Development of Aids to Navigation Information System

A Case Study of Kenya Coast Waters

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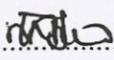A Research Project Submitted in Partial Fulfillment of the Requirements for the Award

of the Degree of Master of Science in Geospatial Information Systems and Remote

Sensing in the Dedan Kimathi University of Technology

2015

DECLARATION

This project is my original work and has not been presented for a degree in any other university.

Signature: .... Date: .....25/03/2015.....

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This project has been submitted for examination with my approval as the university supervisor.

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ABSTRACT

Aids to navigation is an information service facility which is set up to help sea fairing vessels sail safely, economically and expediently by its visual, sound and wireless signals. In Kenya the marine safety along the coast has deteriorated gradually due to destruction, obstructions and lack of aids to navigation. Navigation charts, which are the basic aids to navigation, are still in analogue paper format, making them cumbersome and inefficient for use on board the marine vessels. The aim of the research study was to develop web-based aids to navigation information system for the Kenya's coastal waters. All the published nautical charts covering the coastline and survey plans were used. ArcGIS software was used to digitize and create spatial and non-spatial attributes of the existing aids to navigation. PostGIS for postgreSQL 9.2 was used as a relational database management system where PgAdmin III was used to host the database. Macromedia Dreamweaver 8 was used to develop the web interface. Bitnami WAMPstack was used to hosts the web interface in the local computer. Geoserver was used to develop and host the map interface. Mobile application for the system was developed and hosted by Net beans IDE 7.0. A spatial database, user interface and a mobile application were the results of the development. The research also brought into revelation that most of the physical aids to navigations (beacons and lighthouses) were not functional due to obstruction by built-up developments along the coastline. The developed system facilitates easy updates, maintenance and monitoring of aids to navigation as the various organisations can access the system through the website created. There is need for integration of the aids to navigation system with Automatic Identification System (AIS) for effective marine navigation.

Keywords: Aids to Navigation, GIS, marine navigation, navigation charts.