiliation, Employment status,

Contact address, Phone number(s), Email address, Type of occupation, Legal status (convict or not), Photograph/passport, Blood group, Genotype, Eye colour, Hair colour, Fingerprints, Footprints, Height and weight, Tribal marks and race, and other physical measurable appearances. Apart from crime control, these biometric data could also be used for gathering information on Bank verification number, social media networking, intelligent gathering, population census purposes, online voting information, tracking purposes, migration information system, security matters, planning and policy formulation, national identification of citizens, among others.

There is the need to adopt the use of technology-based equipment with the support of data-based technology, to prevent, reduce, analyze, and most importantly control criminal activities. The advancement in technology improves the effectiveness and efficiency of the police and accountability are increased and may also enhance police legitimacy (Smith, 2004; Ayinde and Agwu, 2016). Criminalistic data-based technology could play vital roles in Nigeria in the area of crime investigation like forensic accounting, sexual offences, cybercrime, bloodstain test, fingerprint examination, DNA confirmation, and so on. Ribaux, Walsh and Margot (2006) added that criminal intelligence needs to be broadly implemented within the law enforcement organizations and through technologies, such as Database, Geographical Information System (GIS), Data mining strategies, Geographical Positioning System (GPS), Crime mapping, Biometric security devices, and so on. It involves the reconstruction of such events by evaluation of the physical evidence and the crime scene, to reveal the forensic intelligence information therein.

Forensic science refers to the application of scientific knowledge to legal problems or proceedings. In the legal milieu, forensic science is largely concerned with the testing of physical and non-physical evidence to determine objective facts about what happened, when it happened, who was involved, and how it happened. Therefore, forensic science's capability is important in endeavor stics examination because it yields information that is more accurate, precise and reliable than eye-witness testimony or even confessional statement from the suspect. According to Inman and Rudin (2001), the practice of forensic science is based on four basic inferences, or processes: identification, individualization, association and reconstruction. It helps in various degrees to answer investigative questions of "Who, What, Where, Why, and How?"

Forensic intelligence, therefore, refers to a process that commences from the collection of data at the crime scene; and the exploration of these data relies

completely on the quality and quantity of the data collected from the crime scene. Therefore, the inferences drawn and actions were taken at the crime scene are fundamental to forensic intelligence, because these will entirely determine the nature of the data that would be collected and thereafter explored to arrive at forensic intelligence gathering. Succinctly, the forensic intelligence process begins with the collection of data and lasts to the level of integration of results into the analysis of the evidence of crimes under investigation.

According to Ribaux, Girod, Walsh, Margot, Mizrahi and Clivaz (2003), forensic intelligence is the accurate, timely and useful product of logically processing (analysis of) forensic case data (information) for investigation and/or intelligence purposes. The outcomes of forensic analysis become the source of intelligence. Thus, forensic intelligence points to how the collection, collation, interpretation and dissemination of forensic data can support investigation and broader intelligence programmes (Ribaux, Walsh and Margot, 2006).

It is evidential and presumably that the uses of data-based technology and criminalistics' principles are relevant to crime control. It is a veritable tool to solve the crime by matching samples from convicted felons, used to expose the possible suspects and also to prove the innocence of convicted felons. The national database can link details on close relatives and therefore links crime to family members of the suspects and so on. Some of these pieces of evidence could be examined in the laboratory to get a more in-depth and factual analysis of the evidence, such as fingerprint, DNA, and so on which could aid the identification of the suspect/criminal. The implementation of the automated data-based technology system will ensure that crimes are well investigated, prosecuted and criminal records are well managed for an effective and efficient criminal justice system in Nigeria.

Database technology and criminalistics have not to be employed adequately in Nigeria to control crime due to several factors ranging from legality, admissibility of such evidence, technological know-how, socio-cultural factors, corruption, privacy and protection of information, logistics, cultural diversities and many more. The problem, therefore, lies in the poor crime control in Nigeria. Hence, the study presents the relevancies and challenges of the application of data-based technology and criminalistics to crime control in Nigeria.

Aim and Objectives

This study aims to analyse data-based technology, criminalistics and forensic intelligence in Nigeria policing. The specific objectives are to:

1. Identify the relevance of data-based technology and criminalistics in crime control in Nigeria.
2. Examine the challenges to the use of data-based technology and criminalistics among Nigerian police.

