

A Mobile-Based Prompt Security Alerting System on the Safety and Dangers of Travelling On Major Roads in Nineteen Northern States, Nigeria

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ABSTRACT: It is obvious that providing security to protect the lives and properties of citizens is the number one objective of government. However, the growth and escalation of insecurity in almost all nineteen states in northern Nigeria is alarming. Each state has its own insecurity mode ranging from Boko haram in the Northeast, banditry in the Northwest and Herdsmen-Farmers in North Central. Additionally, kidnapping exists in some states in the region with Kaduna-Abuja highway as the epicentre. Even though government is tirelessly putting more efforts to tackle the insecurity situation, the activities of these dreaded organizations still exist with alarming rate. One common operation of these dreaded organizations are the victims. Research shows that 35% of the victims of these insurgencies are innocent travellers. This research aims to provide a Mobile-based prompt alerting system on the safety or otherwise on road a traveller intends to use. The travel guide was developed by the used of two technologies, the searching system and machine learning algorithms. Data are obtained from TVC breaking news and Google Map was integrated in the App to provide the location of the event.

KEYWORDS: insecurity, banditry, herdsmen, farmers, kidnapping

I. INTRODUCTION

The 1999 constitution vividly states this on protecting the lives and properties of Nigerians “the security and welfare of the people shall be the primary purpose of government” [1]. Unfortunately, there is a failure at this constitutional rights at all levels of government. From 2009 to date, Nigeria is facing different types of insecurity from different types of dreaded or terrorist group. The activities of

these organizations has claimed the lives of thousands of Nigerians and properties worth billions of naira.

Many scholars have given several definitions of security, some selected definitions of security as cited by [2] includes but not limited to the following definitions: [3] defined security as the act of being safe from harm or danger, the defense, protection and preservation of values, and the absence of threats to acquired values. [4] also opines that security is the act of keeping peace within the governing territories. Accordingly, Adebakin,(2012) also viewed security as freedom from danger or threats, and the ability of a nation to protect and develop itself, promote and cherish values and legitimate interests and enhance the wellbeing of its people. From these definitions, it is clear that security is the number prerequisite of living and progress in any society.

Admittedly, the rising concern about insecurity cannot be explained outside the numerous terrorist attacks by the Boko Haram and other similar sects, the litany of kidnappings, increasing crime rate, the emerging culture of violence perpetuated by legal and illegal revenue collectors, youth militancy and cultism, the herdsmen-farmers conflict and other factors of insecurity that have been a regular feature of life in the country [5]. Against the reoccurring incidents of these factors of insecurity and the continued reassurance of the Nigerian government to control the situation, there is widespread doubt about the capability of the Nigerian government to provide adequate security for her citizens and others living within its territorial boundaries.

It is because of this loss of confidence in government that makes some community to look for a way forward. Many communities form various volunteering groups to tackle the insecurity that affects them. These volunteering groups include Civilian Joint Task Force (CJTF) in Maiduguri the Borno state capital, vigilante group in Yobe state, Sarkin Baka in Adamawa state and so on. With the community efforts, the activities of the insurgents have drastically reduced in major cities.

However, the insurgents change their methods of attacks from attacking major cities, to attacking major roads. There are many security personnel deployed on the major roads, but their deployment remains in vain. The victims of the new tactics are the innocent travellers.

Therefore, there is need to devise a means of helping these travellers on the safety and precautions of using the major roads.

The use of Mobile-based alerting system can greatly help the travellers by giving updates on the security situation of the road they intend to use. To this end, this research studies the roads condition and comes up with an alerting system that can help the innocent travellers with relevant and updated information on the safety of the roads they intend to use.

It is no longer a news that residents in some regions in northern Nigeria now sleep with one eye open while government who ordinarily is charged with the protection of lives and property seems lost and incapable of doing this. When citizens of a country lost confidence in government about the security of their lives and properties, they must devise a means of protecting themselves. This is what happened in most of the northern states. Unfortunately, the means devised by the communities are mostly home-based. This means that, anybody that leaves home is at risk of one insurgent attack or the other. This research identified the following problems as regards the use of major roads in northern Nigeria.

