DESIGN AND IMPLEMENTATION OF AN ONLINE CRIME REPORTING SYSTEM

BY

NNADIMMA, CHISOM EJIKE

159074209

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CERTIFICATION

I, NNADIMMA, CHISOM EJIKE with Matric number: 159074209 hereby certify that this project was carried out by me in partial fulfillment of the requirements for the award of Masters in Information Technology.

…… ……

DR. E. P. FASINA DATE

Supervisor

…… ……

DR. B. SAWYERR DATE

Head of Department

DEDICATION

I dedicate this project to Almighty God who alone is the source of my inspiration, divine wisdom and defense.

Also, to my mother Mrs. Victoria Obioma Anieto for her support to ensure that I complete this research work successfully.

ACKNOWLEDGEMENT

I must particularly acknowledge the invaluable contribution of my supervisor, Dr. E. P. Fasina. He took time to find appropriate research directions and constructively critic every approach before adoption.

My family members have been particularly supportive. They have not ceased to shower on me their gracious prayers and moral advice.

Abstract

An ideal society is governed by laws and measurable consequences are meted out to any member of the society that is found guilty of law breaking. Customarily, members of the society are expected to report any incidence of breakdown of law and order to the appropriate law enforcement authorities. In time past, the process of reporting crimes in the society (Nigeria) had involved going into any of the offices of the law enforcement agencies (e.g. Police, neighborhood corps) to make a report, which made anonymity next to impossible. But the advent of technology opened more avenues for reporting crimes; from telegraph, special radio communication, and dedicated phone lines to a more responsive and more pervasive technological application platforms (web and mobile software applications).

This project develops an all-encompassing web platform that reports all manners of crimes, open to all members of the public, suggestive (search for entities), interpretative and enlightening. It also provides anonymity while reporting crime, for those who desire

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Chapter One

Introduction

1.1 Background of Study

The quest to control crime and breakdown of law and order increases has the society grows and diversity of human intentions and interactions abound. An ideal society is governed by laws and regulations that are collectively agreed upon and measurable consequences that will be meted out for any member of the society that is found culpable to have floated any specific component of the legal infrastructure.

Besides the legal infrastructure in a society are the security apparatuses that enforce the law with the interest to maintain law and order. The legal infrastructures determine the extent to which law enforcement agents can act or protect the common interests of individuals in the society. It also outlines the civic responsibilities and human rights for the members of the society.

Customarily, members of the society are supposed to report any incidence of breakdown of law and order to the appropriate civil and military security apparatuses. Reported cases are also supposed to be intelligently collected, evaluated and investigated to a more conclusive and justifiable end. Evidences are collected, protected and properly examined before accused persons are charged to Law court and fairly prosecuted. Investigations are carried out without fear or favour. In fact, any attempt to prevent due process during crime investigation is in itself a crime and it is also punishable under the law.

Until recently, the process of reporting and investigating crimes in the society has been mainly manual. Individuals who have some complaints will work into any offices of the security agents (e.g. Police, neighborhood corps) to inform and write in statement issues that may need their attention. At these offices, the security agents will raise an incidence form and ask the reporter to fill some appropriate segments. The security agents will also ask some intelligent questions from the reporter and make notes of preliminary investigations. Evidences suggested will be noted and further investigations will be followed up and new evidences will be collected, evaluated and protected.

The advent of technology has opened new fronts of opportunities of leveraging on the diverse benefits of information technology to crime reporting. There are various technology platforms that have been developed to assist how crime incidences are reported, responded to and investigated. The technological applications have gone from telegraph, special radio communication, and dedicated phone lines to a more responsive and more pervasive technological application platforms (web and mobile software applications). Majority of the members of the society nowadays have mobile devices that can easily access the internet. This makes the web approach the most economical and open approach for reporting crime with a far reaching benefits and coverage. Although there are several efforts that have been made in this area around the world, there is still no popular and responsive platform for reporting crime in Nigeria. The few available platforms in Nigeria (e.g. Amebo, Linda Ikeji) are blogs and are not ultimately serving the goal of properly reporting, evaluating and investigating various crimes in Nigeria. A close thing to it is the respective platforms sponsored by Economic Financial Crime Commission (EFFC) and Investigation of Crime and Corrupt practices (ICPC); they provide avenues to report crime incidences but investigation and response are towards financial crimes. This platform does not include murder, battery or harassment incidences which are commonly reported at the local Police station than financial crimes reported at EFFC and ICPC combined. These institutions and their respective platforms are specialized in the area of financial crime and their activities are so secretive that processes and progress of investigations are not shared with other security agencies and the members of the public.

The available platforms are far below how technology could be harnessed to report crimes. The platforms are not popular and not very intuitive to use by common citizens. The platforms are unidirectional in the sense they do not have feedback for the members of the society. All these gaps have necessitated our interests for an ideal application that will address the limitations.

We are looking forward to developing an all-encompassing web platform that reports all manners of crimes, open to all members of the public, suggestive (search for entities), interpretative and enlightening. The platform will provide a platform for various security agencies to share and gather evidences and mobilize members of the public for certain interests that will drive better policing, crime prevention and investigation.

We hope this project will address the gaps identified in the information space of crime reporting and investigation in Nigeria.

1.2 Statement of Problem

The notable crime reporting platforms are lopsided and not intuitive. The process of reporting crimes to security agencies still remain very difficult. The platforms are also unidirectional in the sense that they do not have feedbacks for the members of the society. The existing platforms do not support sharing of relevant information with other security agencies, thereby because owners of these platforms wants to take all the praise; while in actual fact security is being reinforced when meaningful and relevant information is shared among security stakeholders towards offering an excellent service. All these make our justice system questionable and irresponsible.

We propose an all-encompassing platform that will practically address ego issues among security agencies, give feedbacks and strengthen the overall security service and existing security apparatuses.

1.3 Aims and Objectives of Study

To develop a web application that demonstrates that the process of reporting, evaluating and investigating crimes in Nigeria should not be tortuous and that the model can be adopted for designing newer crime reporting platforms.

Our objective is to propose a system that caters for reporting all kinds of crimes, gives feedback and sustain the process of crime investigation and correction.

1.4 Scope of Work

We will design a web application that will provide a platform to report all manners of crimes. We will also provide a platform for different security agencies and their representatives to be registered; with a dashboard to view and interpret different report incidences. The general public will also be able to freely report, get feedback and evaluate progress of reported cases without

fear or intimidation. The application will be data driven and user experience will be responsive and consistent.

The applications will be accessible over the internet on computers and other mobile devices. No other hardware resources will be required and the evaluation will be mainly experimental.

1.5 Project Development Methodology (Agile Software Methodology)

Agile-Scrum Software Model

Agile software methodology is a set of repetitive and incremental process models. It is considered to be most flexible and easily maneuverable for skittish requirement specifications environments. Unlike other process models where high formality is required and the specifications are expected to be known and verified before the commencement of design, Agile models allow the use of increments or possible prototypes that can evolve into a more suited and validated requirements and eventually software application. Pressman (2004) defines it as a development pattern that encourages customer satisfaction and early incremental delivery of operational software; small, highly motivated project teams; informal methods; minimal software engineering work products; and overall development simplicity.

There are several evolving Agile process models for different design scenarios which are considered flexible, incremental and repetitive in approach. For this project, we would be using SCRUM Agile process model because of its support for object oriented software design. Pressman (2004) noted that Agile process models are not completely independent of the traditional process models; in fact most of the Agile models are flexible derivations or variations of the traditional approach.

SCRUM Process Model

It is an Agile process model which follows these activities: requirements, analysis, design, evolution and delivery. Scrum emphasizes the use of a set of software process patterns that have been proven effective for projects with tight timelines, changing requirements and business criticality. A prioritized list of project requirements or features that provide business value for the customer is made and it's called **Backlog**, work units that are required to achieve a requirement defined in the backlog that must be fit into a predefined time-box are also made and it's called

Sprints. Short **meetings** held daily by the scrum team would also be conducted, a team leader also called the **scrum master** who leads the meeting and assesses the responses from each person. **Demos** are also done; which is a software increment to the customers so that functionality that has been implemented can be demonstrated and evaluated by the customer.

1.6 Motivation

The new campaign aimed at fighting corruption and sharp practices in Nigeria has been our motivation. We want to demonstrate an ideal model that can be adopted to assist crime reporting and create a healthy thinking and attitudes among Nigerians.

1.7 Project Outline

Chapter two is dedicated to literature review on successful models for crime reporting platforms. Chapter three contains the research methodology and other software artifacts for the proposed model. Chapter four is dedicated to the technical implementations of the methodologies outlined in chapter three and chapter five is the conclusion and recommendation for future works.

Chapter Two

Literature Review

2.1 Crime

Well and meaningful societies in the world frown at crime and any social vices that undermine the collective safety and values that have been adopted in that society. Crime persists as long as human society exist, therefore there is a continuous effort and legitimacy to report, investigate and provide convincing evidences to prosecute individuals who perpetrate any criminal activity.
The word Crime originated from the Latin word Crimen dubbed charge or offence. Shodghangha (2011) projected Crime as a function of the adoption of standards by the society rather than individualistic standards, that is, the society gradually determine what is perceived as good value and bad acts and proscribe possible consequences. Tappan (2001) defined Crime as an intentional act in violation of criminal law which is without an excuse. Sampson et.al (1993) also defined Crime any act or omission that is forbidden by law that can be punished by imprisonment and/or fine after due hearing in a law court. Elizabeth (2003) expressed a holistic definition of Crime as an act that is not just harmful to some individuals but also to the state or general public.

The determination of what is obnoxious or sane is determined through a long and continuous complex interactions and reactions among members of a society. As society varies so what is considered as crime varies from people to people. Wilson et.al (1985) argued that there cannot be a general theory to define Crime for all societies because of the diversity of human society and culture. More so, Gottfredson et.al (1990) and Sampson et.al (1993) had a different view, stating that differences in cultures and societies do not really matter but the common characteristics in cultures can be identified and a general theory can be formulated to prescribe what the society should adopt as a crime, that is criminologist should not isolate crimes but to look for the commonality in crimes so as to propose a general rule to determining Crime for all societies. The dynamism of culture and unpredictability of human make it unlikely to have a general set of rules for all human societies.

No continent is left out; Ukoji et.al (2016) reported that Africa is considered a flash point for high crime. He noted that giants of Africa like Nigeria and South Africa now have high records

of violent crimes in recent time. America also has high crime index while some places in Europe have been able to crime index by few digits.

Another important component of the justice system is the crime investigation and prosecution. The general knowledge of what Crime constitutes is not enough without ultimately punishing the offender to serve as deterrent and freeing the falsely accused persons in such occasions. The general justice system constitute the laws; which indicate what Crime is, the law apparatuses like security agencies, people and processes that are followed to implement justice. The people who are to be served by the justice system may soon begin to lose confidence and underreport or result to jungle justice to redress their anger if existing justice system continues to fail with time. Criminal justice system also constitute the system of practices and institutions of Government directed at ensuring social control, deterring and mitigating crime or sanctioning individuals who violate laws with criminal penalties and rehabilitation efforts.

However the perception of criminal justice system in Nigeria is usually put in poor light because of rapid and failing structures of the justice system. Tosin (2016) reported that Amnesty international has always rated Nigeria justice system poorly and it is represented as a conduit for injustice from start to end. The actors in the justice system have also not helped the situation to start acting as expected by the lofty positions they hold and the important role they play in the process of dispensing justice. There is a sentiment about law makers having vested interest thereby making inadequate laws that do not really server the interest of the general public. The judicial system is also almost compromised as judges are bribed to pervert justice and dah the hope of the common man. Components of the justice system vary for different societies.

