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Campus Crime Reporting Software Framework Using Short Message Services (SMS)

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Abstract

Many reports have indicated that nefarious students in many of tertiary institutions of higher learning in Nigeria engage in different forms of crimes, such as cultism, homicide, property theft/robbery, sexual harassment, to mention but a few, whereas curbing these immoral acts are the responsibilities of the established security outfit of the institution. The perpetrators of such evil acts go scot-free as a result of inappropriate system of apprehension. This study proposed a software framework of campus crime reporting through the use of short message services using hand-held devices, such as, mobile phones. The methodology adopted in designing of software is Object Oriented Analysis and Design (OOAD) approach, using android software development kits. The developed software is tested, and result indicated that the crime and the location at which crime is committed as well as date/time are captured by reporter (student) in SMS format and sent via mobile line of security agent in the institution campus to make necessary arrangement to arrest the criminals at the identified location before the perpetrators flee away.

Keywords: *Campus, Crime Reporting system, OOAD, Short Message Services, Security Agents*

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Background to the Study

Crime is an act that brings about offences and when committed, the offenders are punished under the stipulated laws of the society (Oguntunde, Ojo, Okagbue & Oguntunde, 2018). Crime is a general phenomenon which is part and parcel of every society; colleges/ schools/universities are inclusive, though the degree of offence may differ from one place to another (Usman, Yakubu & Bello, 2012; Adebayo, 2013; Ghani, 2017). For instance, gay marriage has been approved by United States of America (USA) whereas such act is punishable offence in Nigeria. Also, aborting unwanted pregnancy openly is illegal in Nigeria whereas it has been legalized by South Africa government (Morroni, Myer & Tibazarwa, 2006).

Crimes of different kinds have been reported in various higher institutions of learning, especially in Nigeria ranging from sexual harassment/assault, cultism, examination malpractices, homicide, robbery, cybercrime, to mention but a few (Okeshola & Adeta, 2013; Yusuf. & Idoghor, 2016; Igba, Igba, Nwambam, Nnamani, Egbe & John, 2018 and National Center for Education Statistics–NCES, 2018). Today, cases of sexual harassment or immorality are common between a male lecturer and female student in many higher institutions in Nigeria (Adogu, Adinma, Onyiaorah & Ubajaka, 2014; Law Care Nigeria, 2020 and Orjinmo, 2020) and many lecturers were sacked for this offence if found guilty by the management of such institution. For instance, a case of 300 level female student of the Department of Mass Communication Delta State University Abraka, whose name is Elozino Ogege was killed in cold blood in a nearby bush of the university by a gang, known as "yahoo boys" on the 19th of November 2018 (Asiyai1 & Oghuvbu, 2020).

On this note, Oni (2016) expressed that the main idea of crime and criminality is centered on motivation with accorded expression of opportunity, thus, motivation plus opportunity is equal to crime, mathematically speaking, Crime = Motivation + Opportunity. Crime existence on earth is as old as man. This assertion is proved in the history of Cain and Abel (the offspring of Adam & Eve) that Cain (first son of Adam) committed first crime on earth when he killed his blood brother (Abel) as a result of jealousness (Gillani, Mahmood, Rehman & Rashid, 2008; Jalil & Iqbal, 2010). Since that period the act of criminality has continuously expanding till present time around the world, thus, the extension to campuses, even at secondary level, for instance, cultism (Popoola & Alao, 2006).

In Nigeria, management of every institution established a security post in the campuses that curbs the menace of crimes within their domain. However, some nefarious students or staff commit crimes and go scot-free as a result of inappropriate system of reporting crime to the security post. For instance, if a student commits a crime, other students who witness such crime may not report to security post because of fair that he/she may be attacked by the perpetrator. Having looked at this problem, this study proposes a solution in form of short message services (SMS) which can be sent from reporter (witnessed student) to the security post. The security in turn gets ready and mobilizes his team to the scene of incident and arrests the perpetrators without wasting much of time.