1. Travellers with little or no knowledge about insecurity in certain regions tend to be victims of insurgents by unknowingly using the roads at odd time;
2. Sometimes the travellers are finding it difficult to distinguish between the insurgents and the security personnel;
3. Lack of available and timely information where there was attack, as a result, the innocent travellers fall in the hands of security operatives as victims of circumstance and
4. When travellers are informed about an attack, they lack which direction to follow in order to escape from falling into the hands of insurgents.

The objectives of the research is to develop a Mobile-based security alerting system that has the ability:

1. To frequently provide updates to travellers about the security conditions of the roads before they start their journey;
2. To provide the security features of identifying the genuine security operatives from insurgents;
3. To provide a timely and reliable information about occurrence of an attack and advise to immediately boycott the road to avoid being victims of circumstance
4. To use Google Map in guiding the travellers of how to change direction when alerted about attack on the road they are using.

II. LITERATURE REVIEW

Scholars have given different definitions of security as cited by [2] which includes but not limited to the following: Nwagboso (2012) defined security as the act of being safe from harm or danger, the defense, protection and preservation of values, and the absence of threats to acquired values. [4] also opines that security is the act of keeping peace within the governing territories.

On the other hand, insecurity can be defined as the absence of resistance to or protection from harm, peaceful co-existence and development at large. Achumba, Ighomereho and Akpor-Robaro (2013), simply see insecurity as the opposite of security which tends to affect human life and existence. Generally, insecurity can simply be referred to as the absence of security.

In Nigeria, the rate of insecurity is alarming and is affecting every facet of Nigerian life with no sight of end (Emmanuel et al., 2019). Scholars have identified many factors associated with the increase of insecurity in Nigeria and suggested possible ways of solving it. Poverty is considered to be number factor for creating and promoting violence especially among the youths [6], the authors suggested that, poverty alleviation can reduce the level of insecurity in Nigeria. However, the research showed that, the so-called poverty alleviation programmes been planned and implemented by government at various level yielded nothing rather than avenue for the enrichment of the political class.

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Another factor that resulted insecurity is the religious fanaticism according to [9] which is been fuelled by power-drunk and over-ambitious politicians to achieve their interests. The researchers suggested that, massive industrialization for job creation would reduce the level fanaticism.

Corruption is another major cause of promoting violence and inability to end the current insurgency in Nigeria. According to [3], corruption remained the major cause of lack of the development in Nigeria and a leading factor of unemployment. It has also resulted in political rivalry, tribalism and many other social vices in Nigeria.

There are numerous reasons for the growth of insecurity in Nigeria and scholars have done their parts by studying the factors and devising the possible ways of containing it [3].

Scholars also gave alarming warnings about the consequences of insecurity in Nigeria. Food security, the activities of boko haram has greatly reduced the production of food as the major occupation in epicentre of the insurgent, that is, the north-eastern Nigeria [10]. Commerce and industry section has also suffered tremendously which affected the revenue of individuals and the government itself [8]. Social activities also face challenges in areas where insurgency is high [4].

Road deterioration and Telecom Mast destruction [11] are also the aftermaths of

insurgency. With all these researches and many more that were not reviewed here, suggestions given to government to tackle the barbarisms as well as ungodly activities of the dreaded organizations, government seems to have short fallen to fulfil its prime responsibility of protecting the live and properties, it is concluded that government alone cannot tackle the insecurity in Nigeria and therefore “tackling insecurity is a responsibility of all”.