The process of the justice system is very important as it determines if the people who are served will accept the outcome of the process and continue to support the system. An important aspect of the justice system is being able to report cases, investigate and prosecute based on laws and get sentencing. Until recently, most communities report crime incidences on papers, which make the process vulnerable to alteration, theft; mutilation and erase of evidences that could have made the system apportion justice appropriately. With the advent of information technology, crime reporting has taken a new turn, has many cases can be reported independently and security agencies can easily access them and act promptly. There are state and individual sponsored ICT platforms for reporting, investigating crime and giving feed back to the people. The manual and

old process does not engage the people as anticipated which has gendered all sorts of perception about how professional and sincerely reported cases have been investigated. United States of America has a common database for reporting crime incidences which has improved policing in the US.

The few electronic platforms for reporting crimes in Nigeria are isolated and not been visited by the Nigerians majorly because of the distrust towards the process of justice, no feedback on reported cases and isolated crime reporting (mainly for financial crimes). There is a need to increase the awareness of an encompassing electronic platform that will accommodate all crime incidences, open to all and does feedback to the members of the public. This strengthens our legal infrastructure and justice system.

2.1 Types of Crimes

Otwin et.al (1995) reported that long-term trend shows a steady increase in all crimes, with some fluctuation from year to year. Crimes have increased nearly threefold since 1960, the year Nigeria gained independence. A decline was however noticed in crime between 1967 and 1969 which may the consequence of the Biafra civil war. More so, crime data were not a high priority, and some of the most populous regions were in the secessionist areas and did not report at all.

State	Crime	Number of Occurrences	Number of Fatalities
2015			
Lagos	Rape	2	2
	Drug Trafficking	1	
	Cultism/Murder	3	
Plateau		1	-
Ondo	Rape, Kidnapping, murder	3	1
	Bank robbery	-	-
	Currency counterfeiting	-	-
Edo	Robbery	1	5
Bauchi	Robbery, Ritual murder, Kidnapping	1	-
Kwara	Homicide	1	-
Taraba	Homicide	1	-
Abia	Homicide	2	1
Imo	Homicide	1	1
2014			
Lagos	Rape, murder, drug trafficking	7	7
Kaduna	Murder	1	1

Ogun	Rape, Ritual	4	19
Bayelsa	Kidnapping	2	1
Oyo	Robbery	1	2
Imo	Assassination, Arms	1	2
Zamfara	Proliferation	1	1
Osun	Murder	1	1
Plateau	Assassination	2	9
Ekiti	Murder	1	1
Bauchi	Rape	1	-
Kogi	Rape	1	-
2013			
Ebonyi	Child trafficking	1	-
Lagos	Rape, car theft, ritual murder	4	-
Abuja	Fake UN recruitment	1	-
Akwa Ibom	Child Trafficking	1	-
Total	Event	47 Events	54 Fatalities

Table 1: Crimes committed in States, by number of incidents and fatalities (Adapted from Ukoji et.al (2016)).

States	Armed Robbery	Cultism	Kidnapping	Rape	Domestic Violence	Assassination/ Thuggery/ Hooliganism
Abia	107	12	53	3	5	6
Adamawa	54	18	-	-	2	2
Akwa Ibom	66	64	15	9	11	9
Anambra	225	64	36	4	19	9
Bauchi	37	2	7	1	13	42
Bayelsa	16	104	14	6	7	5
Benue	144	67	3	9	16	28
Borno	46	-	20	-	9	9
Cross River	28	40	5	1	14	5
Delta	946	202	55	7	52	32
Ebonyi	35	16	5	4	24	16
Edo	109	306	15	10	32	12
Ekiti	47	20	2	5	11	6
Enugu	72	58	6	5	13	10
FCT	78	5	3	3	13	4
Gombe	13	-	-	-	2	3
Imo	104	47	25	5	20	23
Jigawa	18	-	1	-	5	1
Kaduna	44	-	4	6	12	9
Kano	49	-	4	-	14	11
Katsina	24	1	3	-	7	5
Kebbi	18	-	-	-	-	10

Kogi	66	17	12	-	18	26
Kwara	63	57	3	-	14	19
Lagos	819	323	40	34	121	172
Nasarawa	71	35	2	2	8	-
Niger	22	7	1	1	14	2
Ogun	184	99	11	9	29	32
Ondo	98	20	11	6	20	10
Osun	50	7	9	4	13	17
Oyo	149	4	14	4	27	67

Table 2: Crimes fatalities in Nigeria between June 2006 – September 2015(Adapted from Ukoji et.al (2016)).

Otwin et.al (1995) classified crimes in Nigeria into three:

(a) Normal crime
(b) Political- economic crime
(c) Riotous

2.1.1 Normal Crime

Normal crime includes criminal acts such as theft (kidnapping, shoplifting, armed robbery etc.), assault (e.g. rape, murder, manslaughter etc.), and homicide. Data on these crimes are published by the Nigerian police in annual reports which appear occasionally. However Bennett et.al (1990) and LaFree (1985) warned that reports coming from crime statistics should be treated as suspect because of inadequate and well-documented failures in reporting, recording, and collating procedures.

Ekpenyong (1989) and Nkpa (1976) also reported armed robbery crime is significant among other crimes and has occurred throughout Nigerian history. It has become increasingly violent, however, following the civil war for two reasons: (a) criminals were able to buy or steal weapons from the military, and (b) some demobilized and unemployed soldiers who had few legitimate prospects after the war ended were enticed into using their military skills for illegality. Although the actual number of robberies are few, when they occur they are dramatic and heavily reported in the national media.

More recently kidnapping, murder and sexual assault have reached a crescendo. Jobless youth and former service men have been confirmed to be main culprits on most arrests and they confessed to have found these three criminal acts very financially rewarding. Civil societies and elder-state men have called on the three tiers of government in Nigeria, to step-up and fix the

lingering socio-economic problems facing the nation especially, the youths. Among these crimes, kidnapping has raised fear in many citizens of other friendly states, who usually travel to Nigeria for business opportunities and tourism. There is also a drop in attendance of foreigners who attend our cultural, spiritual and other social events for the fear of the unknown.

For instance, the insurgence in the north eastern part of Nigeria and restiveness in the south do not affect beautiful and economic capital like Lagos, in the western region. In fact the government of Lagos is very visionary and it is planning to give Lagos, a mega city status. There has been serious development in terms infrastructure, human capital, power, recreation, youth engagement, environmental management and security.

2.1.2 Political- economic Crime

Political and economic crimes exist at all levels in Nigerian society and take different forms. Odekunle (1986) separates this category into Elite and working-class crimes. He classifies the elite crimes into white-collar (e.g., embezzlement, tax fraud), political and economic corruption (e.g., illegal patronage, vote buying and/or kickbacks), and organized crimes (e.g., hoarding, smuggling, burglary syndicates). Working-class

Elite-crimes. Nigeria, as is common with most developing countries, must import many consumption and economic investment goods from developed countries. The dependence on importation opens the doors for corruption, fraud, and economic, elite white-collar crimes for both Nigerians and foreigners. Foreign companies often sell secondhand goods as new, sell shoddy goods they cannot sell at home, 6 overstate the price of goods, and understate the profits they attain to lower the tax they must pay for doing business in Nigeria. These activities require the induced cooperation of Nigerian nationals-their signatures are needed on import permits, sales contracts, consultancy assignments, and directorship appointments. Forrest (1993) also confirmed the collaboration between foreign companies and local officials such that these foreigners are willing to pay for access to profits, and find Nigerians eagerly in pursuit of personal wealth. Investigations conducted by the Nigerian government have revealed that such payoffs can be in the hundreds of millions of dollars. Diamond (1984) cites many instances of fraud, theft, and bribery during the 1978-1982 periods, all of which were discussed and condemned in the media.

Elite political crimes take many forms as well. A military coup, technically, is a crime, and people killed in the process are homicide victims. There is no legal basis for taking over the government by force. Of course, once the military is in power, it does not punish its members. Many Nigerians also believe that the military's actions, despite the justificatory rhetoric it promotes over the airwaves, are done largely for economic gains-by the organization to protect its share of the budget and by individuals to gain access to corrupt opportunities.

Other forms of political crime are fraud and violence during election campaigns and the use of state power for political ends (e.g., the use of police and other security organizations to arrest and detain critics of the government). The contest to control the government, since it is the largest source of legal and corrupt income is intense and leads to considerable fraud, manipulation, thugery, and violence during electoral campaigns, during the vote counting, and as the results are announced. This is true of all elections to date. In some instances (e.g., the 1965 and 1983 elections in the western states), conditions were perceived to be out of control and to maintain order was beyond the powers of state agencies

Ihonvbere (1994) reported that government sometimes sponsor repression against her own, despite assertions to the contrary, it is fairly rare. Most serious are the occasional political killings carried out by the police and the military. Usman (1982) stated that the evidence of government's involvement in a particular episode is often contested and vague, even when widely suspected and debated in the public life. Two prominent examples are the assassinations in 1986 of a popular news magazine editor, Dele Giwa, by a letter bomb delivered to his home, and the suspicious death of Dr. Bala Mohammed, the senior advisor to the governor of Kano State during the riots of 1981 and late Chief Funso Williams; a governorship aspirant in Lagos State.

2.1.3 Riotous Crime

The last major form of crime is riotous crime. Gurr et.al (1971) reported that acts are carried out during riots, which, if done at other times, would be considered crimes. People are assaulted, injured, and killed; property is destroyed; practically every order-maintaining regulation is broken. Most scholars label such events turmoil or civil unrest. As individual acts, however, they also are crimes. Riots occur for many reasons, which shift over time. Armed confrontation over land claims between villages often leads to fighting, injuries, deaths, and massive police and

military intervention in an attempt to restore order. Riots also occur between followers of political parties and leaders during campaigns or after elections when fraud is suspected. Occasional confrontations between the military personnel and local people can lead to large-scale fighting. Over hundred Religious riots between Moslems and Christians have led to extensive property damage and hundreds of deaths in recent years. Radicalized individuals burn Churches and mosques, destroy shops and homes owned by (suspected) adherents to the other religion, and murder those who resist. Such actions lead to retaliation by the other side. Mob action also provides a cover

Riots by students protesting conditions at their universities or in the country occur with predictable frequency and great regularity, usually in the months of April and May when students organize remembrance marches for students killed in past demonstrations. Student demonstrations attract the attention of the police, fighting and rioting ensues, students and innocent bystanders are injured and killed, and property is destroyed. Carter (1980) observed the trends in how university authorities react to sympathy demonstrations at other universities. Once order is restored, student leaders are expelled or rusticated, the universities are closed for a cooling off period, and everyone passes around blame for that caused the latest confrontation and destruction.

Riots are frequent in most parts of the country, especially in the north. There are more religious riots in the north than in the south, while there more socio-economic based riots in the south than in the north.

2.2 Factors Leading to Crime

Sampson et.al (1993) and Blau et.al (1984) reported that the Sociologists have confirmed that crime occurs in the social structure only. Most Sociologists disagree that human beings are naturally criminals by birth. They also evidently identified some social factors which drive human beings towards criminality by going against the system of social control. Criminologists also agree with Sociologists on the likely factors leading to crime. Hence, while studying, the reasons for crime, the following factors should be considered. There are two groups of factors leading to crime

(a) Ordinary factors
(b) Specific factors

2.2.1 Ordinary Factors

These factors affect the entire society. Generally these factor are classified into four secondary factors: geographical, sociological, physiological and atmospheric.

2.2.1.1 Geographical

Singh (1964) expounded that by geographical factors, we mean those factors which are connected with physical environment. Our immediate geographical settings govern the form of society. Different places of different culture and civilization do have different geographical regions. The composition of population is closely connected with geographical conditions. Similarly diet, habits and social organization always develop in accordance to geographical conditions. Therefore a change in our physical setting may give rise to change in society.

Martin (2011) reported that Mr. Ellsworth Huntington was a staunch supporter of the school of geographical thinking, and he believes that a child born in winter usually becomes less intelligent. Some of such children become criminals. The geographical elements affect the emotions and behavior of an individual. Many notable German, French and Italian criminologists have proven to show the relation between the components of geographical elements and the proportion of crimes.

