The GeoWeb 2.0 and the new generation of PPGIS

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Abstract

The Web is peppered with spatial references mapping and location based content is defined under the term Geospatial Web or GeoWeb. This rich melange of spatial data and service offers many opportunities and represent one of the future paths of the Internet Platform. The GeoWeb survey took the last two years as a participatory, following the progress of the phenomenon of Web 2.0. From now on, maps and geolocation content are ubiquitous on Internet and all user can make cartography and create geographic information. Some people do not hesitate to characterize these variation of the Web under different terms such as *Maps 2.0* (Crampton, 2008), *mapping 2.0* (Hay, 2008), *GIS 2.0* (Joliveau, 2008), *neogeography* (Turner, 2006) or *GeoWeb 2.0* (Maguire, 2007). Beyond terminology, the GeoWeb 2.0 is above all other a new dynamic and interactive consultation, management, processing, creation and dissemination of geographic information online. It offers all kinds of audiences, how to superimpose traditional maps, information and services, thus improving substantially the value of the maps. On one side, the technologies and practices converge and space comes together in a complementary perspective. On the other side, this new practice is helping the Web to evolve into a more advanced and more mature socialization tool (Openness - Peering-Sharing and Acting globally) (Tapscott & Williams, 2007). This new form of online mapping where interactivity is as important as the content allows everyone to read but to write the maps. This user generated content is call; Volunteered Geographic Information (Goodchild, 2007a) or Geographic User Generated Content (Goodchild, 2008). The potential impact of this phenomenon is considerable for all professionals in the geographic information, the geospatial industry, local authorities, developers or users of the Internet who are also citizens. The GeoWeb changed the face of geomatics by making it more accessible and understandable to the general public.

Background and Relevance

The first element of this research is based on the idea that there are two cohabiting models of Geomatics. One is more professional, owner base, specialized and is more restricted to experts. It is positioned as management information, as a professional support for decision making or technical communication tool. Another is more personal or public and more open, it composes and shared positions within itself as a tool for communication and multidirectional information (Joliveau, 2008). In the same optic, we can make three types of online digital mapping (Hay, 2007). The first is the model of the GIS mapping where the map is positioned as a tool for planning and decision support. The second is the Webmapping 1.0. In this case, the map is a tool for information and communication. The third model, the mapping 2.0 is characterized by Volunteered Geographic Information (VGI) produced and published by users, and where the map is a tool for interaction and participation.

That was the idea of the map seen as a wiki (Sui, 2008), after having been seen as a communication tool, as a tool of power. These maps are now interactive by and for all users, it is dynamic both in design and in content. Geospatial technologies 2.0 (mapping mashups and APIs, Mapplets services delivered online, GPS) now allow users to learn and map the (their) world. In this context we see the genesis of a process of production, collection, updating and dissemination of geographic information running on a bottom-up approach and based on the model of crowdsourcing (outsourcing), which generalizes in Web 2.0. Examples of crowdsourcing and more specifically geocrowdsourcing increase (Google Maps maker, Open Street Map, locally based services). With services like online mapping GeoCommons, Zee Maps or Navxbeta, any user is able to create, manage and disseminate geographic information. From simple information to the collaboration through consultation or contribution (Arstein, 1969), there are varying degrees of participation.

Over the past ten years, regulatory frameworks for the participation of citizens in local politics are changing. Citizens are increasingly involved in decision-making concerning the management and planning of their territories. With the growing environmental problems and the concept of sustainable development, the public participation is also the generic term for *participatory democracy*. In this context of new demand for transparency, participation and access to information (Cunha & Dao, 2005), new laws are created in different layer of society (international, national and local level). The participation and involvement of citizens are becoming as to access to information is subject to different legal obligations. The institutionalization of public participation in the framework of management and spatial planning (Guay, 2008) requires communities to respect the legal framework in place. They must change and adapt their policies to access and dissemination of geographic information and at the same time offer new tools and mechanisms to involve participation of citizens in the collective decision-making.