With these reviews on related works on insecurity in its aftermath in northern Nigeria on one hand, and the failure of government to contain the menace, communities decided to take various measures to tackle the insecurity. Among these are the emergence of Civilian JTF in Maiduguri that assists the JTF in fighting boko haram terrorists. CJTF has recorded tremendous achievement in complementing the war against insurgency. The Sarkin Baka in Adamawa state also complemented the war against the insurgents the way CJTF does. Another group of community initiated volunteering group are the Vigilante group in Yobe, Kaura group in Bauchi, etc. These groups have assisted in recording many successes in the war against insurgency.

However, the home-made volunteering groups carryout their operations mostly as home-based.

With the positive achievement recorded in tackling the insurgency, the terrorists devise a new plan of carrying out their attacks. This new plan is nothing but attacking innocent travellers on their missions on the major roads. These including the bobko haram, kidnappers, and armed bandits in the North-East, North-Central and North-West regions respectively.

In the literature studied, most of the measure proposed by researchers are government-based, unfortunately, none of the recommendations is fully implemented. For the innocent travellers, the only way to help them while on their missions on major roads is to devise a security alerting system to serve as security guide while using the major roads.

ICT was used to develop a Mobile-based security alerting system for travellers. Details of the design and implementation of the system are discussed under methodology section. This is the first approach in its kind in Northern Nigeria.

III. METHODOLOGY

This section describes the steps, processes, materials and methods that were employed to properly design and implemented the proposed Mobile-based security alerting system for travellers. Data sources, types collection, coding and analysis are also explained. Technologies used to devise the system are also stated in this section.

Steps of the research

The following steps were used to design and develop the Mobile-based security alerting system.

1. Feasibility study: this includes economic feasibility, is it economically important to design the system? It is obvious that lives and properties of innocent travellers are very important and need to be protected, therefore, economically the research is feasible.

Technical feasibility: are there technologies that can be used to develop the proposed system? With the presence of Geographic Information System, Google Map APIs and the web, the research was technically feasible.

Data Type, Source, Collection and Analysis

Three types of data were used in developing the system. These data include the following:

1. Primary data: these are data that are directly collected from selected residence and

travellers of the area under study. The data collection method was verbal interview.

2. Secondary data: are data obtained from archives stating the history of attacks, types of attacks and type of insurgents that carryout the attacks example boko haram, armed bandits, etc.
3. Real time data: are data obtained as they occur, these data can be accessed from TVC breaking news on insurgency. The data collection at TVC would be done using jsoup. This data can be used to update the database of the proposed system by giving the current security situation of the region under study.

Materials and Methods

Materials required to develop the proposed system include:

1. **Google Map APIs:** an application programming interface where the interface of the App, it would also be used to give directions and locations of events as they occur.

2. **TVC News System:** this was used to subscribe customised breaking news from TVC newsroom to the proposed App. This news is being used to alert the travellers on the safety of the roads they intend to use.

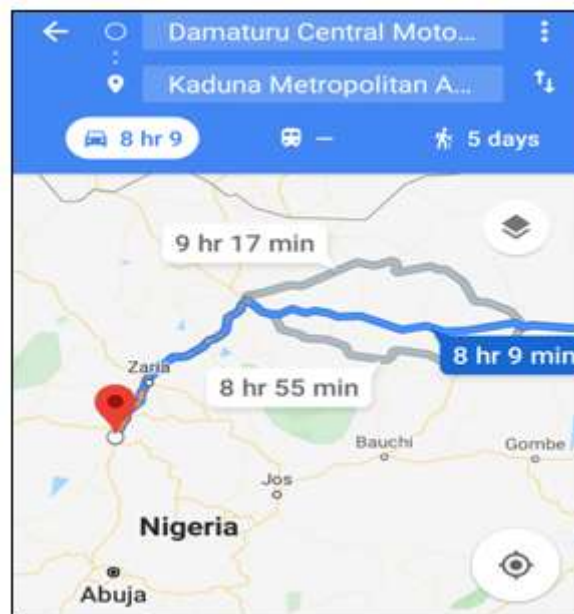


Figure 1: Sample of Google map interface



Figure 2: Sample of TVC news on Yobe insecurities

1. Dedicated Website Development Tools: this include Nodejs MySQL and Javascrrips.

Architecture of the proposed system

The proposed system is made up of three components as shown in Fig. 1.