2.2.1.2 Sociological

The number of crimes increases or decreases depending upon how far a society or a community is organized or divided. In a social group where migration, cultural differences, changes in the population and political instability prevail; there a conflict arises regarding the abatement of social rules.

2.2.1.3 Physiological And Atmospheric

Jennifer (2010) reported that Dugdale an American criminologist stated that the life style of every human being is affected largely by the hereditary qualities. Hence, the consequent circumstances of hereditary qualities cause the future generations to be criminal minded continuously.

Some psychologists say that criminal behavior has its roots in the psychological set up of an individual. During the gradual psychological development of an individual some mental weaknesses take shape. These weaknesses become the causes of criminal behavior. Mental instability and criminality are closely related. Some psychiatrists have tried to correlate criminality with the abnormality in the nerves. Disappointment, conflict, feeling of criminality, mental shocks etc. one related with the human mental activities and they become responsible for the criminal behavior. Sociologists, Psychologists and Psychiatrists have deeply studied of human behavior. These stimuli are created from eternal circumstances.

2.2.2 Specific Factors

There are also some specific factors that are related with the criminality of human beings. We present the following circumstantial elements

2.2.2.1 Family Circumstances

The family is the building blocks of any society. The values upheld by families have a powerful cause of forming good or bad personality developments. The very important task of a family is to socialize an individual and to impart social rules and to develop the individual culturally, so that the individual becomes a responsible citizen. But, under certain circumstance some families fail in their responsibilities and some members of these families turn out to become criminals.

2.2.2.2 A Ruined Family

Divorcement ruins a family. The members of such a family may turn towards criminal activities, because either of the parents may begin to be complacent and members of the family are left to have their ways. This has been proven from various surveys.

2.2.2.3 The Size of the Family

The size of the family matters. There has been correlation between criminality and family size. More members make a big family and fewer members make a small family. Usually in a big family where there economic pressure there may be difficulties regarding provision for food. Usually in large families, children are neglected and such neglected children tend to become criminals. The correlation between criminality and family size is still being hotly debated. Still, in the urban areas, children in the big families generally turn to criminal behavior.

2.2.2.4 Discontentedness in the Family

Favoritism among members of the family might push some members to seek affection and care elsewhere. Such a member of the family may turn to criminal activity for respite. Some members of the family are naturally insatiable thereby creating unreasonable behavior, rivalry in the family then the members of the family especially the children behave in a dissatisfactory manner. From this, the criminal attitude arises.

2.2.2.5 Fallen Family

When a member of the family who has great influence on the rest chooses to toll the unethical way such drinking, extramarital relations, polygamy and criminality, the atmosphere is no longer the same. The family is not moralistic and such a family is known as a fallen family. In such a family, criminality of individuals or specially children is very probable. Such a family is unable to impart civilized life or behavior.

2.2.2.6 Absence of Orderliness in the Family

The most important duty of the family guardians is to be attentive towards the socially acceptable behavior of individuals and children in the family. They don't find time as they are involved in their own duties. Further, they don't have desire or they are ignorant and they have undue or over belief in their children. Whatever be the case, if the guardians don't care for the proper behavior of the children, then they will certainly turn towards criminal behavior.

2.4.2.7 The Movies

Uncensored movies have been proven to have significant impact on families, especially children. The cinema houses have become the centers for breeding criminal behavior in minors. That is why, it is necessary for parents and sane adults to censor what younger members of the family are allowed to watch on Television and at the cinemas. Responsible adults must understand that younger members of the family are to be protected and nurtured in the best possible upbringing.

2.4.2.8 Financial Conditions

Harsh economic conditions may drive a member of a family to criminal activities. Such members of the family may begin to hang out with their pairs who could help them and consequently will

have great influence on them. Monitory conditions are taken to be crime breeding reasons in many ways. Van (1955) also reported that AdrianBonger, a Dutch criminologist proposed that the atmospheric elements are more responsible for criminal activity, that the criminal activity is abundant in a disorganized society. In societies in which the important regulations are broken, the criminal activity forms a firm background.

This proposition is not absolute for all individuals in disorganized societies, some individuals are found to stay free from criminal activities. And in well-organized societies, some individuals may turn to criminal behavior, but there exist significant evidence that links criminality to disorganized societies, than the organized societies.

2.4.2.9 Regional Variance

The main causal factor of criminal behavior is the structural variety in the society, though there is a difference in definitions for judicial and social aspects and it varies from state to state. There are different laws in different areas and they are implemented to control the behavior going against lawful life of a community. The traditional life of communities too tries to curb the criminal behavior that is less civilized societies that hold in high esteem traditional values tend to have less crime compared incidents compared to civilized ones.

In cities we find more crimes and child criminals, because of the instability in communities and the expected moralistic behavior is not extant everywhere. In the deep inner parts of a corporation however the proportion of crime per head decreases. Hence, regional difference shows variant proportion of crime. It is interesting to note that in areas where there is abundance of finance, facilities and conveniences, we find more criminal behavior. Where as in areas affected by natural calamities, scarcity and epidemics, we do find crime but in lesser proportion.

Reiss et.al (1993) and Land et.al (1990) affirmed that cage, gender, race etc. affects the criminal tendencies. For example, the difference of social status in a community might trigger criminal behavior, and such people come under legal procedures. It is also reported that as this class of people grow in age, their criminal tendencies also reduces. Sampson et.al (1990) reported that studies showed correlation of male gender with higher criminal attitude than in female gender and this might be owing to fact that different communities have different views towards women. Generally, the disciplinary control over women is stricter. Further, women have limitations by

nature over their physical conditions. They are weaker thus needing protection. Racial or national influence is found on criminality, especially, in a heterogeneous society. In a Nation, the outsiders are given the status of minority and they are looked upon differently regarding criminality. These minority people have different problems to face. Thus, age, class, gender and race have been proven to have impact over criminality and they are important in view of crime study

2.4.2.10 Religious Radicalism

There is increase in religious radicalism in Nigeria and around the world. The emergence of deadly islamist radical groups like ISIS, Alqeda, Taliban, Boko Haram etc., have made the world very unsafe in the last ten years. These groups now make use of social media platform to spread their wicked ideologies to suggestible minds. They tend to present themselves as the mouth piece of God for their religions and then bring in hate speeches and murderously incite listeners to take revenge or corporate with them, because God has promised better reward in this life and especially in the word to come.

2.5 Electronic Crime Reporting Platforms

E- Crime reporting platforms have become very popular in the more civilized societies. They have made reporting accessible, easier, verifiable and reliable. Somehow, they have also made crime reporting faster and cost effective. However in Nigeria, the reverse is the case. Most of the government security agencies still find it difficult to investigate crimes to a conclusive end.

Many crimes are still not been investigated and reported timely because of the bureaucracy in finding attention at the police station. Security agents are not always accessible and the process of being given attention is very discouraging and time wasting. The perpetrators still continue their escapades with impunity and disdain to the victims.

Smitt (2016) reported that the government of United States of America (USA) created a platform for the American public to report internet facilitated crimes. The office of the Attorney general confirmed that several millions of Americans fall victims to cyber related crime but barely fifteen (15) percent report the incidents. Having the interest of the people at the core of their service, federal bureau of investigation came up with the idea of an E-cyber reporting platform (ic3.org) to make the members of the report any incident and assist with any information that could make

them server them better. The platform also has explains first precautionary steps to be taken to mitigate against loss once a compromise of their property or privacy is noticed; such as blocking bank accounts, visiting the nearest FBI office, or changing users' password. Another beautiful side of this application is that it allows users to get feedback and joggle with information available to the public in read-only mode.

The criminal service justice division of FBI also rolled out an all in-one platform for the security agencies to report, collate and investigate all sorts of crime. The platform consists of all templates used by security agencies to report and investigate crimes, but the downside of it is that it not meant for the public consumption. The platform has a maker-checker like control. Normally, when a junior officer reports an incidents the superior vets it and make corrections or append its signature, so this also plays out on the platform but making it inaccessible to the members of the public will definitely not make it attain if full potential.

2.6 Limitations of Existing E-Crime Reporting Platforms

We identified that there is still a gap in E-crime reporting to some extent in the US and by far in Nigeria. The IC3 and CrimeRMS in section 2.5 above are wonderful ideas but cross implementation concept could have been more beneficiary, i.e. CrimeRMS should have adopted the ideology behind IC3 where some managed information can be accessed by the members of the public.

Most E-crime reporting platforms suffer from these limitations; isolation (reporting only one aspect of crime e.g. IC3, EFCC and ICPC websites), absence of feedback (no feedback to the members of the public), and ego of ownership (the creator of such platforms wants to monopolize information thereby leading to poor security service such as we experienced between EFF and DSS on the arrest of Ayo Oke (former National Intelligence Agency, chairman) and Abdurasheed Maina (former Civil service pension boss))

There is a need to create an independent E-crime reporting prototype that will be all encompassing, open access to all and gives timely feedback as investigation proceeds.

2.7 Justice System In Nigeria

Tosin (2003) stated that the justice system in Nigeria is divided into Arrest and release, prosecution, court, sentencing and correction. Arrest is made after a report is lodged or an offender is caught on the spot. Interrogation and investigation are made to hold substance before being charged to the law court. The law court examines the case in all fairness and apportions justice based on the constitutions of the federal Republic of Nigeria. The correction is implemented by being sent for a jail term or capital punishment.

Chapter Three

System Analysis

3.1 Requirement Discovery

Requirements discovery is the most important activity in system software development activities. It consists of the activities involved in requirement engineering such as meeting the business owners for proper elicitation, planning, scoping and holistic management.

3.1.1 Problem Analysis

The prominent crime reporting platforms in Nigeria are lopsided and not intuitive. The process of reporting crimes to security agencies still remain very difficult. The platforms are also unidirectional in the sense that they do not have feedbacks for the members of the public. The existing platforms do not support sharing of relevant information with other security agencies, thereby because owners of these platforms wants to take all the praise; while in actual fact security is being reinforced when meaningful and relevant information is shared among security stakeholders towards offering an excellent service. All these make our justice system questionable and irresponsible.

We are poised to investigate the possibility of having an all-encompassing platform that will practically address ego issues among security agencies, give feedbacks and strengthen the overall security service and existing security apparatuses.

3.1.2 Fact Finding

Functional Requirement Specification

- ✓ The application should have an interface to capture and report all kinds of crimes
- ✓ The identity of the complainer should not be revealed
- ✓ Complainer must not be forced to register
- ✓ The application should be able to provide information of location
- ✓ Visitors should able to view high level summary of crime offenses

Non Functional Requirement Specification

- ✓ Registered users should get feedback
- ✓ The navigation should be intuitive
- ✓ The interface should be user friendly

3.2 System Requirements Modeling

This section captures the requirement specifications for the stakeholders.

3.2.1 Business Actors

The stakeholders are also known as the business Actors.

- ✓ Anonymous User
- ✓ Registered User
- ✓ Security Agency
- ✓ Super Administrator

3.2.2 Business Requirements Use Cases

SN	User Action	System
1	Signup	Accept registration
2	Report an incident	Generate a code for tracking progress
3	Check national crime indexes	Return appropriate text for the selected context.

Table 3: Use case statement for an Anonymous User

SN	User Action	System
1	Login	Validate Login details
2	Report an incident	Accepts report
3	Check national crime indexes	Return appropriate text for the selected context.
4	Deletion of incident report, if it has not been viewed or worked upon by the security agency	Commits changes

Table 4: Use case statement for a Registered User

SN	User Action	System
1	Login	Validate Login details
2	Administers permission	Commits changes
3	Check national crime indexes	Return appropriate text for the selected context.