Types of Crimes

Crimes are of different types and what connotes a crime may differ from one country to another, but generally as opined by Peeler (2017), crimes are of four types: personal crimes, property crimes, inchoate crimes and statutory crimes. In words of Sowmyya (2014), crimes can be classified into eight categories, namely; personal crimes, property crimes, victimless crimes, white-collar crimes, organized crimes, juvenile delinquency, computer crime and violation of public safety. These crimes are summarized by (Aremu & Ahmed, 2011; Usman, Yakubu & Bello, 2012; Ukoji & James, 2016) as follows:

a) **Personal crime:** This crime is targeted at personality of a person and include; murder/assassination/homicides, offensive words, sexual assault, domestic/family violence, etc.
b) **Property crime:** This crime is committed on material property and include; burglary, theft/ pick pocketing, vehicular theft, vandalism, etc.
c) **Victimless crime:** This is an act against moral values of a person and include; prostitution, illegal gambling, illegal drug use, etc.
d) **White-collar crime:** This crime is perpetrated by highly influential person who belongs to high caliber of people in the society and include; embezzlement, misuse of public funds or property, identity theft, fraud, etc.
e) **Organized crime:** This crime is committed by syndicate (two or more) criminals are involved in an organized manner and include; kidnapping, marketing of illegal or prohibited goods, money laundering, human trafficking, buying votes, etc.
f) **Juvenile delinquency:** This type of crime involves youth and is committed by an individual under the age of 18years. In Nigeria, criminal laws are applied to persons above 18 years' old.
g) **Computer crime:** This crime involves the use of computer and ICT gadgetries to commit crime, such as cybercrime, Internet bullying, Internet fraud, etc.
h) **Violation of Public Safety:** This crime is violation of laws which threaten public safety and include; disorderly conduct, driving under the influence of alcoholic drinks and drugs, terrorism, etc.

Related Works

Researchers have conducted research on means of tackling crimes. For instance, Asiyai1 and Oghuvbu (2020) conducted a study on prevalent of crime in tertiary institutions in southwest Nigeria purposely to ascertain common crimes in various schools and recommend way out of management strategies in curbing the crime. Sample of 932 respondents were drawn from population of tertiary institutions in the region using stratified random sampling technique from nine tertiary institutions in southwest Nigeria. The instrument used for data collection was questionnaire which was divided into three sub-scales. Cronbanch alpha was used to test reliability of the instrument and yielded 0.84, 0.80 and 0.76 for each of three subscales. The results showed that examination malpractices, sexual abuse, assault, plagiarism and certificate/documents forgery were among common crimes in the studied institutions in the region. The study recommended the mounting of closed-circuit cameras in strategic locations of the institutions through which activities of criminals could be monitored.

Campus Crime and Fire Statistics Report was initiated and disclosed by Clery (2021) that Campus Security Policy and Campus Crime Statistics Act is a federal law which gives orders to colleges and universities to provide details about crime in and around their campuses. The law directs colleges and universities to do everything possible to develop security policies that would issue crime alerts to safe-keep all daily crime logs. The law is also aimed to provide students and their families with up-to-date, accurate, complete and timely information about safety on campus.

Furthermore, National Drug Law Enforcement Agency- NDLEA (2022) proposed a measure to reduce criminal activities in Nigerian university system by enforcing drug integrity test for both new and returning students. The drug test is expected to transform into an anti-drug policy for all higher institutions of learning in Nigeria. Such policy will be implemented on any students found guilty of drug abuse. The Drug Integrity Test (DIT) is not a punitive measure; rather an early detection tool to ascertain an individual's drug use status for appropriate intervention and timely treatment so that other students can be free from the act.

Moreover, Ramos, Israel, Bautista, Gumogda, Recto and Sular (2017), developed a crime mapping application that can be used as a platform of information exchange between the law enforcement agents and the community to purposely strategize in addressing issues related to crime. The study adopted a systematic investigation for 408 respondents that participated in the survey. V-shape Model of software development approach was employed to ensure that all essential ingredients of the software requirements were reviewed accordingly. The developed software was evaluated using International Standard Organisation (ISO9126) in terms of its functionality, usability, portability, reliability, and efficiency. The result of evaluation yielded 3.92, which is very satisfactory. This implies that software produced was tested and had a very satisfactory rate from the users' side.

