What Motivates Governments to Adopt the Geospatial Web 2.0?

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Abstract

The Geospatial Web 2.0 (Geoweb) has the potential to transform the ways governments conduct their operations. The Geoweb can be used to mobilize citizens for measuring, monitoring, and managing geo-referenced phenomena. Considerable research is underway on understanding citizen's motivations to volunteer geographic information. We explore what motivates governments to adopt these technologies and content.

Background and Relevance

The Geospatial Web 2.0 (Geoweb) has the potential to transform the ways governments conduct their operations. The Geoweb is that collection of geographic specific Web 2.0 platforms (e.g., Everyblock, Google Earth) and the content enabled by those platforms. The Geoweb can be used to mobilize citizens for measuring, monitoring, and managing geo-referenced phenomena. Since these everyday people have local access to many events and incidents, they can provide near real time information and knowledge. For example, citizens report real time weather data to government agencies and research institutions in Citizen Weather Observer Program (http://www.wxqa.com). At the time of shrinking budgets and resources, governments may be able to maintain their competitive advantage with Geoweb-enabled citizen contribution (also called volunteered geographic information or VGI).

Should governments wish to realize the potential of the Geoweb, they must understand how to attract and retain citizens in investing their skill, time and effort in contributing content. We have some understanding of citizens' motivation (e.g., Coleman et al., 2009; Budhathoki et al., 2010; Budhathoki, 2010). Our interest, and the focus of this paper, is in what motivates government to adopt these new web 2.0 technologies and informational content. To the best our knowledge, no study has investigated the government side of the motivation equation. In this paper, we report initial findings. Since governments are major producers and users of geographic information, their adoption (or rejection) can significantly influence the diffusion and anticipated benefits of the Geoweb. Hence, the Geoweb in government is highly relevant research because it may shape the future production, sharing, and use of geographic information.

Methods and Data

The result reported in this paper is the preliminary outcome of a literature review and analysis of select cases of the Geoweb use in government. As no study has investigated

the Geoweb in government, we are developing a framework and motivational baseline that can subsequently be used to study government's adoption and use of the Geoweb. In the next stages, we will employ both qualitative and quantitative methods for testing/refining the framework with structured interviews of of public sector developers of Geoweb applications.

Results

Governments have traditionally enjoyed their monopoly in the production and provision of geographic information, in part because of an economy of scale (Goodchild et al., 2007). This monopoly has largely continued even after the invention of digital technology including GIS and spatial data infrastructure. As a result of such a monopoly, coupled with the absence of adequate technology for users to interact, scrutinize and challenge the government-sourced geographic information, most governments are accustomed to a one-way supply-driven model of geographic information (Budhathoki et al., 2008). They make assertions depending on what they provide and exercise both legislative and professional authority in doing so.

Governments at all levels—national, state and local—are beginning to show an interest in the Geoweb, a technology that challenges tradition. The Geoweb operates in the absence of conventional authority and trust, an environment markedly different than how governments are used to functioning. Consequently, government's interest in Geoweb appears paradoxical. Even within this paradox, our research shows that governments have motivation for the Geoweb. We briefly describe ten preliminary motivations in the following paragraphs.

Government does not have knowledge and resources to tackle problems unilaterally. According to Stoker (1998, 26),"[g]overnance means living with uncertainty and designing our institutions in a way that recognizes both the potentials and limitations of human knowledge and understanding". Hence, governments will be motivated to use the Geoweb to *capitalize on citizen input as a way of broadening extending their knowledge base*. Challenge.gov (http://www.challenge.gov) exemplifies this point. Challenge.gov calls on citizens to contribute information to the government for collaboratively solving problems. Similarly, the US Geological Survey has begun to explore the potentials of citizen inputs in mapping (http://cegis.usgs.gov/vgi/). The recognition of the value of citizen contributions constitutes a remarkable shift from top-down governance approaches and, digitally, is enabled by the Web 2.0 read-write web.

Governments are often considered laggards in adopting innovation and there is pressure for them to show modernity or progressivity. Governments do compete with each other for resources and jobs, particularly municipal governments and innovation allows them to show a competitive advantage, for example to attract knowledge workers. Similarly governments are under some pressure from their constituents to catch up with their rapid adoption of Web 2.0. Thus governments may adopt the Geoweb to *demonstrate innovation.* Innovations such as Web 2.0-enabled applications and data fusion can offer new way to deliver services, for example San Jose, CA, USA's provision of Keyhole

Markup Language (KML) files of its planning data (http://www.sanjoseca.gov/planning/data).

As citizens gain access—and get accustomed—to the Geoweb such as Google Maps services, they will likely expect the same from governments. Governments, particularly democratic ones, have to *be responsive to citizen demand*. This demand may act as a powerful motivation for governments to adopt and use the Geoweb. In a sense the citizen here is seen as a consumer and the web as the enabler of addressing that customer base and revamping their service delivery (Deloitte Research, 2000). Deloitte Research argues this bottom-up responding to citizens will more likely lead to service improvements than top-down legislative mandates. This demand will not be homogeneous. A hallmark of Web 2.0 is its supposed responsiveness to the long-tail of individuals' needs, needs that are not met by majority issues dominated distribution mechanisms of Web 1.0 (O'Reilley, 2005). Heretofore, we have posited that motivations have positive connotations. Treating constituents like consumers is very much a neoliberal response, where governments are expected to behave like businesses and should respond to the same efficiencies drivers as the private sector.

