

Position Paper
Development of a CyberGIS Ontology using the newly re-engineered GIS&T Body of Knowledge Cyber Infrastructure
Sean C. Ahearn, Hunter College – CUNY

A prototype of the cyber infrastructure framework for re-engineering of the GIS & T Body of knowledge has been developed (Ahearn et al., 2013). This new computational framework has at its core a *concept* based ontology represented using semantic web technologies in the Jena framework (Apache Jena Project 2012) and a series of Restful service that are used to interact with the BoKOnto. Maintenance of the ontology is conducted in a bottom-up fashion drawing from domain *actors* (i.e., members of the GIS&T community) in a participatory, collaborative setting where BoK2 concept development, editing, and validation are supported by a semantic visual wiki environment (Ahearn et al., 2013; www.gistbok.org). It also employs analytic components to infer new concepts and relationships through the data mining of knowledge artifacts. These changes are then passed via a web service to the BoKOnto for review and acceptance of concepts in the creation of a authoritative versions (Figure 1).

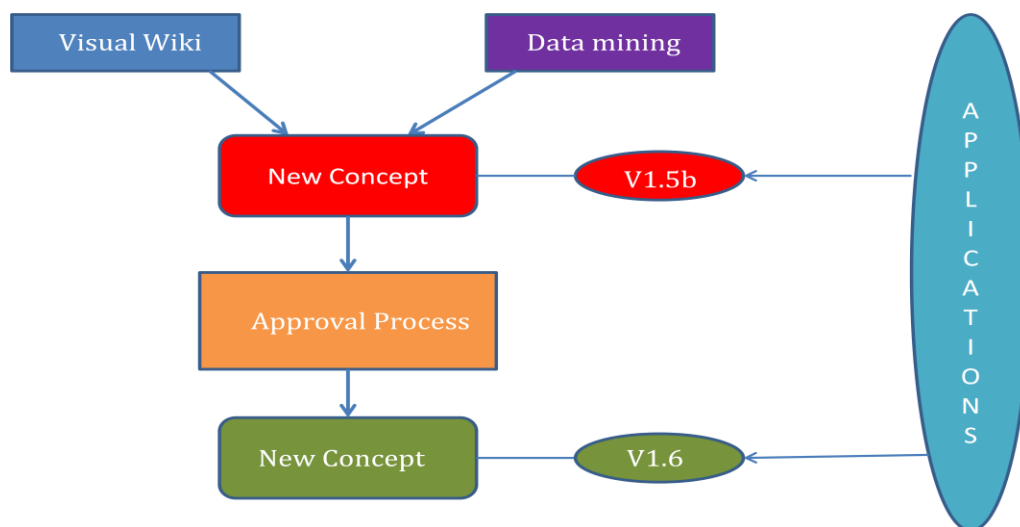


Figure 1: Creating authoritative versions

The approval process could be configured in a number of ways.

- A "top down" approach in which experts in those disciplines review additions/changes to the GIS&T BokOnto to determine what concepts are accepted in the next version (traditional editor).
- Scores for confidence in a new concept and its connections could be generated from the bottom up in a collaborative fashion through assertion and debate by the community (Ahearn et al., 2013) .
- Scores for new concepts could be inferred through data mining of the contributors publications to generate a weight for each concept they wish to add/modify. The concepts parent would be used for the scoring metric.

- Scores could for new concepts could be determined through the nature (confirmation of existing content, correction, or revision) of a contribution (Keßler and de Groot, 2013).

Our proposal is to use the new cyber infrastructure framework (Ahearn et al., 2013) described above to create a new body of knowledge for CyberGIS. Skupin (CyberGIS, 2013) has discussed, in his position paper, approaches to this end.

References

Ahearn, S., I. Icke, R. Datta, B. Plewe, M. DeMere, A. Skupin. (2013) "Re-engineering the Geographic Information System Body of Knowledge" Special Issue on GIS-Cyber-Infrastructure. *International Journal for Geographic Information Science*. Issue 11. Volume 27.

Apache Jena, 2012. Available from: <http://jena.apache.org/>

Keßler and René Theodore Anton de Groot (2013) Trust as a Proxy Measure for the Quality of Volunteered Geographic Information in the Case of OpenStreetMap. In Danny Vandenbroucke, Bénédicte Bucher, and Joep Crompvoets: *Geographic Information Science at the Heart of Europe*. Proceedings the 16th AGILE Conference on Geographic Information Science, 14–17 May 2013, Leuven, Belgium. Springer Lecture Notes in Geoinformation and Cartography 2013: 21–37. PDF: http://carsten.io/wp-content/uploads/papers/kessler-de_groot-agile-2013.pdf