Similarly, Okon, Agorye and Aov (2021), carried out an investigation on the significance of crime mapping in Makurdi metropolis through the use of Geographical Information System (GIS) applications with the aim to enhance identification, mapping, patterns and trends of crime. Data were collected from police station using crime incident files and the spatial data were obtained from fieldwork. From the five (5) police divisions, the distribution of crimes and the variation of crime cases were accessed. Division B had the highest crime incidences. In the same vein, crime hotspots in the area were determined. The results of one-way analysis of variance showed a statistically significant difference in the distribution of crime incidents among the 5 police divisions ($F(4,100) = 3.767$, $p < 0.05$). The study recommended that there is need for the establishment of GIS units in all police stations to aid crime analysis for effective mobilization of police patrol teams.

In another development, Dabhere, Kulkarni, Kumbharkar, Chhajed and Tirth (2015) designed and implemented a system called "Crime Area Detection and Criminal Data Record" using Information and Communication Technology (ICT) tools (Mwiya, Phiri & Lyoko, 2015) for crime reporting with the aid of Internet cloud. In the system, Android application is made available to police during their investigation and at the same time mobile

application is also produced for user (crime incident reporter) in order to speed up entire process of apprehending reported criminals in the system. Besides, Ugwuishiwu, Ugwu and Inyiamah (2013) demonstrated an online real time crime information system for NDLEA in Nigeria. The system architecture provides some key components together with the communications between these components. This system architecture comprised an informant, NDLEA Head Office, branch offices across the country, Database Management System (DBMS) and a web-based application. The system works in such that when a drug related crime is detected by an informant, the informant sends message using mobile phone or personal computer through a web application to NDLEA office by opening NDLEA website. The message is delivered at NDLEA state office (local level) by showing alert on the screen which notifies officer in charge that a crime has occurred at the location specified by the sender. This enables NDLEA officer to instantly mobilize officers to initiate the crime investigation process and where the case can be adequately handled by state branch, it will be immediately referred to head office for a necessary action. The crime information contains the location of the crime, time it occurred, date of the incident, name of suspect if available and the type of crime committed. A copy of the information is stored in the NDLEA database when sent. Delivery report is also sent back to the informant acknowledging that the message has been successfully delivered. The NDLEA Database contains all the NDLEA crime information which can be used when need arises.

Besides, Sharma and Shahnawaz (2014), implemented a Crime Records Management System (CRMS). The proposed system was tailored towards its application across all police stations across India. With the developed system, phase implementation method was adopted as it was firstly implemented in cities or towns and later interlinked cities together so that any detective police can access crime details across from the available records in the state thereby helping speedy and successful completion of criminal cases. The project also used distributed architecture with centralized storage of the database. The software has six modules: station, citizen, crime, search, administrators and avocation module. The criminal database was handled using constructs of SQL server at backend and all the user interfaces were developed using Microsoft ASP.NET.

Also, Shah, Fayaz, Shah, and Shah (2016), designed software for police station in Pakistan to manage and maintain record of police station properly. The developed application software was designed in way that data storage and retrieval was made easy when compared with existing system, that is, manually system of data handling. The software was tested using flow of automated testing activities technique. The five stages of automated testing activities used were prioritizing test cases, dividing test cases into different categories, selection of testing tool and environment, coding & simulation and perform validation & verification. The result of the tested software indicated that it is efficient, reliable, portable and can be easily maintained in the police station. A computer-based security framework for crime prevention in Nigeria was carried out by Ogunleye, Adewale, Alese and Ogunde (2011) to address community perception on the effectiveness and acceptability of Closed Circuit Television (CCTV) tool in public places. The CCTV stores the image and records videos/audios of criminal without his/her prior knowledge. The stored images/video/audio can later be analyzed by crime

forensic experts to visualize the criminal trespass into a building, hall, office, etc. It was reported that respondents gave good indicators in supporting the implementation of the tool. This work strictly looked at CCTV camera as a measure for crime prevention in Nigeria. It was a survey research and questionnaire and interviews were used in collecting data for the research.

