# Personal Safety Application: Challenges And The Way Forward

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**ABSTRACT**
*This project aims at developing an Android mobile application that would provide personal safety to its users. As students leave the university, they travel to new places and are held responsible for their whereabouts for the first time. The process of making new acquaintances can make them vulnerable, especially when they do not notify anyone concerning their whereabouts.  The increase in student abductions owing to banditry activities and the other similar groups, has led to untold hardship and instability to the life of students, their parents and the university staff at large. The fear for kidnapping is in the minds of every citizen in Nigerian today. It is to this respect that, PinacleSafe, which is an android-based mobile application that has features to keep students and staff safe in everyday life and in true emergencies, was developed. The application is suitable for Android phones and is implemented using Java and XML. The test experiments show that the application is easy to deploy and use, portable and fast.*
**KEYWORDS:** *Safety, Vulnerable, Abduction, Banditry, Emergency.*

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## I.    INTRODUCTION

As students going out from the university, they go to unfamiliar places and are often responsible for their whereabouts for the first time. Being still in the process of making new friends can make them vulnerable often not telling anyone where they are going, and the increase in the abduction of students due to the terrorist group so-called Boko haram and the other Bandits groups bring instability to the life of students and their parents and also the university staff, fear for kidnapping is in the mind of every citizen in Nigeria, especially students.

According to Guardian, one of the popular newspaper websites -a recent statistics carried out by the Incentive-based Programme (IBP) of the policy house international has revealed that over 800 school children were kidnapped within three months (Joke, 2021). Where among them there are some from the higher institutions, now most of the citizens have smartphones. PinacleSafe is a mobile application that will have features to keep the student and staff safe in everyday life and in true emergencies.

Abduction of student become a profitable business to unpatriotic citizens where they use the student to collect ransom from their parent or government. According to Aljazeera.com news media, Gunmen abducted students from Forestry College Northwest Nigeria (Aljazeera, 2021), with about 30 students taken hostage, and over 800 school children were kidnapped within three months (Joke, 2021). PinacleSafe is a mobile application that will have features to keep the student safe in everyday life and in true emergencies.

Our specific research objectives are:
i.    Identify the requirements that the app should meet to achieve its purpose.
ii.   Analyse the requirements and do a technical feasibility study in order to decide how they should be implemented.
iii.  Design the required functionality and the user interface based on the included features.
iv.   Implement the selected functionalities.

This study would, at the end, serve as a pointer to the importance of properly securing banking cyber space. It will highlight new methodologies used by hackers to gain access to banking data and information and societal monies. The study will also serve as reference for future studies and researchers.

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# II. LITERATURE REVIEW

Many mobile safety applications or emergency applications have been developed to improve the safety of an individual, some of the relevant applications are reviewed as follows:

## NISPSAS

Nigeria Internal Security and Public Safety Alert System (NISPSAS) is part of Federal Government efforts to provide adequate and prompt response to emergencies and safety of lives and properties. It has a Mobile Application dashboard for the public to report Fire, Crime, Medical, and Accident distresses (SCADA Communication, 2021). Where it has the following function, call 112, fire alarm, prevent flood, complain, see something say something.

## NISPSAS Limitation

Users can not trigger the application without unlocking the screen, to trigger the app you have to unlock the screen, look for the app, open it and select the type of emergency you want, which is not feasible when the situation is critical.

## SETY

Sety takes your incident reporting to the next level. It affords you the ability to report and broadcast any dangers to anyone around you. It also provides you with so many safety tools. Sety also allows you to maintain a circle of emergency contacts of friends and family to receive alerts when you report an incident. Sety is a mobile application that provides safety to individuals and the developers redefined emergency reporting by creating a community for people to look out for one another (Sety, 2021). It has the following functionalities: request an ambulance, missing Persons, report danger, activate siren, initiate a fake call, Security agent.

Sety has free plan where you can only connect to two people around you with no SMS notification and connection to the Sety hero and other premium plan where you can connect to more than two people in a Sety community and also to Sety hero.

## Sety Limitations

Some of the features are not implemented such as Security agent, Request ambulance and also Missing Person feature is premium task. Also, users' safety depends on the Sety users' community which is not advisable they may be offline, another limitation is when triggering the app, you have to unlock the screen, look for the app, click on it then select the type of emergency you want to report, which is not feasible when the situation is critical.

## Aabo

Aabo is a mobile application allowing you to communicate your emergencies seamlessly with the people that can help you. It has the following functionalities: Rape report, Police harassment, Health Emergency, Fire Emergency, and register emergency contacts. (Aabo, 2021)

## Aabo Limitation

To trigger the app, you have to unlock the screen, search for the app, click on it and select the type of emergency you want to report, which is not feasible when the situation is critical.

## LifePlug

LifePlug is a mobile application for Android phones which provides a simple way of notifying selected contacts in case of an emergency. The setup consists of plugging in the earphones and activating the app. In an emergency, the user unplugs the earphones and triggers an SMS alert with the user's location (Bmpi, 2016).

## LifePlug Limitation

To trigger the app you have to plug in the earphones, where not everyone uses earphones. And when the app is uninstalled the phone cannot be tracked.

