

DOCTORAL CANDIDATE: Patrick Albert Chikumba
DEGREE: Philosophiae Doctor
FACULTY: The Faculty of Mathematics and Natural Sciences
DEPARTMENT: Department of Informatics
AREA OF EXPERTISE: Geographic Information System in Health
SUPERVISORS: Professor Jens Kaasbøll
Associate Professor Petter Nielsen
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DISSERTATION TITLE: *Geodata Maintenance and Collaboration in GIS Implementation in Health Sector in a Developing Country Context: The Case of DHIS2 GIS in Malawi*

This research has proposed a framework for geodata maintenance in the context of health in developing countries and investigating the contribution of collaboration towards geodata maintenance and the building of local expertise. Geodata maintenance is taken as the combination of administrative and technical actions to keep the dataset up-to-date and as supportive as possible to GIS users; involving actions for assessing demands that bring changes in geodata and those for acquiring and updating geodata. The framework has six administrative and technical actions – (1) identify the need, (2) communication the need, (3) analyse the need, (4) edit the model, (5) acquire the geodata, and (6) edit the dataset. The framework suggests doing the requirements analysis through the first three actions to decide whether to wait, accept or reject the change. If the decision is the acceptance, geodata update is to be carried out through the last three actions.

From the proposed six actions, collaboration can mainly be required in the technical actions – *analyse the need*, *edit the model* and *acquire the geodata* that need the GIS expertise due to the shortage of such skilled personnel in developing countries. Through partnerships the user organisation can access IT/GIS professionals and donations of mainly geodata and finances from the collaborating organisations. Financial constraints and the employment set-up contribute towards the dependence on external environment to access the expertise. The GIS expertise gap that can be reduced through the building capacity of local users for the continuous support in the lifetime of GIS application. The thesis has identified three key opportunities of knowledge sharing – work teams, user training and instruction manuals – that lead to the building of the local GIS expertise and in which collaboration can play a great role.

In the context of GIS implementation, the proposed geodata maintenance framework is viewed as part of the maintenance of an installed GIS to cope with environmental and organisational changes. Once GIS is installed, the user organisation requires the continuing support including the geodata maintenance that consumes the largest portion of

organisational GIS resources. Even when GIS is embedded in another information system like DHIS2 in which the management structure and IT environment are already in place, the setting up of GIS concentrates more on geodata than technology and expertise. Decisions on the enhancement of GIS technology and expertise can be based on the geodata needs.