Similarly, Okonkwo and Enem (2011) carried out research on combating crime and terrorism using data mining techniques. In the research, data mining technique was seen as a tool that can be used in tracking the activities of criminals. Available different algorithms and techniques of data mining to analyze and scrutinize data were x-rayed in the work. These include classifications, link analysis, classification, etc. The research positioned that if data mining techniques are imbibed by government with expert ideas, the activities of criminals and terrorists can be curtailed. In the same vein, Kawai and Samson (2011) developed a criminal record information system to assist Nigerian police in their bid to solve crimes with timely and useful information about the criminals as well as the mode of their operations so as to nib the criminal activities in a given locality in the bud. The researchers adopted structured system analysis and design methodology (SSADM) to capture all necessary detail from the police, develop and implement the system. The software was implemented in Vb.net programming environment to develop user interface at frontend and Microsoft structured query language (SQL) server was used at the backend. These modules in the developed software work as expected.

A critical look at the reviewed articles above, it can be observed that most of these article's dwell on effective management of criminal information by police officers within a press of button through the use of database technology and this eventually eliminate problems encountered while manual technique is applied. Other articles proffer solutions on crime reporting using database technology, geographical positioning system coupled with mobile phones or computing device. Much of these have not been tailored towards crime reporting in Nigerian universities/college/schools' system and this present study is aimed to do that.

Materials and Method

In this study, the required tools for the development of the software are an android mobile phone with the registered SIM card at both student and security post ends. Android IDE (Integrated Development Environment) known as android studio must be installed on the computer system. User interface design was developed using android studio IDE with careful study of all user requirements elicitation. All the necessary support files (libraries) needed to make software function well were downloaded and installed on the computer system.

Besides, Object-Oriented Analysis and Design (OOAD) methodology was employed in the sense that Unified Modeling Language (UML) tools, such as, use case diagram, sequence diagram, class diagram, activity diagram and collaboration diagram were used in modeling analysis and design processes. Figure 1 depicts research objective and how it was achieved using the above-mentioned methodology.

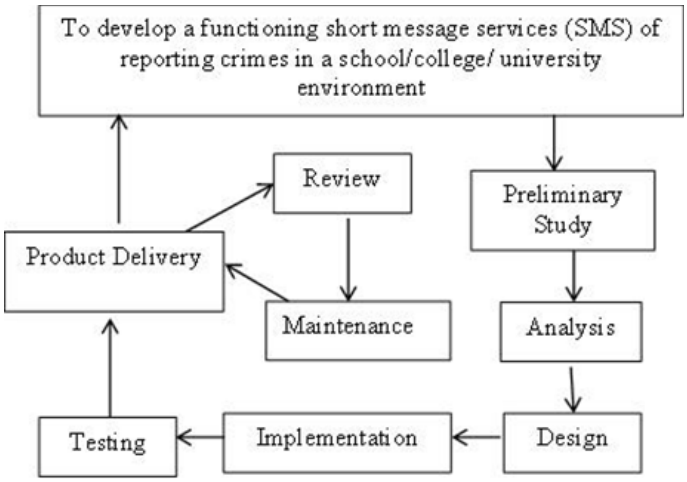

Figure 1: Research Methodology Stages

(1) Preliminary Study Stage: In this stage, the existing system was studied with a view to automate and find solution to maual system of reporting crimes in the campus. It was technically, economically and operationally visbile to implemt the new system, (SMS system of reproting crimes). After this, top management of the institution were enagegd in requirement elicitation to identify the scope of the the system in terms of users that will have different priviledges/roles to use the system. At this stage, head of the institution/registrar (admin.), chief security officer and students were identified users. Figure 2 illustrates use case diagram of the users of the software.

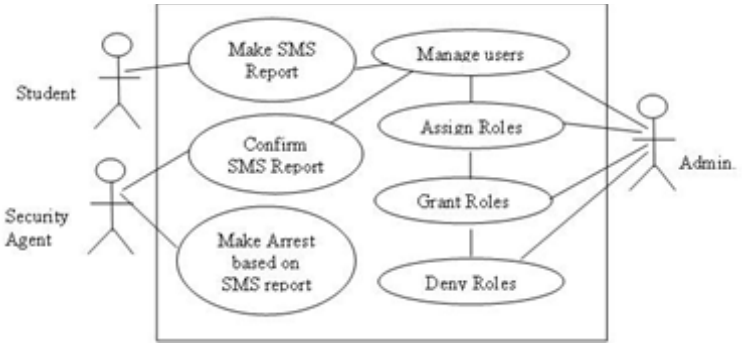

Figure 2: Illustrates of use case diagram of the users of the software.

