

FIG WORKING WEEK 2023

MAY 28-1 JUNE, 2023



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Web application for field accident reporting: A case study of Land Surveyors in Ghana



INTRODUCTION

Land surveyors play integral role in land development, from planning, design to the final utility construction.

Land surveyors are the first people to calculate and chart the land on any construction site.



A Land Surveyor working on the field, is prone to all forms of accidents.

INTRODUCTION

This paper is premised on the utilization of interesting capabilities of geospatial technology and the web offer in real time accident reporting for land surveyors in Ghana.

Land surveyors need to be protected by way of knowing what happens around them, most especially on the field of their operations.

A Land Surveyor

Alone or in a group on the field, the Land Surveyor is prone to all forms of accidents not limited to the following;

- i. Snake Bite
- ii. Mob Attack
- iii. Stoppage of work
- iv. Seizure of Instruments
- v. Wildlife encounters
- vi. Attack by wild animals
- vii. Motor accident
- viii. Natural disaster





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PROBLEM STATEMENTS

Accidents do happen day in and day out and many of these accidents go unreported due to certain factors such as, lack of reporting procedures, no knowledge on how to report these accidents and no further actions are taken when accidents are reported. Although in certain industries accidents are reported and details of these accidents are available, there is no system to analyze these in a systematic manner. As a result, effective measures to prevent further accidents are not laid down and sensitive or hot spot zones for the various accidents happening cannot be determined easily.



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THE OBJECTIVE

The main objective of this paper is to develop a *web app* showing the types of accidents that happen during field survey works.

Specific objectives

The objective is to develop web application in order;

- to know the exact locations of these accidents and plan their responses.
- to help land surveyors to report all accidents on a common platform so as to analyze and take better decisions.



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CHALLENGES LAND SURVEYORS FACE ON THE FIELD

Land surveyors face a lot of challenges on the field, some resulting in various degrees of accidents and injuries.

Every job has its challenges; land surveying is no different. Every day brings different issues to resolve that don't always respond to quick fixes. However, there are a few challenges that are quite common to the profession, and here are an overview for special consideration. (i) Seizure of Survey Instruments, (ii) Stoppage of field work by litigants (ii) Assault by unidentified persons and squatters (iv) Attack by wild animals (v) Motor Accident.