Efficiencies like cost minimization as well as performance enhancement are perpetual concerns for governments (Lynn et al., 2000). Web 2.0 promises that governments can do more with less. The Apps for Democracy project in Washington, DC, is estimated to have returned 50 times more value than the cost invested (http://www.appsfordemocracy.org/about/). Utilizing citizen-created data and applications—which are free or can be created with much lower cost—can allow governments to reduce their own data collection. Ironically, increased digitalization of societies actually increases strain on government resources, as it requires greater expenditures on digital technologies. Nonetheless, governments may be motivated towards the Geoweb as a means to *optimize and redirect their limited resources* to activities of public benefit. Mayo and Steinberg (2007) recommend that the U.K. government investigate existing websites, data and apps before it develops its own.

Governments may view the Geoweb as a new tool to *enact/respond to regulation* as part of their mandates or their standard operating procedure. For example, building inspectors are beginning to use Google Maps as a reference images to ensure that they go to the correct building. In Greece, officials have caught tax-evaders by using these same images to identify undeclared swimming pools (Yahoo! News, August 14, 2010). Certain of these uses verge on threats to privacy (Krumm 2009); governments might nevertheless see the potential for the Geoweb in these uses.

It is beyond the capacity of individual agencies to address pressing and complex public issues, from climate change to terrorism. GIS has already been found to be an effective means to exchange geospatial information across agencies (Nedović-Budić, 2004), although challenges remain in interoperability. As intra- and inter-organizational collaboration becomes increasingly important (Dovey & Eggers, 2008) and as the Geoweb promises to surmount these interoperability challenges, governments will find the Geoweb to *further intra- and inter-agency collaboration.*

A major character of a democratic government is to ensure that its citizens have opportunity to participate in political and policy discourse (Moon, 2002; Shrier, 2008). The visual power of maps and the ease-of-use of the Geoweb may provide ample opportunity for governments to establish or strengthen two-way conversations with citizens (Ganapati, 2010). Governments may wish to use the Geoweb to *empower and engage citizenry*. This motivation hearkens back to original debates about the empowerment potential of GIS (Sieber, 2006), for example, that empowerment and democratization potentials of GIS were illusions or diversions from realpolitik (Pickles 1995).

Lobby groups wish to be similarly empowered to influence public policies in their favour. Kakabadse et al. (2003, 48) contend that "[t]he imbalance created by lobbying is probably one of the most serious issues confronting current liberal representative democracy models". Disintermediation has long been a hallmark of Internet applications—if geospatial information was made more directly available to the public then it may be potentially less susceptible to distortion and filtration. Governments may use the Geoweb as a tool to *minimize the role of intermediaries (disintermediate) and lobbyists*. For example, U.S. President Obama highlighted lobbyist influence as one of the major issues in 2008 election campaign and the attempts to use Web 2.0 by his administration can be seen as a technique to minimize intermediaries and directly address the people.

The Geoweb may *contribute to open government*, making government activities more transparent (Ganapati, 2010). The concept of increased transparency in government borrows ideas from Open Source Software and other open movements, that government is DIY (Do It Yourself). In such a model of an open and a network model of governance, decision making presumably improves as many eyeballs examine the data to ensure quality of local content, either through feedback, updates or new ideas for data (Eynon & Dutton, 2007; Rhodes, 1996). Apps for New South Wales in Australia refers to it as unlocking the potential of government information (http://www.information.nsw.gov.au/apps4nsw). Indeed, this is very much what originally drove the release of GIS data: where data became recognized as an end in itself and not necessarily a means to the end of policy making (Onsrud et al., 2004).

A tool of expression can also be used for repression. According to the HerdictWeb, Tunisian government's online censorship reached an apex in the weeks of the recent political unrest (http://www.herdict.org/). Governments may *use the Geoweb as a tool of repression* to its citizens or certain groups or individuals. As the Geoweb provides people' movement in space and time, it can offer means of surveillance for government (Morozov 2011).

Conclusions

Literature suggests that the government's adoption of the Geoweb is driven by wide range of endogenous and exogenous factors. As the Geoweb is much easier to use than

the technologies of desktop and the Internet GIS* of 1980s and 90s, governments' adoption of this emerging geospatial paradigm will largely depend on how well we understand and address motivational issues. Even after understanding government motivations, we anticipate that this new form of public participation will likely collide, for example, in terms of data accuracy and precision, consistency, and authenticity, with the existing institutional processes. Unless governments devise means to reinvent institutional frameworks and organizational practices, Geoweb implementation in government will be a challenge.

We have painted a largely positive picture of the adoption of the Geoweb. As we began to suggest above, the Geoweb could just as easily be turned to, for example, surveil the public or respond to neoliberal impulses in governance. Also, we expect new motivations to emerge as we conduct our research. Further research is required to best understand these varied factors.

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* It is a testable hypothesis on how much successful government adoption of the Geoweb depends upon the .shp or .tab files developed by traditional GIS.

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