(2) Analysis Stage: In this phase, software developers collect and gather all necessary information that make entire system works effectively. Hence, consultations were made which involve all users or their representatives mentioned in the first phase. During this phase, information gathering techniques (requirement elicitation), such as, structured and unstructured questionnaires, interviews, onsite observations and document analysis (if any) were collected to aid in the new design. Tools, such as, use-case, activity diagram and sequence

diagram were employed to detail the report of the analysis stage. Such use case diagram is employed here to detail users' requirements, and it is shown in figure 3.

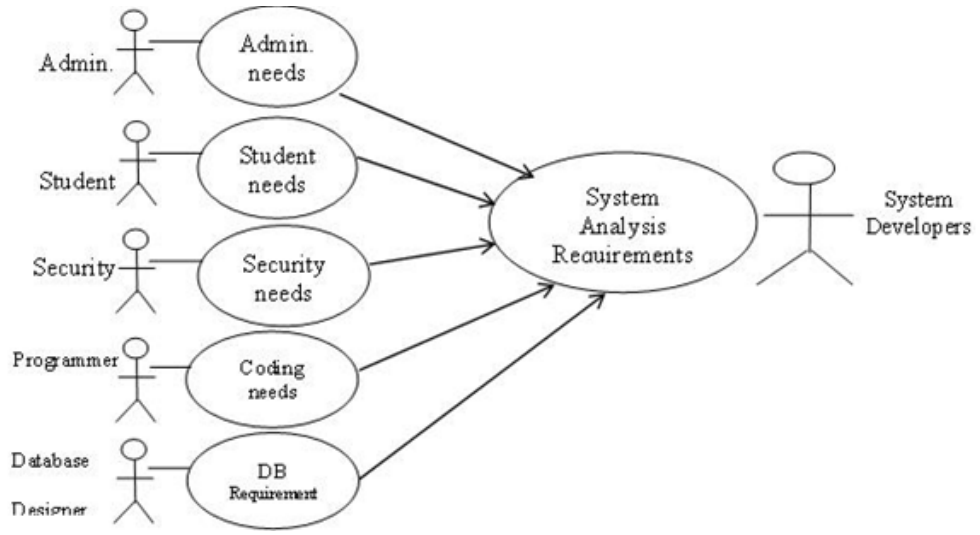

Figure 3: Illustration of use case for users' requirements / needs for software development

(3) Design Stage: This phase is all about actual translation of the stated needs/requirement into modeling and it consists of three important aspect of modeling which focused on crime details (location description) within the campus, student details (SMS reporter's details) and security officer details (who will make arrest), These details consist of many illustrations and are not depicted here to limited space.

(4) Implementation: This segment is all about coding of program which was designed in android studio Integrated Development Environment (IDE). Users interface was developed and tested to ensure that expected results are produced. MySQL was used for database implementation at the backend. The frontend interface was very simple and users friendly. The architectural design/framework of the developed campus crime reporter software is depicted in figure 4.

(5) Testing: This is concerned about test running of the program to ensure that it produces the required output. At the developer site, software was tested to ensure that any generated bugs/errors are corrected before delivering at the user site. The user also tests run the software to see if the exact output needed is produced. All errors observed were corrected and software was updated and installed at the user's site for full direct implementation.

(6) Product Delivery: This is phase where software developers deliver/deploy the product to the organization by installing it together with all the necessary support libraries and documentation.

(7) Review: In this stage of software development, after delivery of product, some reviews may come up which were not captured in the initial stage of development and organization wish to include in the product. In this case, software will be reviewed by the developer and those functionalities will be included.

(8) Maintenance: It is a stage that may not require software developer again. It is all about frequent updates and downloads. This can be done by admin of the system, where it is not possible, the organization can contact the developer for further assistance.

Results

This section shows detailed output of the study. Here, the actualization of the stated objectives of the study is expected. From the figure 4 below, it can be seen that student sends crime report using mobile phone with these details; crime type, location, date, time and student Reg. No. to an accredited GSM line of institution security agent in the campus and security will in turn mobilize his team to apprehend the criminals/perpetrators of a crime at the specified location by the reporter (student). Admin. (Head of institution/registrar) can sanction any student with fake report by tracing registration/matric number and phone number.