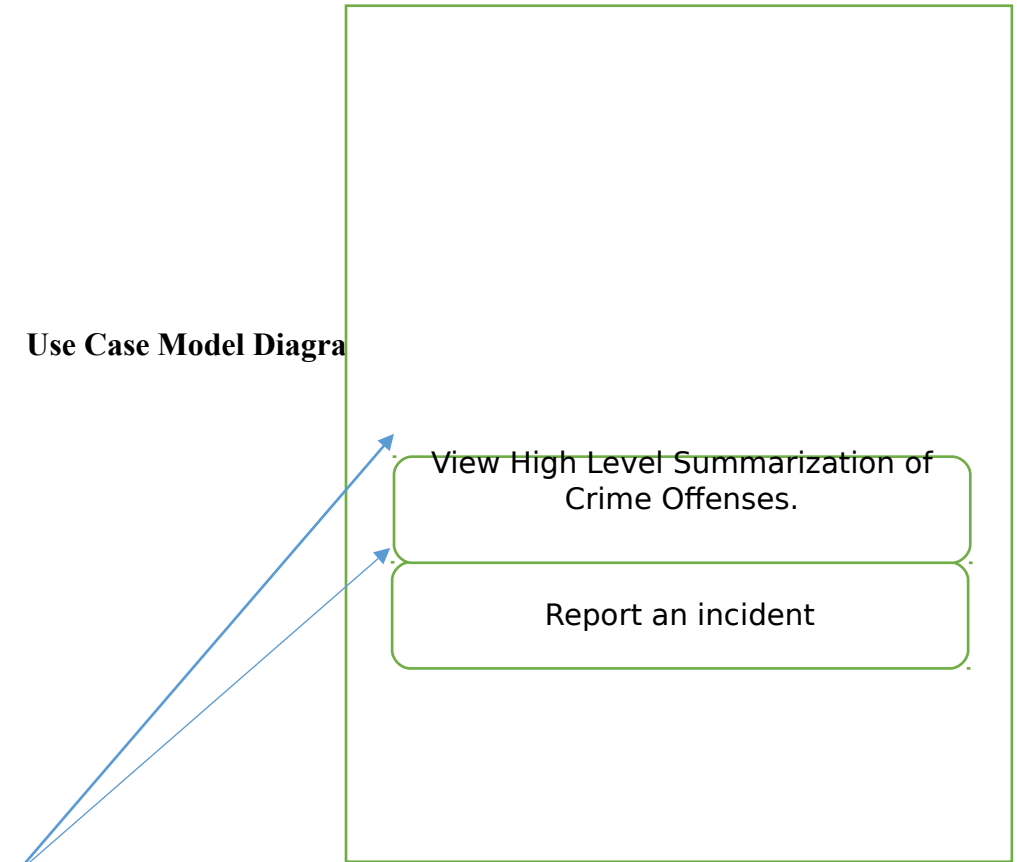
Table 5: Use case statement for a Super Admin

SN	User Action	System
1	Login	Validate Login details

2	Comment on reported incidents	Commits changes and gives feedback to users
3	Check national crime indexes	Return appropriate text for the selected context.
4	Close an incident	Commits changes and gives feedback to users

Table 6: Use case statement for a Security Agency

3.2.3 Use Case Model Diagra



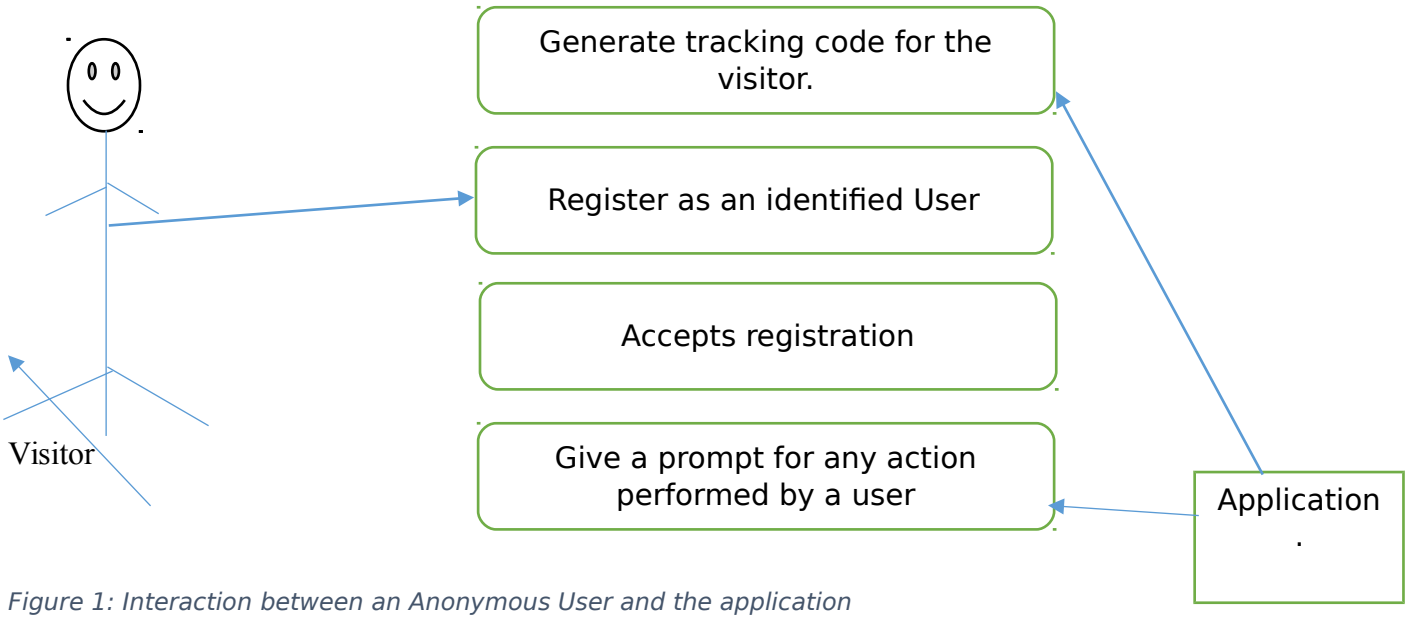
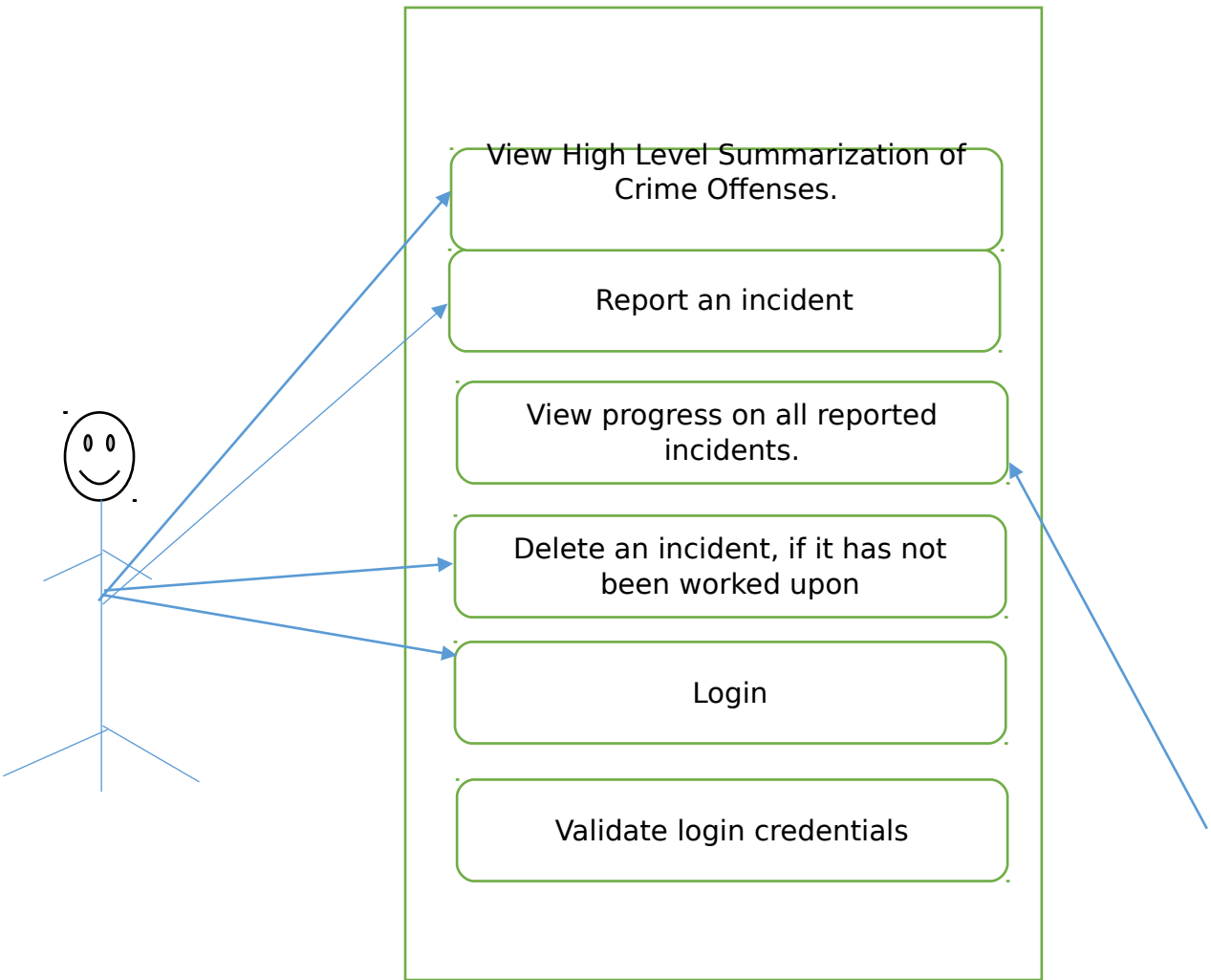


Figure 1: Interaction between an Anonymous User and the application



Registered Visitor

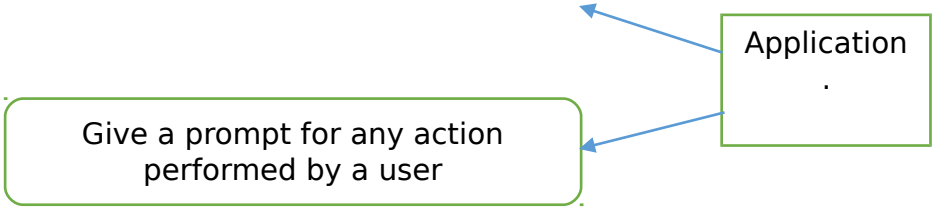


Figure 2: Interaction between a registered user and the application.