Methodology

The research design is descriptive and explanatory in nature. This study adopted both quantitative and qualitative methods of research. The study employed survey research and it used questionnaires and Key Informant Interviews (KII) respectively to elicit information from the police personnel in Ondo state command, Nigeria. The study sourced first-hand information from the field. 575 respondents (553 for questionnaires and 22 high ranked police personnel for the Key Informant Interviews) were purposively, randomly and systematically selected among the Police Officers and men in Ondo State Police Command, Nigeria. Qualitative data were collected from 22 top-ranked Police Personnel (2 at State Headquarters, 4 Area Commands and 16 Police Divisions) in Ondo State Police Command from the rank of Assistant Superintendent of Police (ASP) to Assistant Commissioner of Police (ACP). Quantitative data were collected across the 51 Police Divisions in Ondo State Police Command. The duration of the survey was within 10 weeks (May 4th – July 10th 2020) with the aid of research assistants.

Descriptive statistics were employed to summarize and interpret the data. The quantitative data analysis was presented with frequency and percentage tables. A qualitative method of data analysis was employed to analyze and present the qualitative data with the aid of the content analysis technique. Both the quantitative and qualitative methods of data analysis were used as complement and support to each other.

Findings

The data collected from the field were analyzed, interpreted and presented. Table 1 reveals that most of the police officers were between the ages of 20 – 49 years old as 90.8% of the respondents were in the age bracket. The implication is that majority of the police officers were employed to the police early and they are young and agile as productive ages in Nigeria. Furthermore, the sex distribution revealed that male respondents in the study constituted 67.1% of the total respondents; while the female constituted 32.9%. This could be adduced to the nature of the profession. Also, the study discovered that 42.0% of the police officers are still single and 58.0% were married. None of them claimed to be divorced, widow, widower or separated in their marital status. The majority of the police officers in Ondo state are Christians. This was

revealed in this study as only 21.9% of the respondents were Muslim and 78.1% were Christians, and none of them practices traditional religion. The reason for this could be due to the geographical location of the study area in Nigeria (South – West) that is Christian dominated.

Also, the level of education among the police officers in Ondo state revealed that 0.2% of the respondents had only primary education. 18.3%, 50.8% and 30.7% of the police officers had secondary, tertiary education (1st degree; HND, ND and/or NCE) and post-graduate education respectively. Therefore, none of them without formal education. About half of them (49.9%) had less than 10 years of working experience in service; while the other half had been in service for over 10 years by now. This was revealed as 50.1% of the respondents have been in service between 10 – 34 years. This indicated that they have better experience in policing in Nigeria.

The study also reveals that 93.3% of the total police officers in the study are well aware of the relevance of data-based technology in crime control in Nigeria. The implication is that a greater proportion of Nigerian police officers are aware of the usefulness of database technology in crime control in Nigeria.

Furthermore in this study, to establish deeper knowledge on Data-based Technology, Criminalistics and Forensic Intelligence in Nigeria Policing some top police officers were interviewed. One of them revealed on the *awareness* of data-based technology for crime control that:

I am aware of data-based technology in crime control. It is one of the best ways of collating information technologically. Data based technology helps us to get information in every endeavor of humanity (KII, a top police officer at Fanibi Division, Akure, 15th June 2020).

Another top police officer at Ikare revealed on the awareness of data-based technology in crime control that:

Yes! I am very much aware of data-based technology. It has to do with everything that involves the use of a computer to store data and retrieve it at the point of need. It is being used for tracking offenders or phones via a computer system and this gives more effectiveness (KII, a top police officer at Ikare – Akoko Division, 18th June 2020).

In a related vein, another senior police officer in Ondo State revealed further in an interview session as follow:

I am aware of data-based technology for crime control because it is one of the modern ways of getting information from the computer and it enhances the proper process and

accurate investigation of crime in the Nigeria police (KII, a top police officer at Ore Division, 24th June 2020).

Another senior police officer made a distinct point known here that:

The majority of the officers that were enlisted into the Nigeria police in the '80s and '90s or before then were with only secondary school certificate. Some of the police officers do not know that such a thing exists at all. (KII, a senior police officer at Oba-Ile Division, 17th June 2020).