Figure 4: Architecture/Framework of Developed Campus Crime Reporter Software

Screenshot shown in figure 5 below gives detailed structure of reporting system on the student's mobile phone.

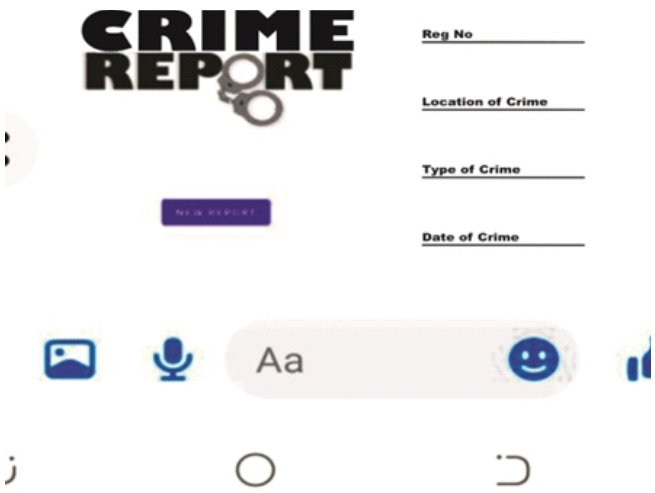

Figure 5: Reporting of Crime Incident by a Student

Screenshot depicted on figure 6 below is sample reported case of a crime to the security post of a school campus while the test-running the software.

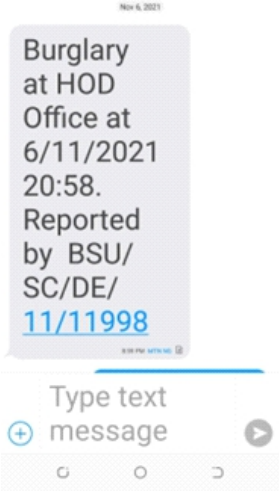

Figure 6: Sample reported case of Burglary crime to the Campus Security Post

Discussion of Results

In this work, a software framework was developed for reporting crimes in the campuses of Nigerian institution using OOAD methodology. The study also implemented software, test-run it to ensure the expected output is generated. The designed software is user-friendly, which is one of the criteria for development of good human computer interaction. This is in line with the work of Ramos et al (2017) that developed a crime mapping application as a platform for information between the law enforcement officers and the community in order to specifically address problems related to crimes.

The result obtained is also similar with work done by Okon, Agorye and Aov (2021) which made instances of significance of crime mapping in Makurdi metropolis of Benue state, Nigeria using GIS applications in improving identification, mapping and presentation of crime patterns and trends in the area. Besides, the finding in this study corroborates the work of Ormachea, Haarsma, Davenport and Eagleman (2015) that implemented a criminal record database (CRD) for recordings all criminals' cases in United States of America (USA).

Similarly, the finding in this work is in agreement with the study of Oludele, Onuiri, Olaore, Sowunmi and Ugo-Ezeaba (2015) that implemented crime records management system for the Nigeria Police Force (NPF) and employed waterfall model for the stages of software development. Further, design tools, such as, entity relationship diagram (ERD) was used for the database and use case diagrams was as well utilized in describing user requirements. The result obtained in this study is also in consonance with the 'CRIMES' software developed by Webb (2017) which is presently serving 54 different local law enforcement agencies in the State of Texas. The development software consists of different modules aimed to capture criminal data across various law enforcement agencies. The software was designed with ease of access and operation by local police officers.

Conclusion

This study examined development of campus crime reporting software framework using SMS. The need for this type of system in Nigerian higher institutions of learning for reporting crime is very crucial, especially, during the period where waves of different crimes are prevalent in our institutions. One of the advantages of the system is ability to report crime without being physically present at the security post of the institution and this will help institution management in curbing crimes within their domain easily because first-hand information on crime can be easily sent to the security post who in turn makes a swift response to mobilize security personnel to visit the described location in the message and finally apprehend the perpetrators.