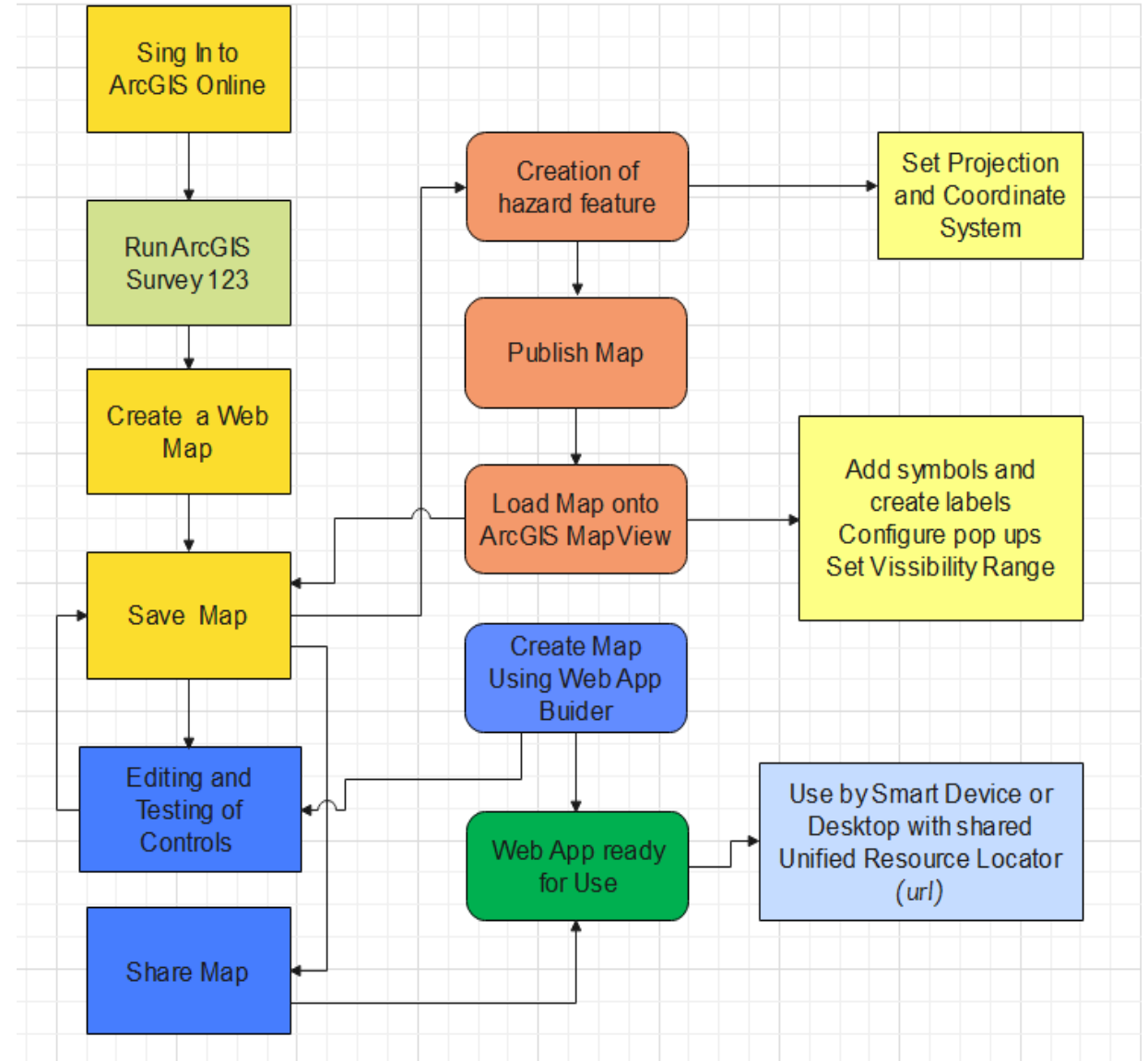
GIS FOR ACCIDENT REPORTING

- There are multiple location-based services (LBSs) and mobile GIS available for a wide range of applications. Usually, such applications are developed to solve a restricted task within a restricted environment. The focus on a particular task is strong, and therefore, such applications can usually not be used in multiple environments.
- In recent years an extended form of GIS has emerged, mobile GIS, with which users can access the spatial, attribute and temporal data without any location limitation. Spatial analysis is no longer limited to a fixed environment, and it can be carried out at any place in any time
- For all mobile GIS applications or services, providing fast response and accurate information are two of the main goals

METHODOLOGY

GIS for accident reporting

Design Workflow



SOFTWARE AND TOOLS USED FOR THE STUDY

The following software was deployed for the task;

- ❖ ArcGIS Survey123: For configuring and building the geoForm.
- ❖ ArcGIS JavaScript API using Dojo Framework: The source code of the GeoForm was edited with notepad++ using knowledge of JavaScript and the Dojo Framework.
- ❖ ArcMap: For displaying the spatial distribution of the accident scenes.
- ❖ ArcGIS Online: Web Map.

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The Field Reporter:
The use of ESRI Survey
123 for the creation of
the GeoForm

Realtime Field Incident/Accident Report Form

This App is for Land Surveyors to report incidents/accidents while going to the office or working on the field.

Name of Land Surveyor*
The full name of surveyor is needed here.

Surveyor*
Provide Type of Surveyor

-Please select-

Identifier*
Provide Number/ID that is applicable.