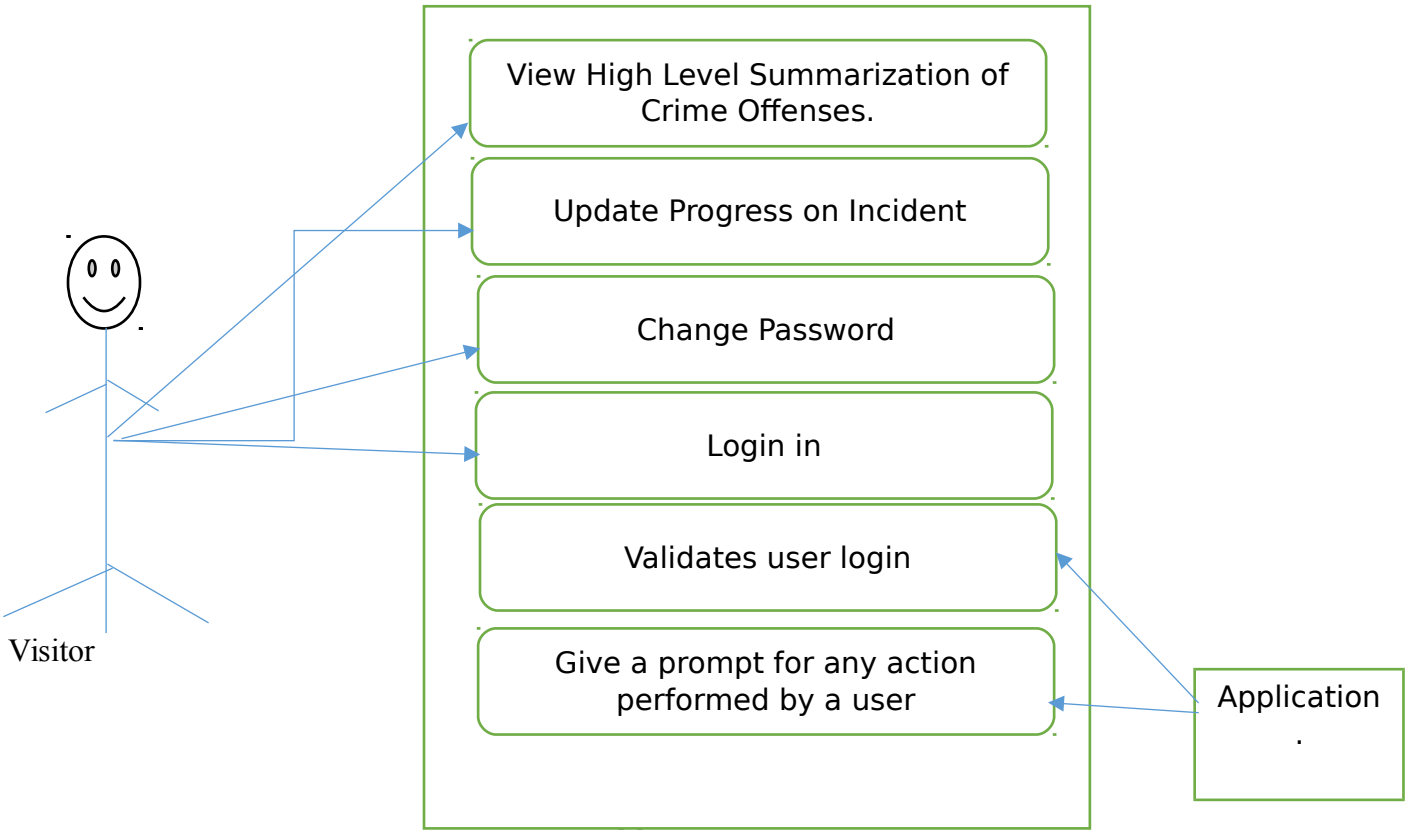


Figure 3: Interaction between a Security Agency and the application.

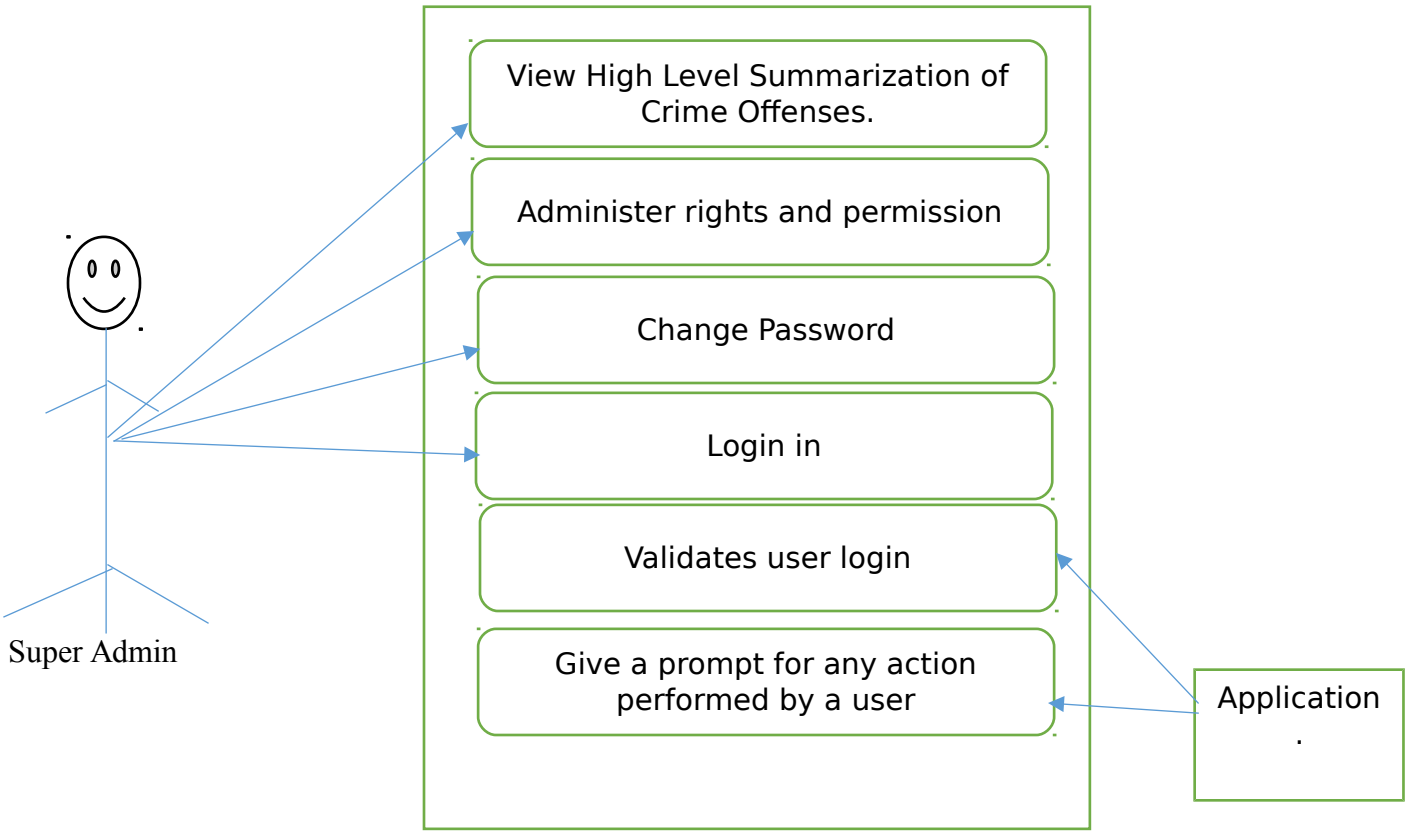


Figure 4: Interaction between a Super Admin and the application.

3.2.4 Use Case Dependencies

This refers to an action that is primary to a use case or options for actions that can be done in a use case. There are two types of use case dependencies: include and extend.

SN	Actor	Include Dependency	Extend Dependency
1	Anonymous User	✓ Submit an incident with concealed identity ✓ View crime indexes	
2	Registered User	✓ Login ✓ Submit an incident ✓ View crime indexes	1. Submit an incident with concealed identity 2. Submit an incident with identity known
3	Security Agency	✓ Login ✓ Writes feedback ✓ Close incident	
4	Super Admin	✓ Login ✓ Administers permission ✓ Compliance enforcement	

Table 7: Use case dependencies for the business actors

3.3 Data Modeling and Analysis

3.3.1 Entity Discovery

We have identified these entities as sufficient data objects to represent the solution to the electronic crime reporting problem.

- Incident
- Crime Type
- User / Visitor
- Location (State, Local government Area)
- Security Agency
- Gender
- User role

Please note that Crime type, gender, State, LGA, Security Agency and User roles have common attributes, thus they can be save in a generic table identified by setup categories. Each of these

entities will be setup as setup categories and their values will be saved in that generic table against a corresponding setup category code. So we replaced all these entities with two new entities: setup category and setup

3.3.2 Context Data Model

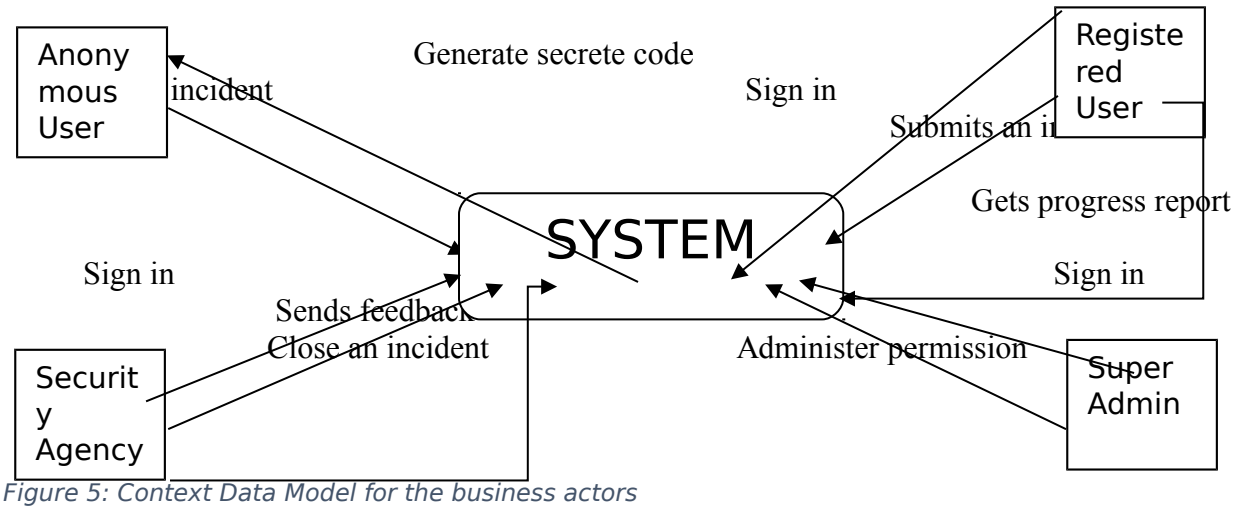
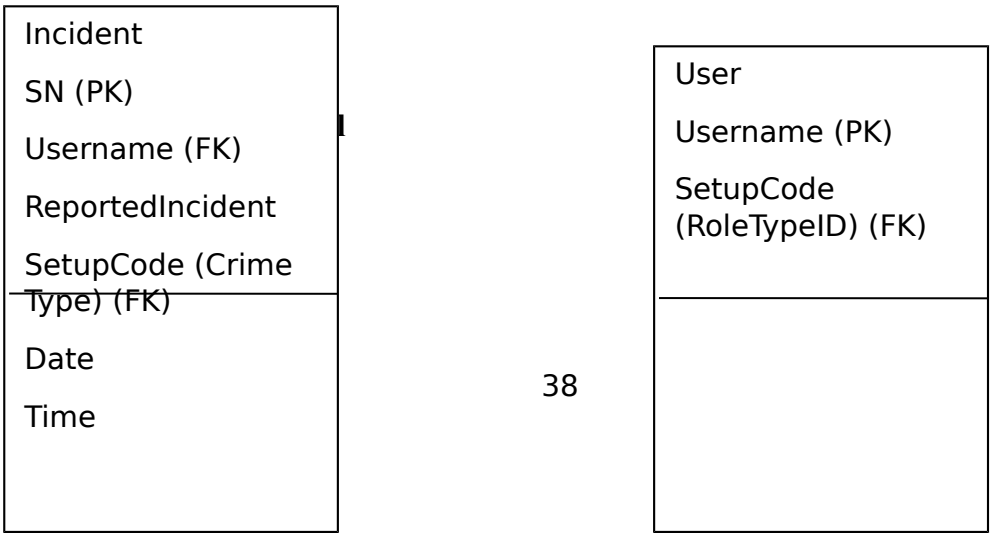