Table 2 reveals that at least 71.6% to 98.0% agreed that data-based technology is useful for crime control by the Nigeria Police particularly in the area of crime detection and investigation, effective communication, accurate and reliable crime investigation, genuine information and intelligence gathering, quality crime analysis, improvement of surveillance and security, factual evidence, acquisition of digital data for crime analyze, police legitimacy, quick and ease the apprehension of offenders, police accountability and accuracy, avoidance of inconsistent information, crime reduction due to deterrence, ease and fast searching for data in the archive, and so on. Thus, the table shows that the majority of the respondents were in support of the enlisted benefits of data-based technology to crime control in Nigeria.

In the Key Informant Interview sessions, a top police officer at Owo reiterated the *usefulness* of data-based technology in crime control that:

Data-based technology is so useful to control crimes like kidnapping, Banditry, Rape, Robbery, Terrorism and so on. Data-based technology could help the crime investigating officers to analyze any suspect(s) arrested. This will help the investigator of the criminal department to quickly know how the suspect(s) could be arrested and their modus operandi (KII, a top Police Officer at A – Division, Owo, 26th June 2020).

In addition, another top police officer at Idanre reveals that:

Data-based technology is useful in crime control in the areas of criminal investigation because policing is all about investigation and there are a lot of things embedded in it, such as; detection, arrest, fact-finding and so on (KII, a Senior Police Officer at Idanre Division, 16th June 2020).

Another top-ranked police officer stated that:

It gives more accurate results of the investigation. There would be efficiency and effectiveness of the police officers. The use of email and the internet with a computer is an instant response than waiting for a signal sent from Abuja force headquarters. The feedback is faster and easy, rather than using the police wireless message which

can take 48 hours or more before information can get to your table (KII, a Senior Police Officer at Ofosu Division, 25th June 2020).

Further investigation conducted in the interview session with another senior police officer at Criminal Investigation Department at Police Headquarters Akure unfolded the foregoing that:

Data-based technology makes the crime investigation stress free and discovers the nature of the crime that is prone to a particular area than the other. For examples, recording of crime cases reveals the area where raping, bunkering and so on are common (KII, a Senior Police Officer at CID, Police Headquarters, Akure, 17th June 2020).

In the same direction, another top police officer revealed that:

Anything related to the computer system will enhance the operation of the Nigerian police. The advantage of it is that it will help the Nigerian police to get criminals or to have the records of criminals; and those that have committed a crime. Data-based technology serves as a better way of getting the criminals (KII, a top Police Officer at Ala Division, 17th June 2020).

Further investigation conducted in Key Informant Interview (IDI) session with a senior police officer in the computer unit in the Ondo State police headquarters, Akure unfolded thus:

Data-based technology aids the tracing of criminal records and to get accurate records of people who have committed an offence such as serial offenders and recidivists (KII, a Senior Police Officer at Oba-Akoko, 3rd July 2020).

Further information via the Key Informant Interviews (KII) with some police officers in Ondo State revealed the followings on the *functionality* of data-based technology for crime control in Nigeria. One of the police officers revealed that:

There are criminalistics data-based technologies, but not functional. We have the criminalistics data-based technology and it is at the Force Criminal Investigation Department (FCID), Abuja at the federal level. Every state is expected to collate the information of people that were suspected, prosecuted, convicted and those that were discharged. At the end of it all, it will get to the Criminal Intelligent Bureau (CIB) at Abuja (KII, a Senior Police Officer at Area Command, Akure, 26th June 2020).

In another interview session, one of the top female police officers said further that:

Data-based technology is functioning at the federal and state level, but in Nigeria, even if there is information at the state level to the federal government, there is usually no feedback to know the result of the case either the person was eventually

convicted or not (KII, a Senior Female Police Officer at Ile-Oluji Division, 18th June 2020).

Table 3 reveals that the majority of the police officers in the study claimed that the major factors adversely affecting the use of database technology in Nigeria include: Lack of funds to procure equipment and facilities (96.9%); Epileptic power supply (89.2%); High level of corruption and human manipulation of data (89.0%); Lack of forensic skills by the police officers (88.2%); Poor culture of a recording system in Nigeria (87.9%); Lack of fund to train the police personnel in forensic intelligence (86.6%); Lack of political and legal-will for the implementation of the policy (86.4%); Lack of technological know-how among the police officers (85.58%); Lack of cyber-security against hackers and fraudster (84.8%); Low morale of the police officers (motivation) (84.3%); Lack of security, privacy and protection of stored data (83.5%); Non-awareness of the usefulness of data-based technology in crime control constitutes (80.3%) among others.