Phone Number

+233

Locality*
The location of the accident scene

Incident Type*

-Please select-

Region*
The 16 Regions of Ghana

-Please select-

Upload Image/Photo

Drop image here or select image



Brief description
Optional

Date and Time of Reporting

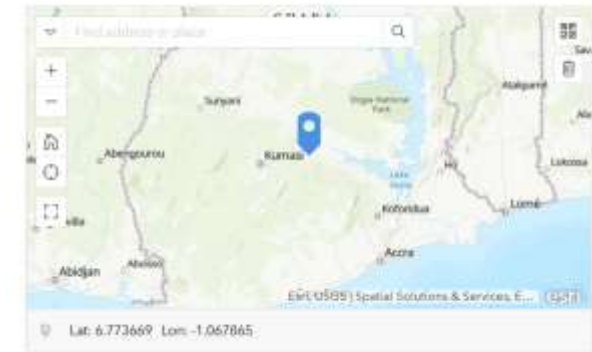
4/25/23 12:10 PM

Submit Entry

Accident Potential*

-Please select-

My Location



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Survey link

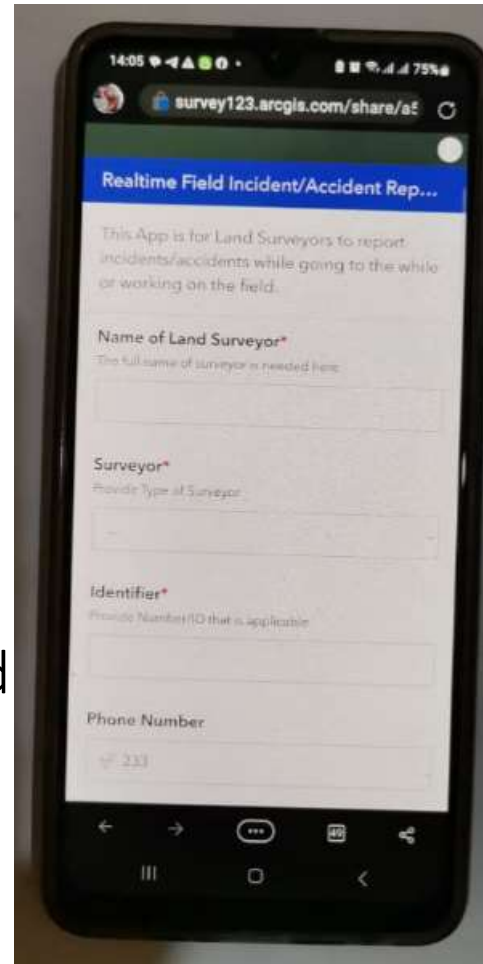
<https://arcg.is/1XnCPH1>



Scan the QR code to open the survey on your device.

[Click to download](#)

The shared link with Land Surveyors.



Mobile Device

Realtime Field Incident/Accident Report Form

This App is for Land Surveyors to report incidents/accidents while on the field.

Name of Land Surveyor*
Please provide your full name

Surveyor*
-Please select-

Identifier*
Provide the Number or ID that is applicable

Phone Number

Locality*

Region*
-Please select-

Incident Type*
-Please select-

Harm/Potential*
-Please select-


Brief Description
Optional

Upload Fotos Here
Optional

[Drop images here or select image](#)

My Location*
Press the map and press the "Find My Location" icon on the map to zoom into your exact location.

Find address or place



Zoom in to 100m level to set location

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Lat: 7.757966 Lon: -84.29184