References

Adebayo, A. A. (2013). Youths' unemployment and crime in Nigeria: A nexus and implications for national development, *International Journal of Sociology and Anthropology. 5(8)*: 350-357

Adogu, P. O. U., Adinma, E. D., Onyiaorah, V. I. & Ubajaka, C. F. (2014). Perception, prevalence and predictors of rape among female students in a tertiary institution South East Nigeria, *International Journal of Clinical Medicine*, 5, 819-828. http://dx.doi.org/10.4236/ijcm.2014.514110

Aremu, M. A. & Ahmed, Y. A. (2011). An investigation of security and crime management in developing society: The implications for Nigeria democratic Set-Up*, International Journal of Academic Research in Business and Social Sciences* 1(3), 390-399

Asiyai1, R. I. & Oghuvbu, E. P. (2020). Prevalent crime in Nigerian tertiary institutions and administrative strategies for its effective management, *International Journal of Higher Education, 9(2):* 270-279. doi:10.5430/ijhe.v9n2p270

Clery, J. (2021). *Campus crime & fire statistics report*, Retrieved from: /wp-content/uploads/Campus- Security-Report.pdf

Dabhere, A., Kulkarni, A., Kumbharkar, K., Chhajed, V. & Tirth, S. (2015). Crime area detection and criminal data record, *International Journal of Computer Science and Information Technologies, (IJCSIT)*, 6(1), 510-513.

Ghani, Z. A. (2017). A comparative study of urban crime between Malaysia and Nigeria, *Journal of Urban Management, 6(2017)*, 19–29.

Gillani, M., Mahmood, S, Y., Rehman, H., & Rashid, A. (2008). Unemployment, poverty, inflation and crime nexus: Co-integration and causality analysis of Pakistan, *Pakistan Economic and Social Review,* 47 (1), 79-98.

Igba, I. D., Igba, E. C., Nwambam, A. S., Nnamani, S. C., Egbe, E. U. & John, O. V. (2018). Cybercrime among University undergraduates: Implications on their academic achievement, *International Journal of Applied Engineering Research, (IJAER), 13(2)*, 1144-1154 http://www.ripublication.com

Jalil, H. H. & Iqbal, M. M. (2010). Urbanization and Crime: A case study of Pakistan, *The Pakistan Development Review*, 49(4),741-755.

Kawai, D. E. S. & Samson, D. H. (2011). Development of criminal record information system, *Nigeria Computer Society (NCS) Conference Proceedings on Information Technology for People-centered Development.* 22(2011): 108-114.

LawCareNigeria (2020). *The ordeals of rape victims in a Nigerian university (3),* Retrieved from https://www.premiumtimesng.com/investigationspecial-reports/423623-special-report-how-unclear-policies-contribute-to-sexual-harassment-in-nigerian-universitiespart-1.html

Morroni, C., Myer, L & Tibazarwa, K. (2006). Knowledge of the abortion legislation among South African women: a cross-sectional study, *Reproductive Health Research 3(7):* 1-5. Retrieved from http://www.reproductive-health-journal.com/content/3/1/7 doi:10.1186/1742-4755-3-7

Mwiya, M., Phiri, J. & Lyoko, G. (2015). Public crime reporting and monitoring system model using GSM and GIS technologies: A case of Zambia police service, *International Journal of Computer Science and Mobile Computing,* 4(11), 207-226

National Center for Education Statistics – NCES (2018). *Fast and facts: College crime*, Retrieved from https://nces.ed.gov/fastfacts/display.asp?id=804#:~:text=Between 2009 and 2018%2C the, (from 26%2C800 to 29%2C100).

NDLEA (2022*). Nigerian anti-drug abuse agency asks universities to conduct drug integrity test for all students*, Retrieved from https://splendidblog.com.ng/nigerian-anti-drug-abuse-agency-ndlea-asks-universities-to-conduct-drug-tests-for-all-students/

Ogunleye, G. O. Adwale, O. S. Alese, B. K. & Ogunde, A. O. (2011). A computer-based security framework for crime prevention in Nigeria, *Nigeria Computer Society (NCS) conference proceedings on Information Technology for people-centred development.* 22(2011): 90-98.