In the same vein, Key Informant Interviews (KII) with some police officers in Ondo State explained additional *challenges* on data-based technology for crime control in Nigeria. One of them at Irele police division reveals that:

It is not that the Nigerian police do not have the manpower that can carry guns and do administrative duties, but the officers are not technologically oriented. The officers in the field are more than the officers in the office doing the administrative works. These are only paper works and not computer oriented. Nigeria police still work manually and not electronically (KII, a Senior Police Officer at Irele Division, 22nd June 2020).

Another police officer made it clearer that:

They are very vast and knowledgeable in the area of technology and crime. What they only need is to send them for training in some specialized areas. Policing requires training and retraining of the officers at colleges and the academy for speciality (KII, a Top Police Officer at Akungba – Akoko Division, 3rd July 2020).

Other top senior police officers at Ogbagi – Akoko claimed as follow on the technological know-how among the police officers concerning the use of data-based technology in crime control as:

The few officers who are knowledgeable in forensic intelligence fields are not usually posted to the criminal investigation department (CID). Thus, they are not utilizing the knowledge. Some of them are computer literate, but they are not utilized. This is

a big problem (KII, a Senior Police Officer at Ogbagi – Akoko Division, 2nd July 2020).

Similarly, this position was strengthened by the response from another participant among the high ranked police officer who stressed further that:

Nigeria police still need to put in their best to make sure that those who are professionals are put in the right place where they are fit. Can you imagine that someone who was trained in computer science/engineering is being posted to be controlling traffic on the road? Such a person's brain will be retarded (KII, a Senior Police Officer at Igbokoda Division, 23rd June 2020).

Contrastingly, another senior police officer said further that:

Some officers with secondary school certificates are not developing themselves in the profession. It is surprising that in a whole department/unit in the police headquarters with over 20 police officers only a person can operate a computer. I may conclude here that, among the Nigerian police there is still inadequate technological know-how on forensic intelligence among the personnel (KII, a Senior Police Officer at Police Headquarters, Akure, 24th June 2020).

On the *legality* of the use of data-based technology in crime control in Nigeria, one of the high ranked police officers at Bolorunduro police division logically explained and stated that:

If the use of data-based technology is not legal it will not be introduced at all in Nigeria. Thus, before data-based technology is introduced into Nigerian policing there must be legal backup (KII, a Senior Police Officer at Bolorunduro Division, 18th June 2020).

Another key informant among the top police officers in an interview session suggested that:

Government should enact a law that can back up electronic, data-based technological evidence for admissibility in the court in the prosecution of offenders. The law could be enacted as a separate law or affix under the cybercrime law of 2015 or support the Evidence Act 2011 (KII, a Senior Police Officer at PPRO office, Police Headquarters, Akure, 19th June 2020).

Furthermore on the investigation conducted, one of the senior police personnel in the interview illustrated how he felt about the *socio-cultural factors* that can influence the cooperation of the public to provide information for database technology in crime control in Nigeria. An excerpt goes thus:

Giving information to the police is one of the duties of the members of the public, but they do not feel like giving information to the police because they do not have trust in the police. This discourages the public to confide in the police. When there is no good relationship between the member of the public and the police, there will be lapses in the security issue of the state. Members of the public need to be re-orientated about policing in Nigeria. They should have the notion that “police is your friend” (KII, a Senior Police Officer at Uso Division, 26th June 2020).

On the security of the vital national information in the data-based technology against hackers and fraudster, a senior police officer reveals as follow:

Nigeria police also need to be versatile and have vast knowledge on cyber-crime and security before they can curb the problem of hackers and fraudsters. The use of code for security could help in this regard to secure the stored information on the database (KII, a Senior Police Officer at Irele Division, 22nd June 2020).

Another senior police officer buttressed the above that:

The computer to be assigned to the police should be given security codes to secure the stored data, which outsiders will find difficult to access. These security codes should only be accessible by the professional police officers in such unit/department (KII, a Senior Police Officer at Igbokoda Division, 23rd June 2020).

A senior police officer also reiterated the epileptic power supply in Nigeria as a big challenge to the implementation of data-based technology for crime control. An excerpt revealed thus:

The epileptic power supply is a big problem of the whole Nigeria. Not until there is a stable power supply, data-based technology cannot be effective in Nigeria policing. In a nutshell, there is the need to solve the problem of epileptic power supply in Nigeria first either through solar energy or any other means (KII, a Senior Police Officer at Ile – Oluji police Division, 19th June 2020).