The convergence of factors discussed above poses new problems for research both in the field of geomatics and geography. We assume that the phenomenon of Géoweb 2.0 is to consider beyond a simple democratization of geospatial technology by the simple process of extension of customs and practices. A recent study asserts that "*the growth of online mapping highlights the current thinking of communities to Georeferenced data, both for their own use as part of their missions of public interest*" (Jarnac, 2008). We believe that new technologies and practices of Géoweb 2.0 renew the approach the issue of public participation and indeed, that of collecting PPGIS. It is therefore appropriate to identify how these new technologies, new content, but these new practices can act as a link between users, people who adopt, use and develop technologies that were previously only professionals in creating geographic information. And communities who need to bring forward these new expectations for citizens and new legal framework and legislation in the area of public participation planning. Knowledge about the phenomenon of GeoWeb 2.0 is still in development but the interest shown by the scientific community as the geospatial industry is rapidly developing. The phenomenon is too recent for theories to be truly established and a consensus is still to be found in the vocabulary. Many aspects of this phenomenon remain unclear, reactions and positions within the sphere of Internet are growing, so that publications on the subject are beginning to emerge. We can cite as references to this research, the works of Kingston, Nyerges and Elwood about the link between Web 2.0, VGI and PPGIS (Elwood, 2007a ; Elwood, 2007b ;

Elwood, 2008a ; Elwood, 2008b ; Kingston et Smith, 2007 ; Nyerges, 2007). But also the works of Turner about Neogeography (Turner, 2006) and NCGIA about VGI (Goodchild, 2007a, Goodchild, 2007b, Goodchild, 2008, Maguire, 2007, Kuhn, 2007).

Methods

This research is structured in two parts, each with their own methodology. In a first exploratory research follows an inductive type based on the *Grounded Theory*. This methodological approach has the qualitative purpose of generating new theories base on evidence (Glaser, 1992). Empirical data will serve as a starting point for developing a new theory about a phenomenon. Based on findings and observations (readings, web crawling, testing of existing solutions, semi-directed), the objective is to build a new theory on the use of 2.0 geospatial technologies and geographic information in this voluntary geocollaboration processes and participation. To summarize, this first part of the research is divided into five stages. The first is to collect data and observe the facts. In a second step is to combine the observations in points (*code*) that can identify the theoretical anchors. The third step is to combine these codes concepts (*collections*). From this information we go to step four, and are able to train large groups with similar concepts (new practices, new users, new geographic information, new logic of production and distribution). The last step is to achieve a theory that positioned itself as a collection of theory and fact that explain the object of research and also the problems and assumptions. In the second phase of the project, the focus will be on case studies (like laboratory space) in a hypothetical-deductive method. The theories and hypothesis will be produced before facing the ground. These case studies, according to the method proposed by Yin (Yin, 2000), based on a triangulation of sources involving interviews, analysis, speeches and reports, as well as *in situ* observations.

Objectives and research questions

At this stage of this research, I describe the research objectives which are of two types. On one side there are objective of a scientist who focuses on the development of new knowledge about the effects of GeoWeb 2.0 on the interactions between local authorities, citizen and geospatial technologies. Many theoretical and conceptual research questions seem relevant. The news spatial practices based on interaction, participation and networking have most probably an impact on the policies and practices of geographic information of local organizations. Similarly, it seems pertinent to ask whether VGI and other user generated contents are not new ways to involve citizens in less formal than those of PPGIS ? So to what extent these non-organized from the top could not be used by communities to feed their own databases and also use their thoughts on the management and planning of their territory? How the access, availability and widespread use of VGI and geospatial technologies 2.0 can change the relationship between public organization and citizens? News logical and players will they appear in the decision making process? How do these non-factual data can be integrated into GIS-based organizations and used as part of the planning process? And more broadly, virtual globes and maps API they embody new spaces of citizenship?

The second objective is more operational, it aims to synthesize new knowledge on the GeoWeb 2.0 to create a guide for the proper use of GeoWeb 2.0 technologies and *User Generated Geographic Content* to local authorities. The goal is to better inform policy makers and experts on the initiatives put in place (available techniques, possible projects, examples, protocol development, legal point) in order to respond appropriately and consistent with the expectations of citizens for information and participation and also the growing needs of communities in terms of methods and instruments of public participation. This study aims a prescriptive dimension that can only take place after a long period of observation which will materialize in the form of suggestions and recommendations. We believe that the creation of composite applications in order to engage citizens and create the need to have goals in the deployment of tools and good communication on the implementation of these services. Creating a guide that will educate, inform and provide advice to communities that wish to use the potential of GeoWeb 2.0.

Conclusions

The GeoWeb 2.0 changes the logical set; all Internet users can make geomatics. The data that traditionally came from central government are now produced by users who are also citizens. But beyond the size of recreational GeoWeb 2.0 (geocaching, community of POIs, OpenStreetMap), we believe that the potential impacts are more global. The philosophy 2.0 and new the logic of contribution and participation have an impact on decision-making process. It seems important to see how PPGIS will adapt to this new kind of mapping. The GeoWeb 2.0 offers a tool box for a true geocollaboration; the aim is to work in conjunction with geographic information to determine together future of the territory. With the democratization of geospatial technologies and volunteered geographic information, we believe that a new generation of PPGIS is possible.

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