Social SDI's: a Challenge for Land Surveyors

Mabel ÁLVAREZ, Tatiana DELGADO FERNÁNDEZ and Rafael CRUZ IGLESIAS

SUMMARY

The paper is about SDI from a social point of view and includes:
Contributions from the Project CYTED 606PI0294, titled "Evaluation and Strengthening of Spatial Data Infrastructure for sustainable development in Latin-America and the Caribbean" (IDEDES)".
Social networks and the need of capacity building to interact in them.
The social role of Land Surveyors and the need of capacity building in Web 2.0 and 3.0 tools and concepts.
Benefits of including Web 2.0 and Web 3.0 in the Continuing Professional Development Programs.
Some proposals aimed at the SDI development for a social approach and the role that Land Surveyors can play, through their active participation in social networks.

RESUMEN

El paper refiere a las IDE desde un enfoque social. El mismo incluye:
Aportaciones al tema desde el Project CYTED 606PI0294, IDEDES (2006- 2009) titulado "Evaluación y potenciación de las Infraestructuras de Datos Espaciales para el desarrollo sostenible de América Latina y Caribe" (IDEDES).
Las redes sociales y la necesidad de formación de capacidades para interactuar en ellas.
La función social del Agrimensor y las necesidades de formación de capacidades en conceptos y herramientas Web 2.0 y 3.0, para participar activamente en redes sociales.
Beneficios de incluir conceptos y herramientas Web 2.0 y Web 3.0 en los Programas de Formación Profesional Continua (CPD).
El paper concluye con algunas propuestas orientadas al desarrollo de las IDE desde un enfoque social y al rol que pueden desempeñar los Agrimensores, a través de su activa participación en redes sociales.

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1. INTRODUCTION

In modern society there is an increasing volume of information that is considering critical for daily decisions making. Because every time there is more information "on-line" that includes some geographical context, the skill to discover and to access geographical information resources, for use in visualization, planning and decisions making, it is an indispensable requisite to support the society.(Nebert, 2004).

An Spatial Data Infrastructure (SDI) includes policies, technologies, standards and human resources necessary for the effective compilation, management, access, delivery and use of the spatial information at different levels according to economical, political and social decisions making, and of sustainable development (Delgado, 2007). An SDI must be more than a simple set of data. It host geographical information and attributes, complementary documents (metadata), a way to discover, to visualize and to evaluate the information (catalogues and cartography in Web), and some methods to deal with geographical data.

Nowadays several geospatial applications are beginning to change their approach, shifting from isolated GIS application to Web Services provided from the SDI. This is an important step in order to share the geographical information for decisions making in an collaborative enviroment at interinstitutional level. The use of SDI services made possible the fast implementation of complex tools, and consequently the reduction of data duplication, the possibility to save resources and the simplification of the cartography and future services.

At national level the National Commission of Spatial Data Infrastructure of the Republic of Cuba (CIDERC) has given important steps to deliver information and services in support to decisions making with an important geospatial component. Nevertheless, this process must be continued. It is a need to decentralize and expand it towards the provinces and municipalities, in order to achieve a harmonic work for sharing the most quantity of geographical data in favor of communities and citizens.

At local level it is necessary to provide resources that allow incorporation of more and more users in the process of development of information and communication technologies of proper society and in this context it is necessary to stimulate geoinformation sector.

The culture of the Web 2.0 is diversifying in products driven user that every time are more popular (Wikis, Youtube, Blogs, BitTorrent), and recently in products driven to Geomatics (Google Earth, Google Maps, MapTube, WikiMap, ShapeWiki).

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Surveyors graduates in recent years have received their university education with new technologies, but a critical mass of surveyors, graduated years ago, have not received this training. The latter require more attention in training on Web 2.0 and 3.0 concepts and tools.

2. SOCIAL SDI´s

Social SDI's is an approach of the Spatial Data Infrastructures that has become relevant in recent years, influenced by the evolution of SDI and the new Web possibilities.

2.1 SDI´s evolution

Since the late 80's SDI has been proposed as a way to promote Geographic Information (GI) use. The idea is that through co-ordination and documentation, SDI would make the access to GI easier both by professionals and common citizens (Gouveia C., 2007). Nevertheless that spatial data is still inherently difficult to share and visualize for the non-GIS trained academic or professional (Hudson-Smith, 2008).