Moreover, the key informant interview with the high ranked police officers also revealed the followings on lack of a uniform international method of data-based:

There cannot be a uniform method of recording criminal data, because the crime rate of every state is not the same (KII, a Senior Police Officer at Akure Area Command, 26th June 2020).

Another top police officer added that:

If someone is in Nigeria committed a crime in America via online transaction, you know these two countries have their treaty (Legal Agreement) and with the use of INTERPOL, they will assist the other country to nab the criminal once there is a complaint about the suspect and the criminal act (KII, a senior police officer at Area Command Akure, 26th June 2020).

Besides the above-stated challenges to the effective and efficient use of data-based technology for crime control in Nigeria, the responses to the open-ended questions in the questionnaire revealed other challenges to include: Bad political leadership style in the country, corruption, embezzlement, diversion and siphoning of Nigeria police allocated funds, low competency in information technology and lack of necessary software and tools, lack of central data-based that collects information from the time of birth to death, illiteracy on the part of citizens that fail to register their data in biometrics, selfish interest of people in power because a lot of the criminal elements are often used by them to perpetrate their political manipulations (thus, they would not support the use of data-based technology for crime control), poor personnel welfare management schemes. An example of over-time duty, unavailability of needed instruments to enhance effective learning of skills, lack of maintenance culture in Nigeria police, avoidance of self-incrimination (some people in the force know much about the use of a computer to commit a crime and they are also the perpetrator of computer crime. Therefore, such people will never encourage the use of data-based technology to control crime in Nigeria. They will never support the implementation of such a policy that will go against them).

Discussion of Findings

The study found that most of the police officers are below 50 years old, male officers and married. They are mostly Christian worshippers. Most of them have tertiary educational experience and most of the respondents are being in the profession for at least 1 year to 19 years as it constitutes 80.8% of the respondents. The majority of the police officers are well aware of the relevance of data-based technology in crime control in Nigeria, as one of the best modern ways to collect and collate information technologically with the aid of a computer to store and retrieve data for crime investigation. There are a lot of benefits in using data-based technology for crime control in Nigeria. Data-based technology is very useful for criminalistics and forensic intelligence among the police. It is a contemporary means of controlling crime. It is very useful for accurate, reliable crime investigation and quality crime evidence analysis; as well as, effective communication system within the police operation. It is very fast and easy to get a record of a criminal.

However, Nigeria police system militates against several challenges. They have the manpower, but they need to be trained and re-trained with the provision of adequate facilities and equipment. The study also found that the only criminalistics data-based technology is in the Force Criminal Investigation Department (FCID) at Abuja, and it is not adequately functional. Among the major challenges of data-based technology for crime control in Nigeria is lack of

fund to procure equipment and facilities, epileptic power supply, corruption, lack of forensic skills by the police officers, poor recording culture, lack of fund to train the police personnel in forensic intelligence, lack of political and legal-will for the implementation of laws, lack of technological know-how among the police, lack of cyber-security against hackers and fraudsters, low morale of the police officers (lack of motivation), and so on.

Furthermore, the majority of Nigerian Police officers are not computer oriented but rely on the manual method of operation, they lack the required knowledge in some special areas. The few computer literates among them are not utilized, because of wrong posting. The use of database technology for crime control still lacks the needed legal backing to make its adoption. Data-based technological evidence is not usually admissible in the court of law for the prosecution of offenders (suspects) due to the lacuna in the laws in Nigeria. Also, the public usually declines to give information to the police, because of a lack of trust and confidence in the Nigerian police officers. There is no cordial relationship between members of the public and the police, which lead to a lack of forensic intelligence that could aid the work of the police in crime control. In addition, Nigeria police lack a uniform method of recording criminal data. The Interpol in Nigeria is not adequately functioning for crime control, criminalistics and forensic intelligence.