Figure 5: Context Data Model for the business actors

3.3.3



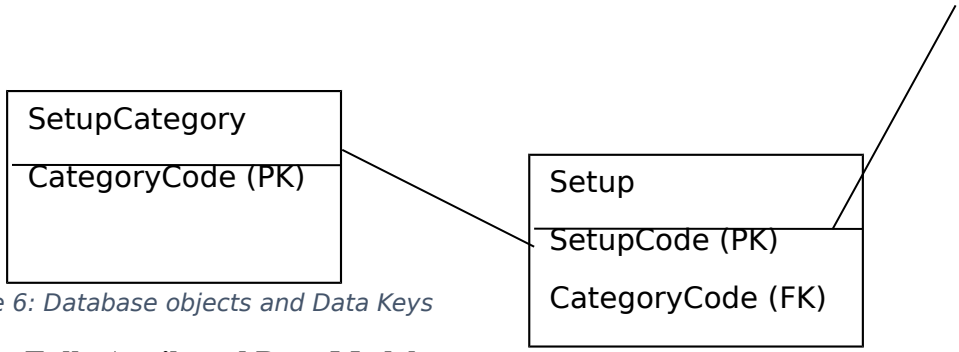


Figure 6: Database objects and Data Keys

3.3.4 Fully Attributed Data Model

S/N	FIELD	CONSTRAINTs
1.	CategoryCode	***PK***
2	CategoryName	Null

Table 8: Setup Category table

S/N	FIELD	CONSTRAINTS
1.	CategoryCode	***FK***
2	SetupName	Null
3	Description	Null
4	Remarks	Null
5	CreatedDtTime	Null
6	CreatedBy	Null

Table 9: General Setup table

S/N	FIELD	CONSTRAINTs
1.	SN	Null
2	FirstName	Null
3	LastName	Null
4	Gender	Null
5	RoleAccessID	***FK***
6	Phone	Null
7	Address	Null
8	UserName	***PK***
9	Password	Null

Table 10: User table

S/N	FIELD	CONSTRAINTs
1.	SN	Null
2	CrimeTypeID	***PK***
3	Description	Null
4	State	Null
5	LGA	Null
6	ReportedDtTime	Null
7	ReportedBy	Null
8	DeviceType	Null
9	DeviceTypeID	Null
10	MacAddress	Null
11	SecurityAgent	Not Null
12	ProgressNote	Null

Table 11: Incident table

S/N	FIELD	CONSTRAINTS
1.	RoleAccessID	***PK***
2	RoleTypeID	***FK***
3	AccessRightString	Null
4	CreatedDtTime	Null
5	CreatedBy	Null

Table 12: Role Access table

3.3.5 Class Diagrams

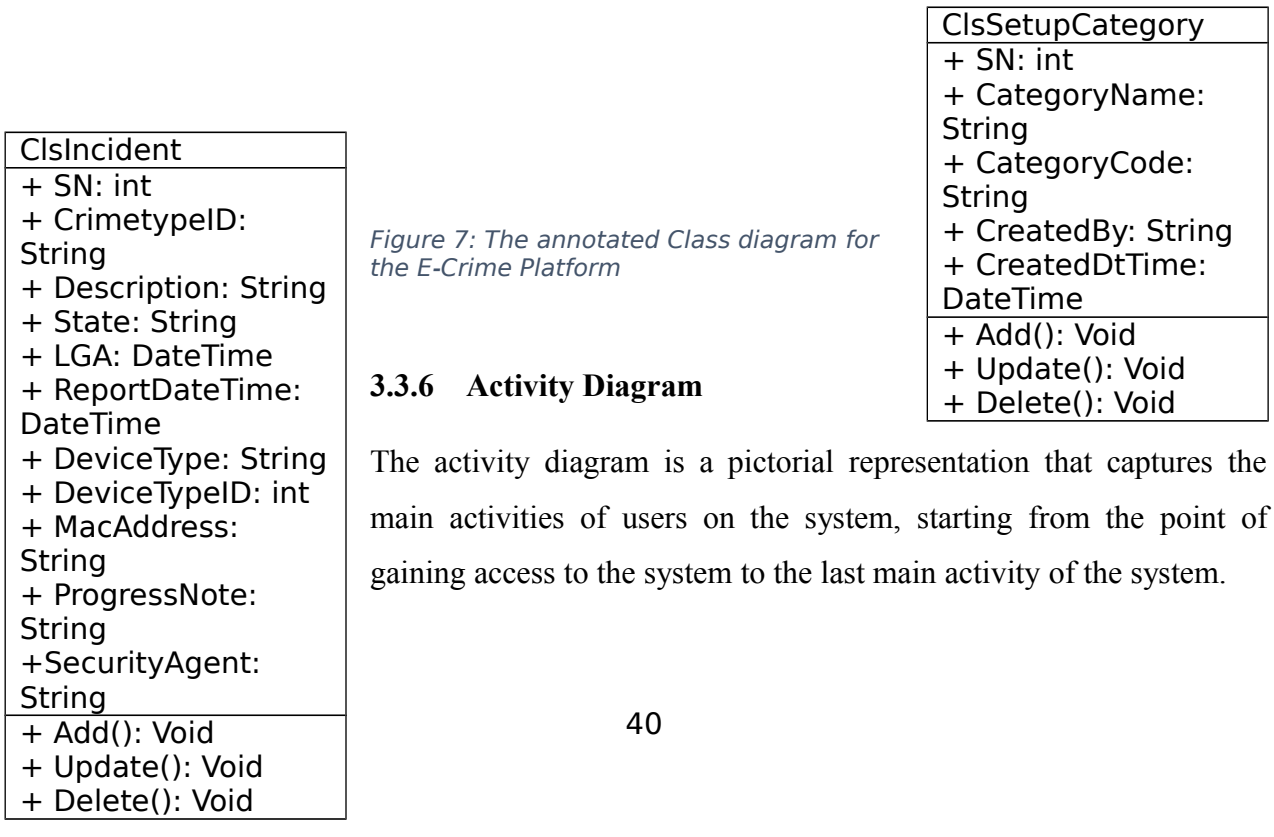


Figure 7: The annotated Class diagram for the E-Crime Platform

3.3.6 Activity Diagram

The activity diagram is a pictorial representation that captures the main activities of users on the system, starting from the point of gaining access to the system to the last main activity of the system.

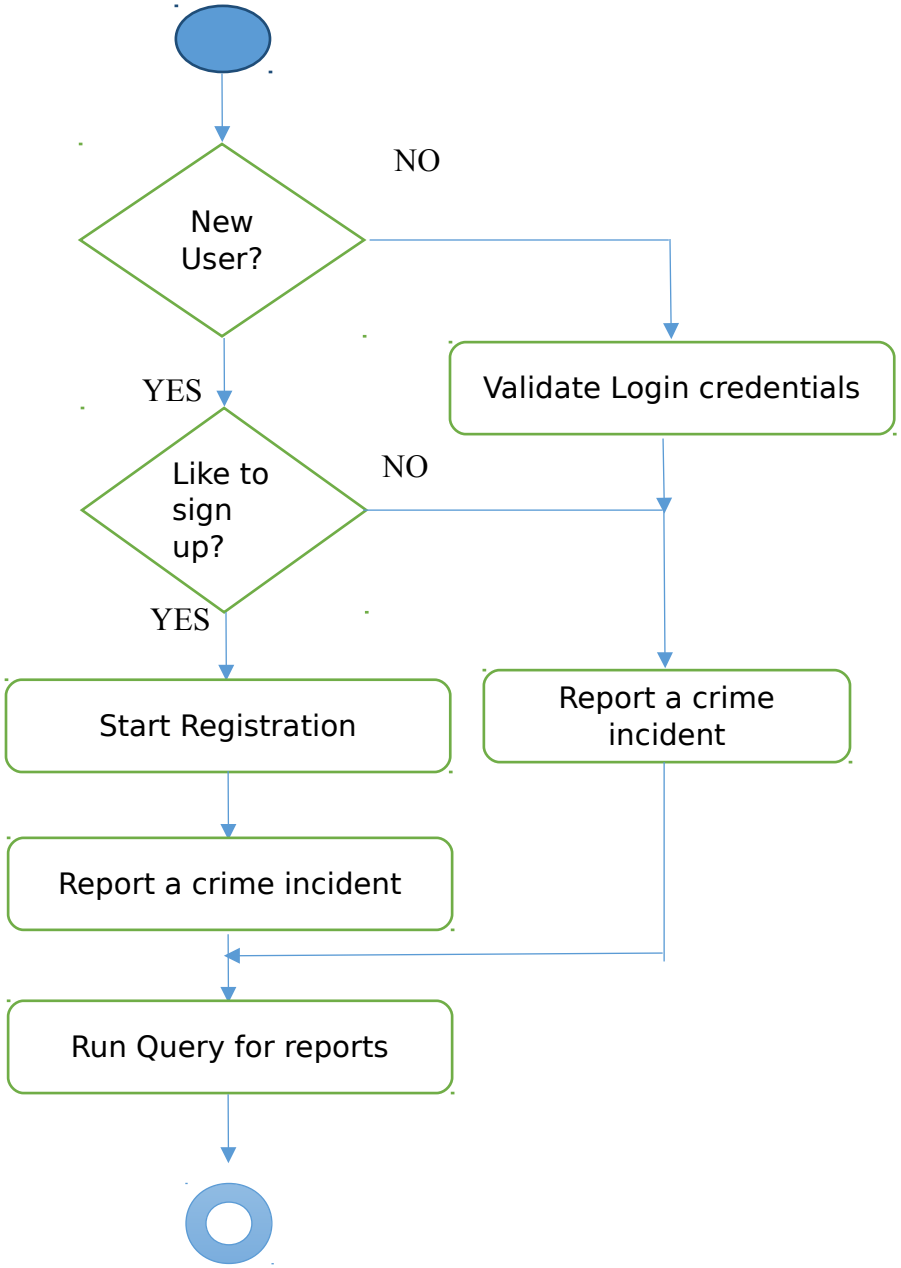


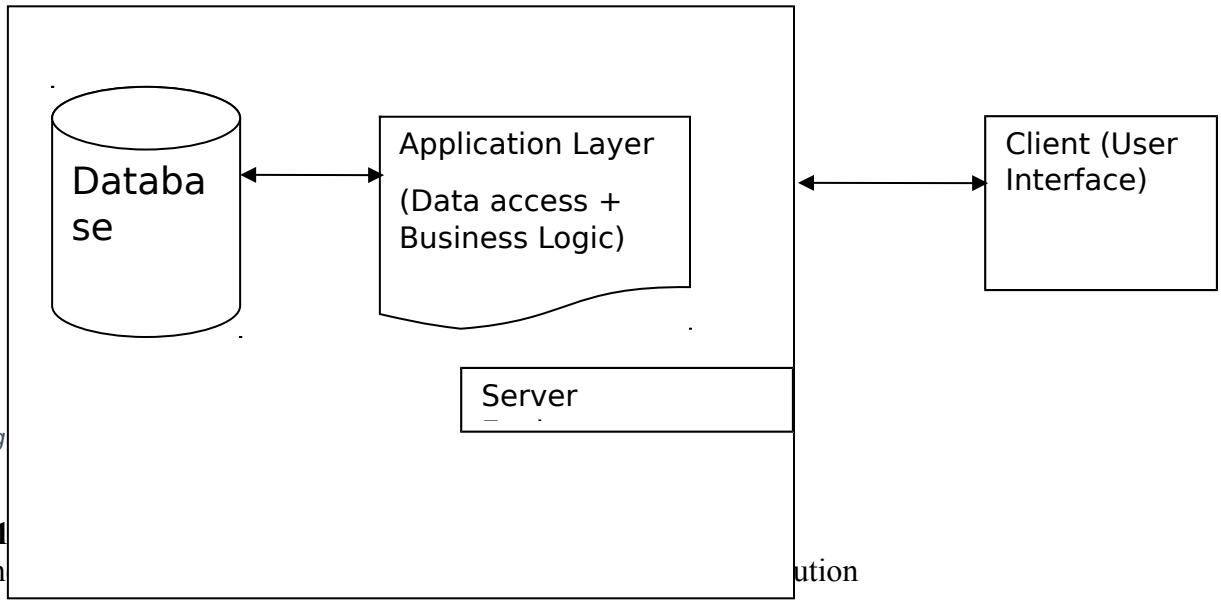
Figure 8: Activity diagram for the Proposed E-Crime Platform