Oguntunde, P. E., Ojo, O. O., Okagbue, H. I. & Oguntunde, O. A. (2018). Analysis of selected crime data in Nigeria, *Data Brief.(2018),* 1242–1249. doi: 10.1016/j.dib.2018.05.143

Oludele, A., Onuiri, E. E., Olaore, O. A., Sowunmi, O. O. & Ugo-Ezeaba, A. A. (2015). A real-time crime records management system for national security agencies, *European Journal of Computer Science and Information Technology,* 3(2), 1-12.

Okeshola, F. B. & Adeta, A. K. (2013). The nature, causes and consequences of cyber crime in tertiary institutions in Zaria-Kaduna State, Nigeria, *American International Journal of Contemporary Research 3(9),* 98-114.

Okon, I. E., Agorye, A. O. & Aov, K. F. (2021). Mapping the incidences of crime in Makurdi metropolis, Benue State, North-Central Nigeria, *Open Access Library Journal,* 8(6577), 1-15. DOI: 10.4236/oalib.1106577

Okonkwo, R. O. & Enem, F. O. (2011). Combating crime and terrorism using data mining technique, Nigeria *Computer Society (NCS) conference proceedings on Information Technology for people-centred development.* 22(2011), 80-89.

Oni, J. A. (2016). *Combating security challenges in the university system*, Being a presentation at the National Conference of the Association of Nigeria University Professional Administrators (ANUPA 2016)

Orjinmo, N. (2020). *We are tired: Nigerian women speak out over wave of violence,* Lagos: BBC News.

Ormachea, P. A., Haarsma, G., Davenport, S. & Eagleman, D. M. (2015). A new criminal records database for large-scale analysis of policy and behavior, *Journal of Science and Law,* 1(1), 1-7.

Peeler, T. (2017). *What are different types of crimes*? Accessed 8th January, 2021 from www.legalmatch.com

Popoola, B. I. & Alao, K. A. (2006). Secret cults in Nigerian institutions of higher learning: Need for a radical intervention programme, *Journal of School Violence,* 5(2), 73-85.

Ramos, A. L. A., Israel, S. D. A., Bautista, J. V. M., Gumogda, J. F. L., Recto, J. A. & Sular, L. J. P.T. (2017). Crime watch: Crime density indicator mobile map application using apriori algorithm, *International Journal of Computer Science and Mobile Computing, (IJCSMC),* 6(12): 128-141.

Sowmyya, T. (2014). Crime: A conceptual understanding, *Forensic Science,* 4(3), 196-198. Retrieved from https://www.researchgate.net/publication/270238380

Shah, A. S., Fayaz, M., Shah, A. & Shah, S. (2016). Testing desktop application: Police station information management system, *International Journal of Software Engineering and its Applications,* 10(7), 101-118

Sharma, A. & Shahnawaz, M. (2014). Crime records management system. *3rd International Conference on System Modeling & Advancement in Research Trends (SMART).* College of Computing Sciences and Information Technology (CCSIT), Teerthanker Mahaveer University, Moradabad, 6-9.

Ukoji, N. V. & James, O. (2016). Prevalence of Lethal and Non-lethal Crimes in Nigeria, *Journal of Advanced Research in Humanities and Social Science.* 3(1), 10-25

Usman, U., Yakubu, M. & Bello, A. Z. (2012). An investigation on the rate of crime in Sokoto State using principal component analysis, *Nigerian Journal of Basic and Applied Science, 20(2)*: 152-160.

Ugwuishiwu, C. H., Ugwu, K. C. & Inyiamah, H. C. (2013). Design and implementation of real-time crime information system for National Drug Law Enforcement Agency (NDLEA) in Nigeria, *African Journal of Computing & Information and Communication Technology (ICT),* 6(2): 129-136

Webb, V. (2017). *The criminal research information management evaluation system (CRIMES): A comprehensive records management system for smaller police. Center for Violence Prevention and Community Safety,* Arizona State University. Retrieved on 11th January 2021 from https://cvpcs.asu.edu/sites/default/files/content/products/Criminal_Research_Information_Management_Evaluation_System%20%20%281%29.pdf

Yusuf, H. O. & Idoghor, V. (2016). Integrating the concept of safety and security in reading comprehension of the English language curriculum for junior secondary schools in Nigeria, *European Journal of Educational Studies, 1*(2), 208-220.