Analyses of Implementation Data from a Low-Cost Ambulance Service in Ghana

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SUMMARY

Motivation

In the ambulance projects implemented in our study area, Ashaiman, Ghana, the uncertainties and impedances linked to the fleet management system can be minimized by careful consideration of data generated in the initial phase of the system. There is the need to consider two aspects; system operation and spatial data analysis in tandem with the deployment of ambulance vehicles to the project area- to transport patients to clinics and other health facilities and back. This study aims at analysing ambulance request data to do a network analysis to support the operational needs of the system generated. The objectives are to consolidate the user requirements linked to an open-source desktop application and communications channels and to perform analyses of the data generated.

Method

The study region is the municipality of Ashaiman (Ghana) with a focus on the service areas of the ambulances. We measure or observe real-time data attribute information for ambulance operations including response time and location data among others. Road network data and other data layers are incorporated into the system with the location of ambulances supplied by the Global Positioning System receivers installed in the ambulances. Networks provide conduits for sharing material or resources via their links and nodes that connect them. In this study network analysis of the ambulance, location data was carried out based on a road network dataset built from open data sources. We do basic tests of the efficiency of the system to offer opportunities for improvement. Observations of the synergy between the user requirements and the design issues support a more reliable and robust system. User requirements not met may justify software or database creation or updates. An interim database design is proposed for easy retrieval and subsequent analysis which is

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lacking at the moment. The Geovisualisation of geographical data provides visual cues that allow the user to perceive interesting patterns for networks as phenomena. A visualisation of the geodata and network analysis such as location-allocation of health facilities through 2D mapping supports the decision-making.

Results

It is expected that results from the analysis of spatial data will provide options for system optimization. Network analysis of the expected spatial data output from the system can be used to generate maps for visualization purposes. The network analysis on ambulance locations will expose the challenges of the use of the ambulance system within the study region.

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