Chapter Four

System Design

4.1 Application Architecture

The architecture for the proposed system can be found below



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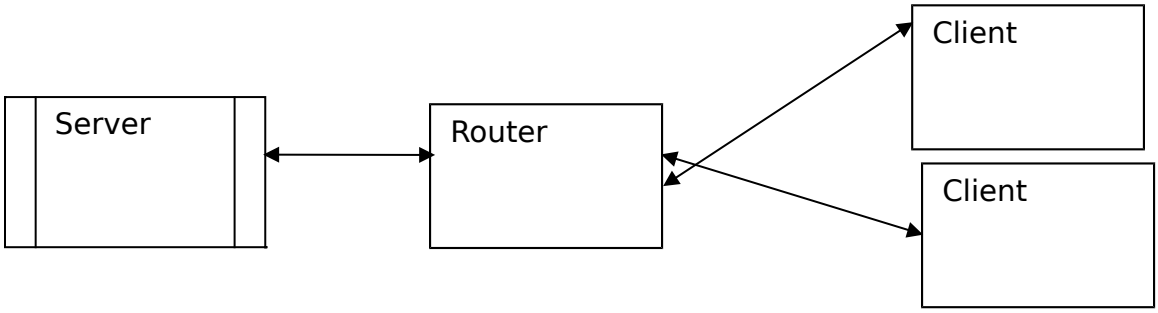

Figure 10: The Network Architecture for the proposed solution

4.1.2 Person-Machine Boundaries

SN	Person	Machine
1	Supply login credentials	Validate credentials
2	Select query context	Return query result
3	Submit an incident	Accepts incident
4	Update progress report	Accept changes
5	Disable/Enable User	Accept changes
6	Close Incident	Accept changes
7	Incident Submission by an anonymous user	Generate a secret code to track progress report

Table 13: Actors-Machine Boundaries

4.2 System Database

4.2.1 Database Schema

The database schema for the proposed solution is represented as the following:

S/N	FIELD	DATA TYPE	FUNCTION	CONSTRAINTs
1.	CategoryCode	Varchar(20)	Store mnemonic for the created category	***PK***
2	CategoryName	Varchar(50)	Store the category identity	Null

Table 14: A Schema for SetupCategory table

S/N	FIELD	DATA TYPE	FUNCTION	CONSTRAINTS
1.	CategoryCode	Varchar(20)	Reference a mnemonic for the created category	***FK***
2	SetupName	Varchar(50)	Store the setupname identity	Null
3	Description	Varchar(50)	Describe the function of the setup	Null
4	Remarks	Varchar(50)	Store the remarks	Null
5	CreatedDtTime	Datetime	Stores creation date	Null
6	CreatedBy	Varchar(50)	Store the user that created it	Null

Table 15: Schema for General Setup table.

S/N	FIELD	DATA TYPE	FUNCTION	CONSTRAINTs
1.	SN	Varchar(20)	Store mnemonic for the created category	Null
2	FirstName	Varchar(50)	Store the user first name	Null
3	LastName	Varchar(50)	Store the user last name	Null
4	Gender		Store gender for each user	Null
5	RoleAccessID	Varchar(20)	Reference a mnemonic for the created RoleAccessID	***FK***
6	Phone	Varchar(20)	Stores Phone Number	Null
7	Address	Varchar(50)	Store address for each user	Null
8	UserName	Varchar(20)	Store created username	***PK***
9	Password	Varchar(20)	Store user's unique password	Null

Table 16: A Schema for User table.

S/N	FIELD	DATA TYPE	FUNCTION	CONSTRAINTs
1.	SN	Varchar(20)	store a mnemonic for the created incident	Null
2	CrimeTypeID	Varchar(20)	reference a mnemonic for the created crimetypeID	***PK***

3	Description	Varchar(50)	Stores description of the created crimetype	Null
4	State	Varchar(20)	Store incident state	Null
5	LGA	Varchar(50)	Stores incident LGA	Null
6	ReportedDtTime	Datetime	Store date and time for the incident	Null
7	ReportedBy	Varchar(50)	Store Name of the reporter	Null
8	DeviceType	Varchar(50)	The type of connected device used by the visitor	Null
9	DeviceTypeID	Int	The unique code that represents the device	Null
10	MacAddress	Varchar(50)	The mac address of the connected device	Null
11	SecurityAgent	Varchar(20)	The security agency that should help the user to investigate the crime	Not Null
12	ProgressNote	Varchar(max)	The updates on the reported crime	Null

Table 17: A Schema for Incident table

.

S/N	FIELD	DATA TYPE	FUNCTION	CONSTRAINTS
1.	RoleAccessID	Varchar(20)	store a mnemonic for the created RoleAccess	***PK***
2	RoleTypeID	Varchar(20)	store a mnemonic for the created RoleType	***FK***
3	AccessRightString	Varchar(50)	Store the accessRight identity.	Null
4	CreatedDtTime	Datetime	Store date and time for the Role	Null
5	CreatedBy	Varchar(50)	Store Name of the User	Null

Table 18: A Schema for Role Access table

4.3 System Interfaces

4.3.1 Input Interfaces

Figure 11: The landing page

Figure 12: The Report querying page

Figure 13: The Login form for registered users

4.3.2 Output Interfaces

Figure 14: A View for a Registered Regular User

Chapter Five

System Implementation and Evaluation

5.1 Implementation

The application is dubbed ***EcrimeReporting***. The classes in section 3.4.2 above were replicated using ASP.NET and C#. Each class is prefixed with class and then appended with the entity or object name. There are about seven (7) classes, five (5) tables and thirty-one (31) stored procedures used for the implementation. The classes form the logic layer for the application. The tables are the most important database objects used for storage of information. The stored procedures are carefully scripted queries intended to accomplish one of these actions Insertion, Update, Delete. As users interact with the application, certain stored procedures are triggered to effect some specific changes or return some dataset to the client.

The interfaces are styled using cascading style sheet (CSS). The role access is separated by creating different master pages with appropriate user privileges. A master page is a user view that can be assigned to different users based on their access rights. The master page also ensures that users have common and consist view across the application.

The class attributes are set and accessed through the Property methods defined in each class. Whenever an attribute is to be set or got, the instance of the class is initiated and used as a reference to set or get one or more properties.

The dropdown items across the application are created as setups. The specific category codes and setup names are generated and used for setting up any specific item. E.g. Gender, Security Agent, etc.

5.1.1 Programming Tools

The following tools are necessary for the development of the proposed solution:

- ✓ Microsoft SQL Server 2005 and above
- ✓ Active Server pages DotNet (ASP.NET)
- ✓ Backend codes with C#

5.1.2 Hardware Requirements

The basic hardware requirement for both development and deployment environment is given bellow:

Any computer with at least

- ✓ 50 GB Hard disk space
- ✓ 2GB Ram
- ✓ Router / Lan configuration

5.1.3 Software Platform

The following software platforms are necessary for the development and deployment of the proposed solution:

- ✓ Internet Information Services (IIS): web server
- ✓ Microsoft Visual Studio 10 and above
- ✓ Windows Vista and above.
- ✓ A browser (e.g. google Chrome, Internet explorer, Firefox)

5.2 System Deployment

- ✓ Internet Information Services (IIS): web server
- ✓ Microsoft Window Server 2005 or q higher version
- ✓ Windows Vista and above.
- ✓ Microsoft SQL Server 2005 or higher version

5.3 Evaluation

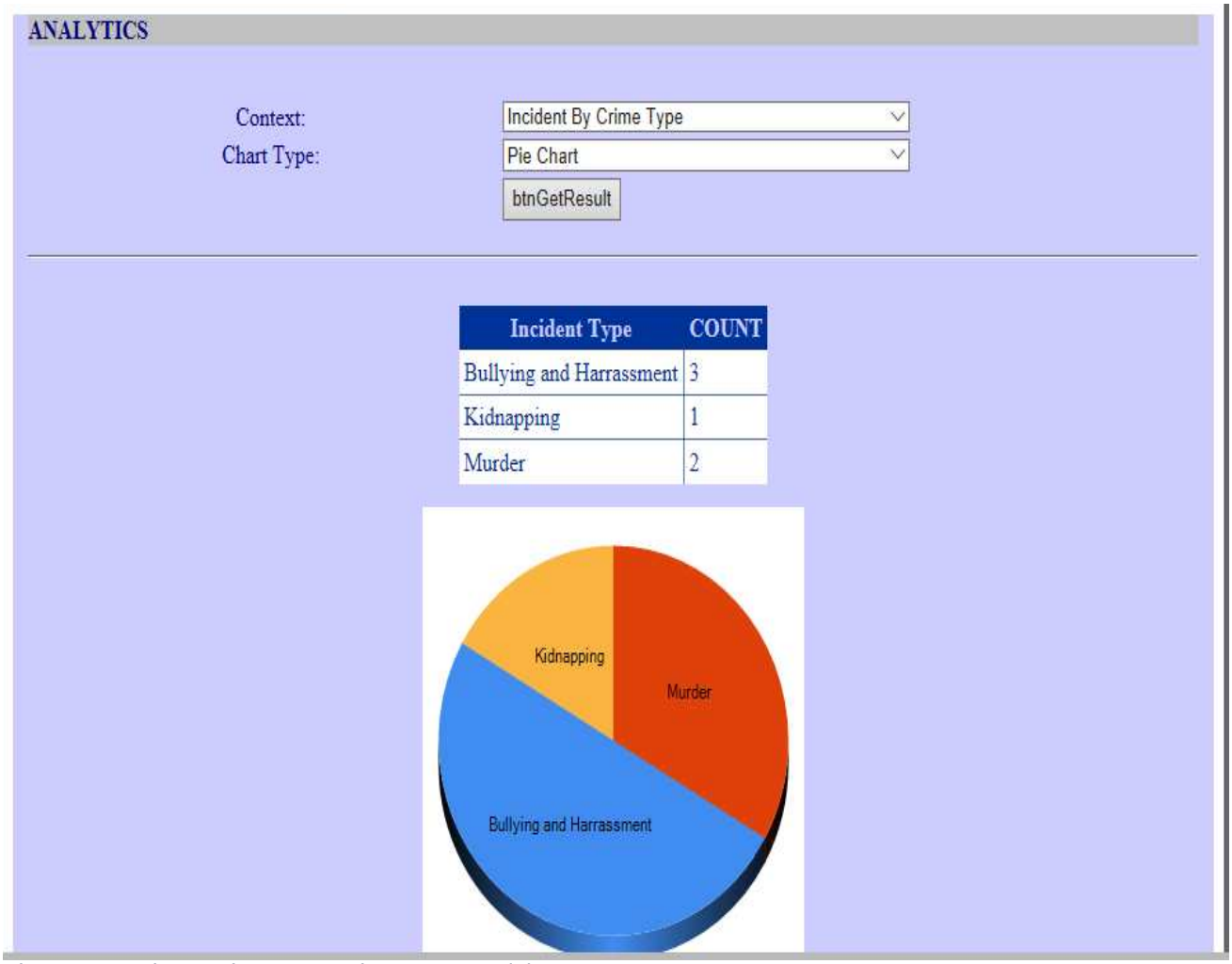

Figure 15: Crime Indexes Based on Context (1)