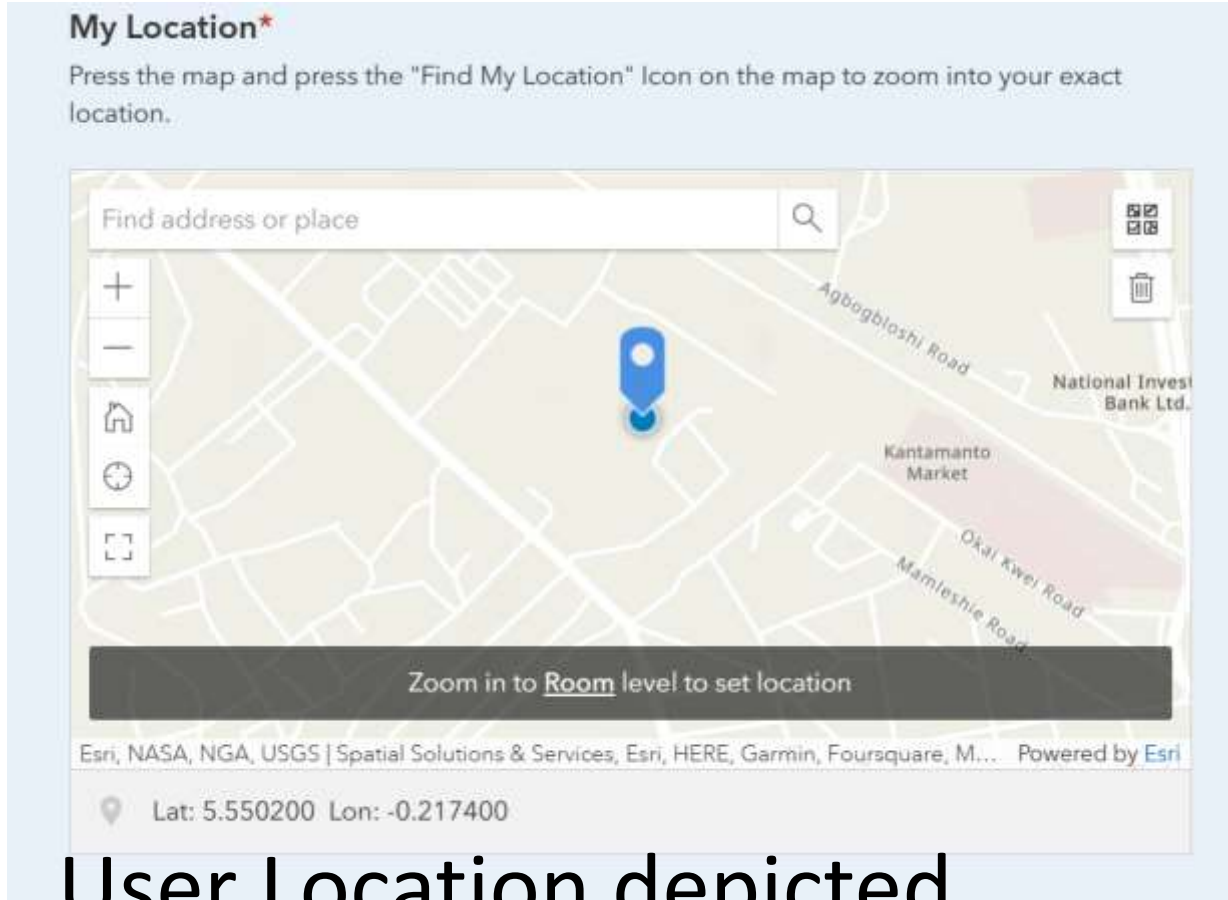
Date and Time of Reporting

2/5/2022 12:37 PM

Submit

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Locations of reported accidents



● Accident Scene/Locations

User Location depicted on the app

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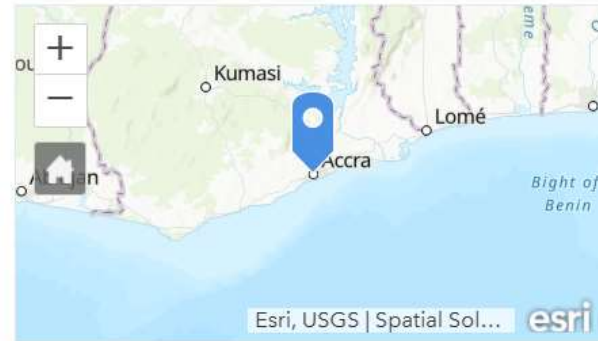
Reported Accidents at a glance



A Typical Reported case



Lat: 5.603802 Lon: -0.263735



Brief description	Date And Time Of Reporting	Region	Region
I was attacked by Armed men without any warning My Gps device was smashed into bits and my theodolite has been siezed by the chief of the area	Apr 24, 2023, 12:48 PM	Greater Accra	
	Apr 25, 2023, 12:45 PM	Greater Accra	

Brief description

I was attacked by Armed men without any warning
My Gps device was smashed into bits
and my theodolite has been siezed by the chief of the area