## Samsung SOS - Smart Phone Emergency Message

The Samsung smartphone SOS feature makes it easy to notify a contact when you are in an emergency. When the Samsung SOS feature has been turned on, this means when you press the lock button three times your device will automatically send out a message saying: "SOS", followed by a link that when opened will show the coordinates of where you are. You can add to this feature and allowing a photo and/or a voice message to also be sent out with the message to help provide more evidence of where you are and what is happening (SAMSUNG, 2021). Samsung offers an inbuilt emergency application that sends your approximate location to selected contacts on emergency, to trigger the applications long-press the power button then select emergency

Samsung SOS - Smart Phone Emergency Message Limitation
This app is preinstalled in Samsung smart phones which means the app is limited to Samsung users, in the process of triggering the app, kids can activate the app mistakenly because it is triggered by clicking the power button three times

Emergency Plus
This app is own by New South Wale, State in Australia. It sends the location to emergency agencies as you select the one you want to trigger the application it should be open and three-word authentication is required (National Triple Zero Awareness Work Group , 2020).

Huawei Emergency feature
This app is inbuilt in some Huawei phones, to use the app you should set it from phone settings Privacy > Emergency SOS, enable Also send SOS message, and set your emergency contacts. In case of emergency: Press the Power button five times in rapid succession. An SOS message with your current location will be sent to your emergency contacts. After the message is sent, the emergency call screen will be displayed. Quickly call an emergency service, such as police, fire service agent, ambulance, or your emergency contact (Huawei, 2021).

Huawei Emergency Feature Limitation
The app is limited to Huawei users and also due to the clicking the power button five times to trigger the app, kids can activate the app mistakenly and even some people play with their power buttons.
In summary, as stated earlier, only SAMSUNG, Huawei emergency, and LifePlug app can trigger the app and send automatic SMS (Bandwidth, 2023) without looking at the phone screen which is among the features this project focused on however it's easy to trigger the application by mistake. This Project focused on how to make it easier to trigger the app without looking at the screen as well as avoiding triggering by mistake and provide possible necessary information such as sending user recent call logs, location after every 30 seconds as soon as the location is changed and to find someone in an emergency as well as guiding a person home if he is in a new place for the first time. management is resilience and recovery.

## III.    METHODOLOGY
PinacleSafe is an android based mobile application that will provide safety to its users by allowing them to register 5 mobile contacts that will be notified of the user location in an emergency by sending the users' most recent call logs and his current location for quick follow up and investigation. The methodology used in the development is iterative waterfall model, which develops a working prototype at first iteration, the evaluation of the developed prototype results in another iteration that produces another prototype with more features and improvements to the existing prototype.
This method is employed because the mobile application market is fast-paced and requirements may change continuously and rapidly. Factors that could cause the requirements to change are the external client, limitations of the system, time, lack of resources. Interview method of data collection was adopted as a fact-finding technique. A number of 20 University staff and 30 students were interviewed on how they use personal safety app, and their suggestions on these apps. Some questions were asked during the interview process and their responses were analyzed using bar charts as follows:

Proceedings of the interviewed in the first iteration are:
v.    Do you use any of the personal safety application?
vi.    How it works?
vii.    What the application lacks.
viii. Any suggestion for improvement?

## IV.    FINDINGS
Based on the facts obtained from the interview, the system is developed and tested by some students and 2 of staff for validating the system. The system is tested for the proposed functional specifications; the first test goes on triggering the app using volume key of an android device. The triggering test is categories into 3 scenarios:
i.    Scenario 1: simultaneous double click on volume up and down keys very fast
ii.    Scenario 2: pressing of volume up key once then triple clicks on volume down key at fast speed.
iii.    Scenario 3: long press on volume down key then click it four times at fast speed. In all these test cases, the last case seems very easy for both the staff and students. Figure 1b below shows the graphical charts for the test case scenarios.
The above graph shows the number of staff and student against different triggers of the app which are defined as scenarios where the student or staff able to get it in the first trial. Scenario 3 is observed as the simplest

trigger.

The above graph shows the number of staff and student against different triggers of the app which are defined as scenarios where the student or staff able to get it in the first trial. Scenario 3 is observed as the simplest trigger.

The above graph shows that number of student and staff against use of personal safety application, where the number of staff that uses such kind of apps is greater than that of student.

**Key Algorithm:**

```
public class GmapActivity extends AppCompatActivity {
AlertDialog builder;
private String  curLocation;
String destination;
SqliteDatabase mDatabase = new SqliteDatabase(this);
LocationService locationService = new LocationService();
private String currentLocation;
private String home_destination;
private String glatitude;
private String glongitude;
Button guidbtn;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_gmap);
loadDialog();
startLocationService();
//GotoMap();
findViewById(R.id.guide_btn_Gmap).setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
GotoMap();
}
});
}
```

## V.    CONCLUSION AND RECOMMENDATIONS

This study was carried out to improve safety to the life of students and staff of GSU by developing an android based Personal Safety Application which is easier to trigger the app and hard to trigger by mistake and also provide some useful information to help the security for investigation and tracking the user (Byte Mining. (2021).

The proposed system was successfully implemented. The aim of this research was achieved, the functionalities of sending SMS with location update after every thirty seconds, and long-pressing down volume key and press it four times to trigger the app and the ability to guide the user back to home or known place registered in the app are all implemented

Only a few of the students and staff of GSU use personal safety apps from the output of my interview, but the following recommendation will help.
•    The University should make it a policy for the staff to have the app on their phones.
•    The University should provide awareness to the student to use the app for their safety.
•    Service providers such as MTN, Airtel, Glo should allow low-cost SMS subscription for such application
•    Further work should overcome limitation of this project

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