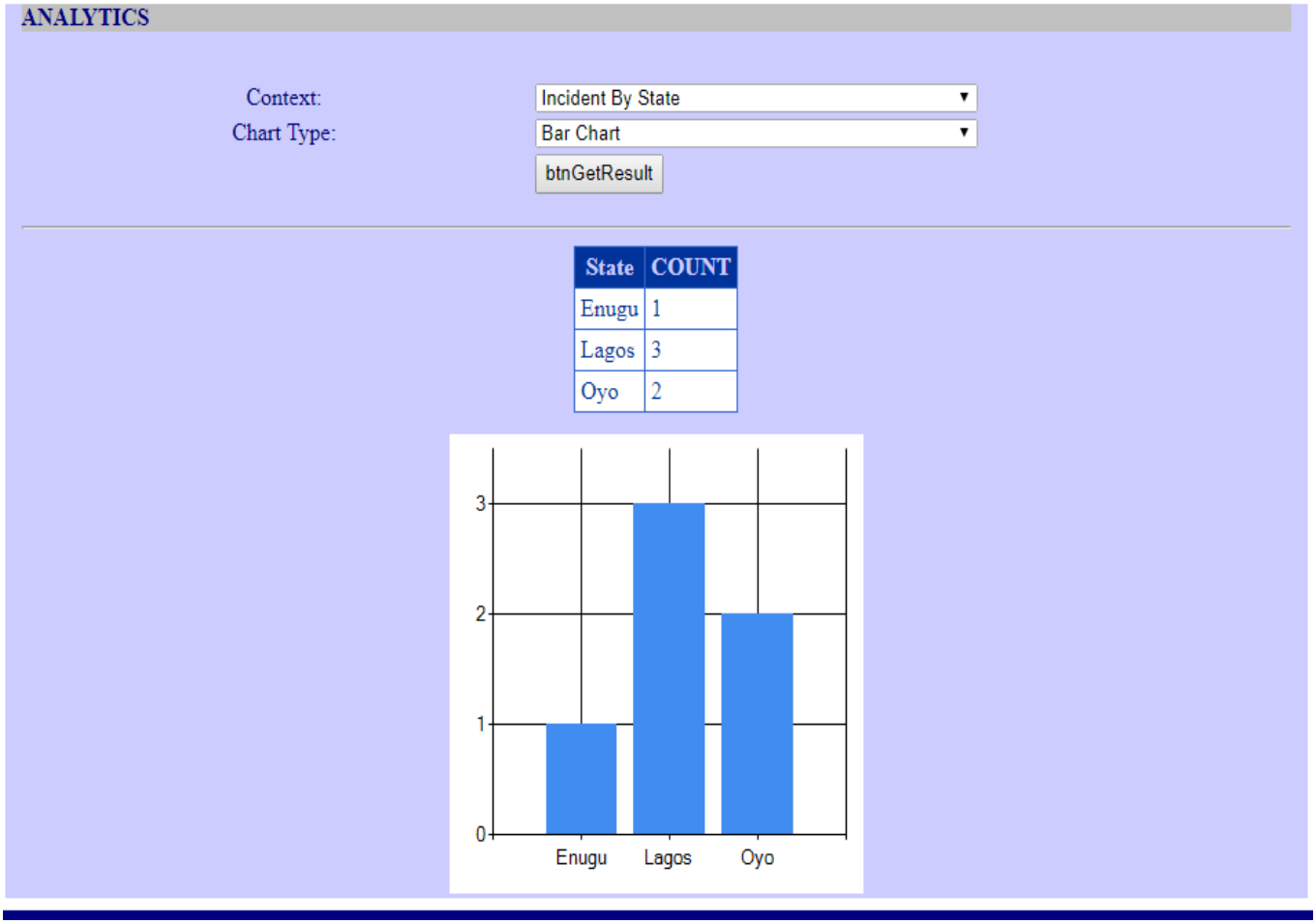

Figure 16: Crime Indexes Based on Context (2)

Fig 16 (1) & (2) above depict crime demographics as reported by the some users. All users and visitors will have access to this page. A User is a visitor that has registered on the platform. A visitor does not have to register before it can access the analytics page and check crime indexes based on some contexts. A user can select chart type to visualize the result. The chart will help to correlate the figures with the magnitude of indexes reported and which may prompt some actions.

The EFCC, ICPC or gossip platforms do not have this feature. This functionality can support policy makers, security analysts and academia to plan, project and preempt any security situation that can undermine our collective safety and sovereignty. This is a different direction to the way electronic Crime reporting has been done in Nigeria.

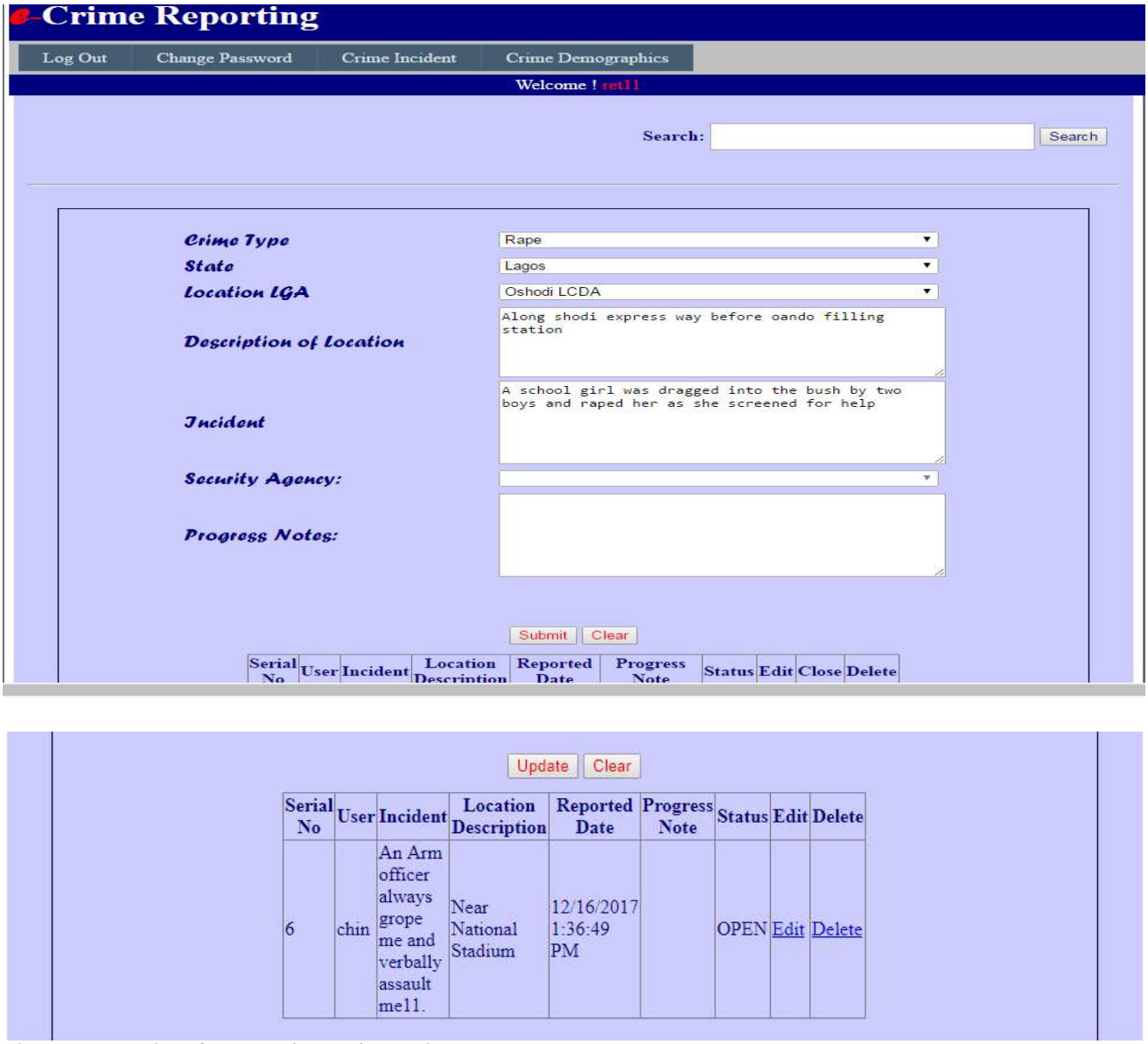

Figure 17: A View for a Registered Regular User

Fig 17 above depicts a view of a registered regular user. This is not an administrator (security agent or super admin). A registered regular user has higher privilege than a visitor, such that it can get feedback on any incident reported. Fig 17; represents a user dubbed “chin” reported a crime of Bullying and harassment that happened in Oyo state at Oke Bere LCDA. The user also wants the case to be served to the ARM administrator on the platform. The table below the form in Fig 17; also indicates the Status as Open and the date the incident was reported. A user has the privilege to edit or delete an incident if any security agent has not appended a progress note to it. Whereas a visitor can only report a crime but it cannot track the progress so far. The table shows that the incident has not been attended to by any of the selected security agent.

Figure 18: An Army Administrator Writing a Progress Note to an Incident.

Fig 18 above represents the Army administrator responding to a submitted incident. Once the progress note is added, the user who reported the incident will be able to see any update or outcome of the investigation. The Army administrator can only edit the field for the progress note. The platform allows all security agents to have dedicated users and should be able to investigate and give feedback as investigations progress.

Serial No	User	Incident	Location Description	Reported Date	Progress Note	Status	Edit	Delete
6	chin	An Army officer always verbally assault me.	Near National Stadium	12/16/2017 1:36:49 PM	We are currently investigating this incident. Be rest assured that the committee will carry out their function in sincerity and inline with the ethics of our oath to mete our justice.	OPEN	Edit	Delete

Figure 19: A View for a Registered Regular User with Feedback

Fig 19 above depicts the view for a user who gets a feedback for a reported incident. In Fig 17 above the same incident does not have a progress note but when the user logged in again and the Army administrator has responded it could read update on the investigation.

The super administrator has all the privileges combined. The super admin user will be able to manage users, setup new items and also lodge a new incident.

Chapter Six

Conclusion

6.1 Achievements

We identified the gaps in crime reporting information space in Nigeria; that there is no single all-encompassing crime reporting platform in Nigeria. The few platforms are either specialized or informal. There is also not collaboration and sharing of information among security agents because of ego and desire for public praise. The existing platforms also do not allow for anonymity of reporter, summary of crime indexes based on context and feedback on the progress of investigation. All these problems make crime reporting harder and our justice system questionable.

Section 5.3 above demonstrated how the proposed application can be followed to address all the gaps identified with crime reporting in Nigeria. We demonstrated anonymity of users, getting feedback on incident submitted, summarization of crime indexes and accountability on the part of reporters and security agents. The performance of the software prototype assures us that our approach to addressing current gaps in crime reporting ecosystem is viable and productive.

6.2 Limitation and Constraints

Users can register or an administrator can create some specific users. All users can manage their password. An administrator can manage users by disabling, enabling or out-rightly removing users. All users who register from the home page are referred to as Regular Users while those created by the Powerful administrator are Administrative users for different security agencies. Users or visitor may choose not to register on the application; such users will be able to view high level crime indexes and submit an incident but they will not be able to track the submitted incident or view the granular details of the crime indexes across the application.

All users can drop an Incident report. Only registered users will be able to view, edit or delete a submitted report. If a user drops an incident report, the user can only edit or delete it if a progress note as not had been dropped by appropriate security agent. Registered users can also get feedback on the incident submitted. Users will be notified when the incident has been fully investigated and documented. An incident can either have two statuses: Open or Closed. An incident with Open status means the case is still being investigated and no conclusion has been

reached. A Closed status means the investigators have reached a conclusion on the issue. The progress note should carry the outcome of the investigation. An administrator cannot edit or delete a closed incident. An administrator can edit the progress note if the case is not yet closed. A closed incident cannot be deleted; it becomes historical for future reference.

6.3 Recommendations and Future Works

We look forward to a time when names and identity of the offenders will be maintained on the application and some artificial intelligence techniques will be harnessed to predict the possibility of offenders committing the crime again or map hot spot locations and the frequency of committing a particular crime. These features will further make the application better and strengthen our security and justice system in Nigeria. Adopting our approach should bring us at par with best democracies and societies that have proper justice systems in the world.

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