Date and Time of Reporting

Apr 24, 2023, 12:48:00 PM

Kojo bonsu

Surveyor

Official

Identifier

0132

Phone Number

233,505,376,852

Locality

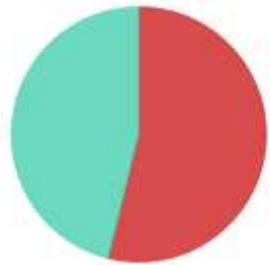
Kwabanya

Incident Type

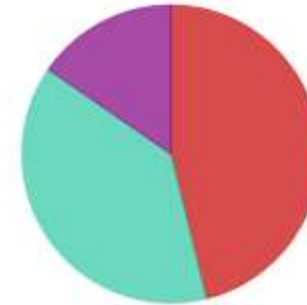
Seizure of survey instruments

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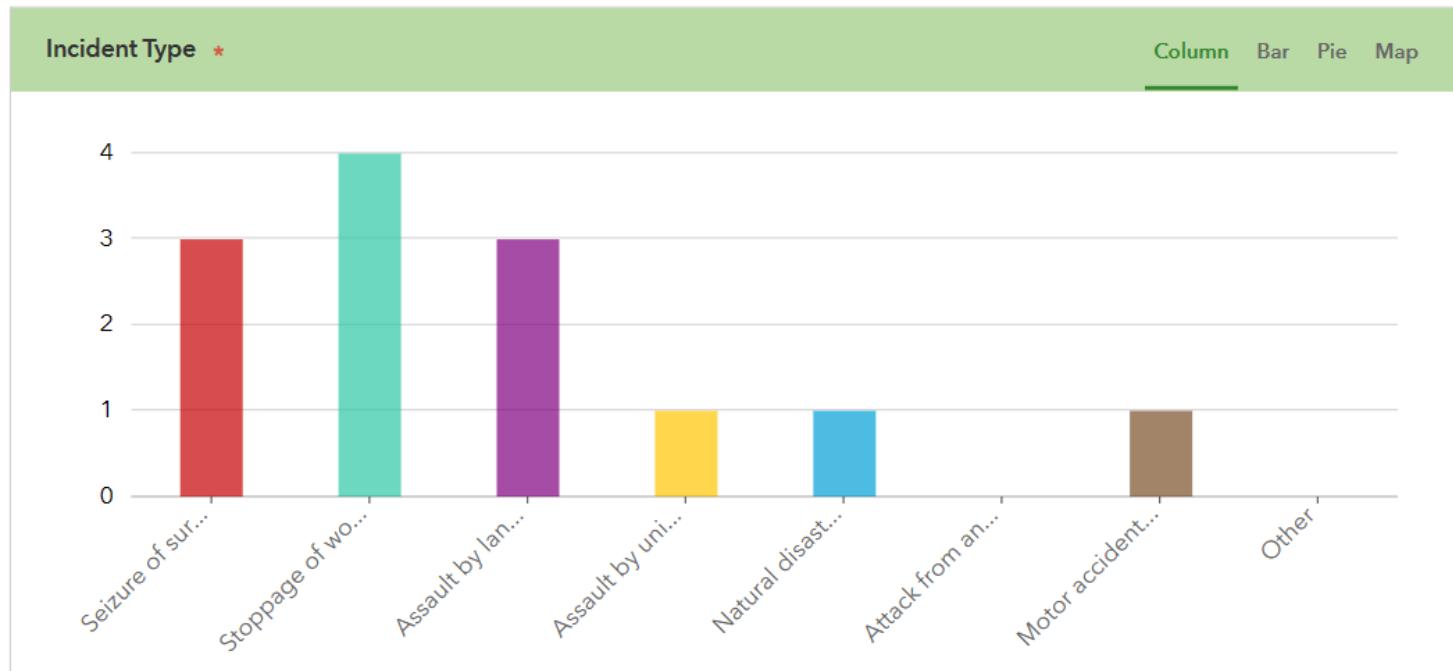
Analyses of reported accidents



- Licensed
- Official
- Student
- Other



- Minor
- Major
- Damage to property



Upload Image/Photo





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CONCLUSION

The study shows the application of using Web GIS specifically ArcGIS Online platform for field accident reporting and warning. This application was created to satisfy the objectives of the study with various functional tools or widgets configured. This application will assist in locating, reporting accidents on the field and give warnings to the surveying fraternity to be safe to avoid any accidents which might occur at these locations.

This application will bring a relief to the land surveying professionals who will want to know each other's welfare on the field.

It will also pre-inform land surveyors about the particular area they are going to work which will aid them to be very cautious and sensitive to the environment.

Thank You

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