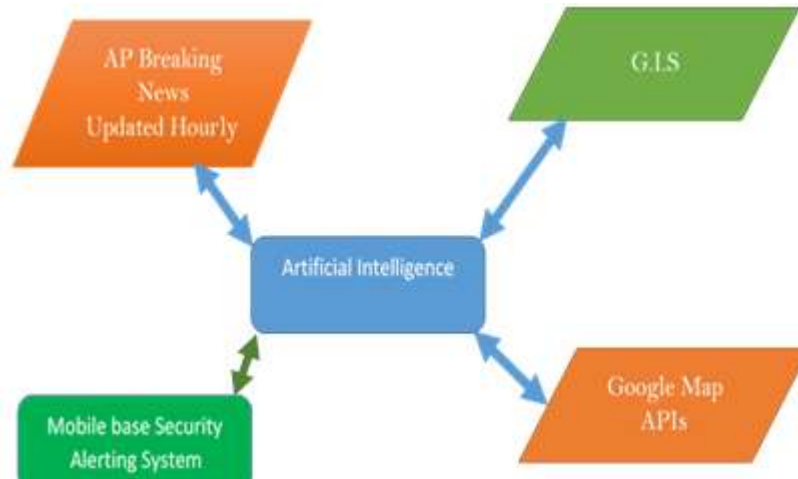


Figure 3: Architecture of the proposed system

The TVC Breaking news is the information that the proposed system used to update its content after every 6 to 24 hours. G.I.S. provides information about landmarks of the region. Google Map APIs allows to create a customized map of the area under study. Machine Learning is the Artificial Intelligence tool that was used to design the App, ML is known for prediction and forecasting purposes [12]

Features of the Alerting System

The alerting system would have the following features:

- a. Register a new user
- b. Provide updated information about the safety of roads
- c. Provide guide on the current location of the user and its safety

d. Notifications for user when the user went offline for more than 12 hours.

i. **Registration page:** this is where the new user provides his/her details and have an count, this is the first step of using the App. See Fig.4

Menus of the App/Interface

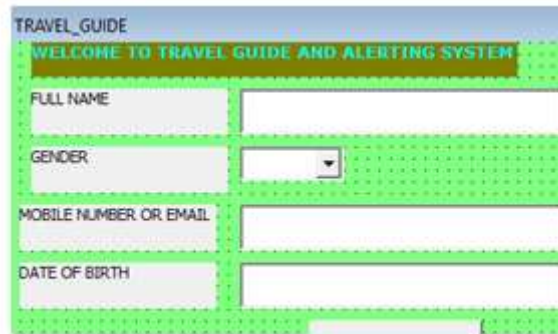


Figure 4: Registration/ Home Page

- ii. **Driving guide:** this is where the user would be guided about the direction, distance and landmarks on the road.
- iii. **Safety Assessment:** this menu provides the user on the safety of the road based on recent data history.

expected function which implied that the objectives of the research were achieved. The following are key aspect of the App in which every traveller must understand and use.

IV. EXPERIMENTAL RESULT AND ANALYSIS

The User Travel Guide App software was designed and tested by selected travellers. Over 200 travellers were randomly selected to test the accuracy of the App. The system has performed the

i. **The Home Page:** this is the interface where the user provides details about his travel. The details are the source (the origin where the journey commences) and the destination (where the journey ends). After supplying the travel details, the travel would then search for the safety of the rout. The Home Page is shown in Fig. 5.