This study found that the necessity of data-based technology and criminalistics for crime control in Nigeria cannot be over-emphasized, as it is a contemporary means of crime prevention and control. Although, researches revealed that, several scholars have written on the use of technology in the control of crime, such as Aspen, 2004; Ayinde and Agwu, 2016; Inman and Rubin, 2001; Ribaux, Girod, Walsh, Margot, Mizrahi and Clivaz, 2003; and so on. None of these researches has been able to connect the nexus between data-based technology, criminalistics and forensic intelligence for policing in Nigeria. This study revealed that data-based technology and criminalistics has not been adequately engaged in Nigeria policing due to its low awareness and several challenges.

The uniqueness of this study is derived from the research design, methodology and findings. This study triangulates the research design and methods of data collection. Also, none of the above and previous researches is as recent as this study; and no one dissects and demystifies the knowledge of data-based technology, criminalistics and forensic intelligence-led policing with criminological analysis in Nigeria as this very study. The study emphasizes the relevance of data-based technology, criminalistics and forensic intelligence for crime control in Nigeria as a necessity at this peak period of criminality in

Nigeria. On the other hand, this study reveals the challenges to the use of data-based technology and criminalistics for forensic intelligence policing in Nigeria. Majorly, Nigeria still lacks the political will and leadership needed to create the conducive environment and the legal framework for the implementation of data-based technology for criminological analysis.

Recommendations

Based on the major findings of the study the following recommendations were suggested to encourage the use of data-based technology for effective and efficient criminalistics AND crime control in Nigeria:

1. Nigeria police officers need to be adequately trained and re-trained (education) on the use of database technology for criminalistics and forensic intelligence. The police officers should be computer-oriented, and trained on the change from an analogue system of operation to digital. The police officers in this special area should be given the required knowledge to ensure them with the technological know-how for the profession. Good record keeping culture (biometric data) should be encouraged through orientation among the police officers.
2. The federal government of Nigeria should provide adequate funds to provide the required logistics for the procurement of equipment, devices and facilities useful for data-based technology, criminalistics and forensic intelligence for policing. The government also needs to provide adequate funding to train the police personnel in forensic intelligence and other modern specialized areas in policing. Government must ensure control of mismanagement of fund, corruption, embezzlement misappropriation of the funds. There should be the good motivation of the personnel (welfare) to encourage them in the training on the use of data-based technology for Nigerian policing.
3. Data-based technology, criminalistics and forensic intelligence cannot be functional without an adequate and stable power supply. There is the need for the provision of a stable power supply at the central control station and other sectional units. Nigeria government needs to create, maintain and sustain a stable and quality power supply to support effective and efficient use of data-based technology to control crime in Nigeria.
4. Functionality and effective use of data-based technology, criminalistics and forensic intelligence in Nigeria policing depend on the legal and

political will. Nigeria political leadership needs to create the political will, legal framework and conducive atmosphere that supports the effective use of data-based technology to control crime. There should be a law that backs it up and proper implementation of the law for the admissibility of forensic intelligence's evidence in the court of law.

5. Effective use of data-based technology to crime control needs good public policy and international relationships. The federal government of Nigeria should encourage the "Interpol of the Nigeria police" to work effectively together as synergy with other countries police with the aid of a data-based technological system to curb cyber and other crimes since there is no uniform international method of a database system.

Conclusion

This study concluded that currently in Nigeria the rate of criminality is very high and the means of controlling it is still at very low gear. As criminality advances, so also the means of its control needs advancement. One of the ways forward to adequately prevent and control crime in Nigeria is the implementation of data-based technology and criminalistics for forensic intelligence-led policing in Nigeria. Also, if this means will be adequately implemented, the challenges militating against it in Nigeria must be adequately addressed. Nigeria has the human resources needed for policing Nigeria, but the facilities and knowledge needed are still inadequate. Hence, there are reports of kidnapping, banditry, armed robbery, cybercrimes, trafficking, assault, raping, killing, bank robbery, abduction, and many more on a daily routine without adequate arrest and prosecution.

