Overcoming the Limitations of Participatory Geographic Information Technologies using the Geospatial Web

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Abstract

This paper argues that the Geospatial Web offers a range of applications and capabilities that overcome many of the aspects that have prevented Participatory GIS from becoming as universally applicable as the practice of participatory mapping. It is established that technologies connected to the Geospatial web have the potential to overcome the four major limitations - technological constraints related to the operation of GIS systems, the cost of establishment and maintenance, access to data, and the capacity of GIS to represent local knowledge – that have traditionally been associated with Participatory GIS. The authors have explored this potential by conducting a pilot study of the usefulness of Web 2.0 technologies for engaging North Okanagan residents and visitors in exploring bicycle routes of the region through an online cycle map, and students at UBC Okanagan in creating and using an online campus sustainability map. Insight gained from this study will be applied to a larger land and water use mapping project that is to be used as a tool in regional planning for the Okanagan basin.

Background and Relevance

Currently, the term 'community participation' is much used because of the widespread and growing recognition that participation of local communities in decision-making is critical to achieving sustainable development (Holmes, 2001; Pratt, 2001). Community participation as an integral component of community planning has gained acceptance because it provides reasonable solutions to the problems of cities and towns, embodying values that, while specific to its efforts, are consonant with the community's values (Hodge, 2008). Within the past 20 years, the use of GIS has proliferated (Obermeyer, 1995) and Leitner et al. (2000 p. 45-47) note that community organizations have become significant GIS users, initiated through their own desire to participate in "building better communities" and influence governmental decision-making. GIS is presently being used as a tool by government, business, NGO's and academia, and Grass Roots Organizations, although less so by local community members themselves. The disproportionate access to GIS by 'professional' groups and organizations has meant that the main focus of research in GIS has been on fine-tuning the technology to suit the current demands of its primary users better. Recent Geospatial technologies associated with the Web 2.0 carry the potential to bridge this gap between technologies that are truly participatory, and end products which can be considered successful. In part, this is because success itself is embedded in the very nature of these emerging technologies, which inherently lend themselves to processes that can enhance "the capacity of

individuals to improve their own lives and facilitate social change," (Cleaver, 1999, p.598) through education and community cohesion. This research examines the ways that emerging Geospatial technologies are overcoming the limitations of earlier GIS technologies, lending themselves more thoroughly to participatory processes.

Methods and Data

In order to test the capacity of emerging Geospatial technologies to address the constraints to participation associated with traditional GIS projects, the research team developed an online sustainability map of the UBC Okanagan campus and cycling routes map of the Greater Vernon area in the North Okanagan. The goal of these mapping projects is to familiarize the research team with the process of using emerging technologies to create online maps without previous experience and to provide a framework for engaging user groups in interacting with these new resources. The team experimented with various freely available, open-access online mapping tools, as well as looking to examples of maps that have been developed for other universities and communities. This pilot mapping project involved the creation of base map layers by the research team, as well as a public participation component whereby the researchers sought contributions from students and community members, which were later incorporated into the online maps. In follow up, the research team evaluated the effectiveness of open-source Geospatial technologies to facilitate the process of simply and effectively representing land-use planning information. The next stage of this research will enhance participation by engaging the general public and targeted user groups in using geospatial technologies for contributing towards data layer development on a regular basis.

Results and Conclusions

Through the process of developing two topical online maps and engaging user groups to interact with them and provide feedback, the project team was able to negotiate a mapping process from different perspectives and backgrounds, in order to participate in developing a common vision. It was determined that, by using new Web 2.0 technologies to represent information relevant to land use planning, we were able to overcome many of the limitations associated with cost, ease of use, accessing data, and accurate representation. However, while these constraints are being at least partially dealt with, the use of emerging Geospatial web applications for participatory mapping projects will inevitably generate new concerns specific to these kinds of technologies, such as the degree of censorship that should be applied, and maintaining the integrity of the map so that it remains an accurate and usable tool for community planning. Further research is required in order to assess the capacity of open source Geospatial technologies to facilitate the integration of publicly contributed data into land use planning maps such as the ones discussed in this study.

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