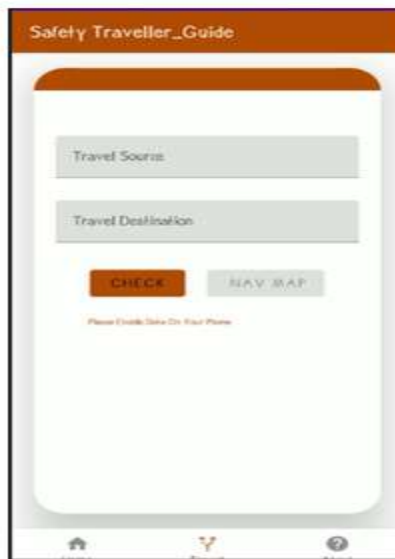


Figure 5: Screen to Capture Travel Data

ii. **Searching and Search Result:** after the traveller has supplied the travel details, the App

would then search for news concerning the route and the status of the destination. The App

would search the news from TVC news, selects data about on recent security situation of the destination. The App would use Artificial Intelligence Algorithm to classify whether it safe to travel or not. Fig. 7 shows a search result of travelling to Damaturu from Geidam, the result shows that, it was not advisable to travel

to Damaturu at that very moment. The result shows some news about insurgent (Boko Haram) attack. Fig. 8 shows that, it is safe to travel from Damaturu to Zamfara since there was no recent news about insecurity on the route.



Figure 6: User inputs Geidam & Damaturu as source & destination Respectively



Figure 7: Shows search result of travelling to Damaturu from Geidam, not safe to travel

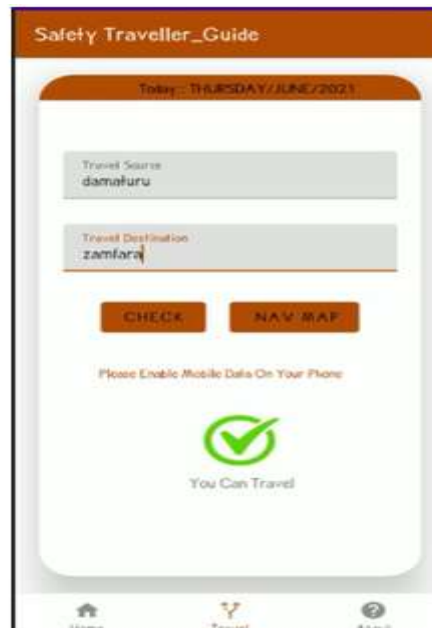


Figure 8: Search result shows that; it is safe to travel to Zamfara from Damaturu

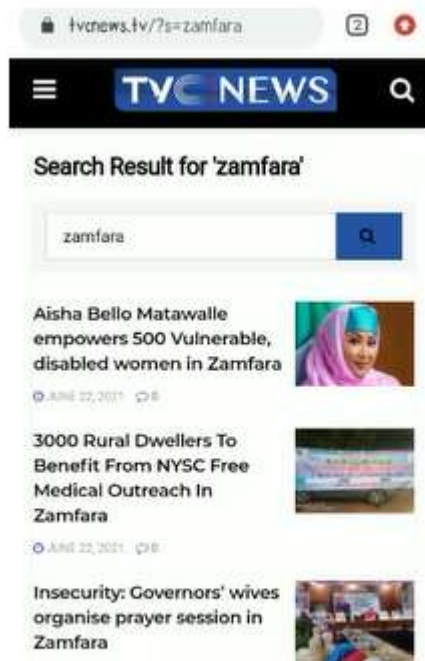


Figure 9: Search result showing news about Zamfara shows no negative news

V. CONCLUSION

This paper presented a User Travel Guide App software. The researcher studied the current security situations of various parts of Northern Nigeria. The security situation makes travelling in

the region as risk of lives and properties. It is also inevitable to stop travelling in the region despite the risks involved.

The User Travel Guide App software has helped and continue to help travellers on the safety or

otherwise of the roads they intend to travel. The App can tell the travellers to whether it is safe to travel at certain time to certain region.

Google Map API was used to designed the App while jsoup library was used to capture filtered data related to insecurity. The filtered data are collected from TVC Breaking News. The news is updated after every 12 hours. The App has reduced difficulties faced by travellers and increased the rate of travelling in the region.

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