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Table 1: Socio-Demographic Characteristics of the Police Officers

Age of the Respondent	Frequency N = 553	Percentage
20 – 29 Years	239	43.2
30 - 39 Years	144	26.0
40 - 49 Years	119	21.5
50 - 59 Years	51	9.2
60 and Above	0	0.0
Sex		
Male	371	67.1
Female	182	32.9
Marital Status		
Single	232	42.0
Married	321	58.0
Religion Affiliation		
Islam	121	21.9
Christianity	432	78.1
Educational Status		
Primary	1	0.2
Secondary	101	18.3
Tertiary	281	50.8
Post-Graduate	170	30.7
Years in Service		
Below 5 Years	127	23.0
5 - 9 Years	149	26.9
10 - 14 Years	43	7.8
15 - 19 Years	128	23.1
20 - 24 Years	42	7.6
25 – 29 Years	34	6.1
30 – 34 Years	30	5.4
35 Years and Above	0	0.0

Sources: A.O. Idowu, 2020

Table 2: Benefits of Data-Based Technology for Crime Control in Nigeria

Benefits of Data-based technology for crime control	Yes F (%)	No F (%)
Crime detection.	542 (98.0)	11 (2.0)
Crime prevention due to pro-activeness.	481 (87.0)	72 (13.0)
Crime reduction due to deterrence.	507 (91.7)	46 (8.3)
Accurate and reliable crime investigation.	538 (97.3)	15 (2.7)
Fair and fast case prosecution in the court of law.	481 (87.0)	72 (13.0)
Genuine information and intelligence gathering.	534 (96.6)	19 (3.4)
Quick detection of offenders.	489 (88.4)	64 (11.6)
Quick and ease apprehension of offenders.	518 (93.7)	35 (6.3)
Establishment of factual evidence in a case.	521 (94.2)	32 (5.8)
Quality crime evidence analysis.	531 (96.0)	22 (4.0)
Dynamic and innovative technique of crime intelligence.	496 (89.7)	57 (10.3)
Maintenance of the integrity of the stored data.	494 (89.3)	59 (10.7)
Reduction in redundancy and inconsistent information.	513 (92.8)	40 (7.2)
Acquisition of digital data for crime analysis.	520 (94.0)	33 (6.0)
Effective communication system within the police.	542 (98.0)	11 (2.0)
Police accountability and accuracy.	514 (92.9)	39 (7.3)
Enhancement of police legitimacy.	515 (93.1)	38 (6.9)
Improved surveillance and security.	526 (95.1)	27 (4.9)
Reduction in the cost of processing case in CJS.	396 (71.6)	157 (28.4)
Ease and fast searching for data in the archive for retrieval.	499 (90.2)	54 (9.8)
Increasing public safety and security.	483 (87.3)	70 (12.7)
It aids the exoneration of the innocent of crime.	495 (89.5)	58 (10.5)
It helps to link chain-suspects to family members.	452 (81.7)	101 (18.3)

Sources: A.O. Idowu, 2020

Table 3: Challenges of Data-Based Technology for Crime Control in Nigeria

Challenges of Database Technology	Yes F (%)	No F (%)
Inadequate manpower in the police.	435 (78.7)	118 (21.2)
Lack of fund to procure equipment and facilities.	536 (96.9)	17 (3.1)
Low level of education among the police.	353 (63.8)	200 (36.2)
Low morale of the police officers (lack of motivation).	466 (84.3)	87 (15.7)
Lack of technological know-how among the police.	473 (85.5)	80 (14.5)
Lack of security, privacy and protection of stored data.	462 (83.5)	91 (16.5)
Lack of forensic skills by the police officers.	488 (88.2)	65 (11.8)
High level of corruption and human manipulation of data.	492 (89.0)	61 (11.0)
Lack of cyber-security against hackers and fraudsters.	469 (84.8)	84 (15.2)
Non-awareness of usefulness of data-based technology.	444 (80.3)	109 (19.7)
Epileptic power supply in Nigeria.	493 (89.2)	60 (10.8)
Lack of uniform international data-based technology.	437 (79.0)	116 (21.0)
Lack of political and legal-will for the implementation.	478 (86.4)	75 (13.6)
Socio-cultural diversity and heterogeneity in Nigeria.	313 (56.6)	240 (43.4)
Lack of legal support to protect human's rights (privacy).	412 (74.5)	141 (25.5)
Inadmissibility of evidence in compliance to the law.	414 (74.9)	139 (25.1)
Divergence of religion and perception to accept it.	364 (65.8)	189 (34.2)
Poor culture of recording system in Nigeria.	486 (87.9)	67 (12.1)
Lack of fund to train personnel in forensic intelligence.	479 (86.6)	74 (13.4)
Difficult to apprehend and prosecute cyber-criminals.	403 (72.9)	150 (27.1)
Lacks of legal support to the use of data-based technology	429 (77.6)	124 (22.4)

Sources: A.O. Idowu, 2020

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