Once the Web 2.0 concepts are applied to the area of Spatial Data Infrastructures, we can speak about a SDI 2.0 as next evolutionary step from SDI 1.0. In SDI 2.0 new projects go beyond simple visualization of cartography, integrating data contributed by users in his new role of users - providers (Rodríguez, 2008).

Due to the release of Web 2.0, the SDI has been moving from a vision centered on provider to other one centered on user, which contributes to a better appreciation of GI for big public. As a consequence, there are a new emerging terms related to geographical professions such as voluntary geographical information, crowdsourcing and neogeography.

In these moments in which the society needs from more cartography, the users appear as an interesting option at time of adding information on basic cartographic, bearing in mind that is necessary to separate both types of information, that of reference, trustworthy and exact inside his limits, and the added one, without formal guarantees but very usefully in majority of occasions. It does not turn out to be crazy that, on the topographic map of a city, the citizens are loading place of bars, restaurants, pharmacies, cinemas, libraries, … according to his interests and love; meanwhile they label the world with a folksonomy (Rodríguez, 2008).

SDI 2.0 must be opened for collaboration of users' data, facilitating to him mechanisms and tools so that he could publish his cartography using interoperable services. This is conceived as one "Architecture of Participation" that is so much social as technical. The skills and energy of users has to be enhanced as much as possible, in order to build something bigger than any single person or organization could do alone.

In the relation between social and technical aspect imposes a question of first order on itself: in what world do we live and in that world we will live? It is necessary to know where we want to come as society to choose the actions and policies that lead that science and technology should be constituted in a common good and allow obtaining quality of life and

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equity. Inside fifteen global challenges identified up to the moment for the United Nations there is one closely related to this topic: how will be able the global convergence of technologies of the information and communication to be beneficial for everyone? (Scheunemann, 2007).

It is not possible to simply focus on one, to take the other as a given. Community won't work right if the technical doesn't support it properly (can't make it too hard to participate). Technical can't do anything if there's no community (can't just build and assume people will come) (Holmes, 2008).

Traditionally, most of spatial information has been captured, processed and published by public sector agencies. In this sense, first SDIs have evolved as the way to share public sector´s geospatial information, giving to private and other sectors an increasing role in the last decade.

Spatial Data Infrastructures emerge almost two decades ago based on pre-existing infrastructures as the WWW, and due to the increasing need of the society to use shared geospatial information. The first initiatives were generated with a data-centric and top down approach. However while the SDI were evolving towards a user oriented process, the need to develop bottom up SDI was progressing too (Delgado & Cruz, 2009).

While the top down vision emphasizes the need for standardization and uniformity the bottom up vision stresses the importance of diversity and heterogeneity given the very different aspirations of the various stakeholders and the resources that are at their disposal (Masser, 2006). The future of Spatial Data Infrastructures therefore lies in creating capacity at the municipal level so that these Municipal SDIs can emerge and spread from the middle out, gradually filling in the tassels of the greater (regional, national) spatial puzzle (Carrera & Ferreira, 2007).

 In recent years, the web and platforms such as Google Earth and Virtual Earth have motivated individuals from all walks of life to explore, utilize, and increasingly share spatially related data to friends and the wider community. Volunteered geographic or spatial information is part of a growing phenomenon which closely parallels the developments in online social networking (McDougall, 2009).In consequence, Social SDIs are aimed to take into account also the spatial information produced and published by users.

For De Man, information infrastructures – and thus SDIs – are socio-technical actor networks of human actors, technological artefacts and informational artefacts (data and information). This perspective views the process of developing information infrastructures as emerging out of interplay between heterogeneous actors – human actors and technological and informational artefacts tied together in actor-networks and continuously negotiating and aligning various interests. Understanding SDI – or any information infrastructure for that matter – as actor network may help in tracing the multitude of diverse interests that have to be aligned. (De Man, 2007).

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In the last years the Web evolution is also oriented to Web 3.0 where semantics and ontologies play an important rol.

2.2 Contributions from the IDEDES Project

During last four years (2006-2009), eight countries from Iberian-America were working together in a project entitled "Evaluation and strengthening of Spatial Data Infrastructure for sustainable development in Latin-America and the Caribbean" (IDEDES). This project was developed into the framework of an Iberian-American Program of Science and Technology for Development (CYTED) and its main objective was to make a bridge between users and producers of SDIs in the region by means of the creation of a family of domain ontologies for sustainable development and the corresponding semantic services. The most significant result was the integration reached by experts from sustainable development, spatial data infrastructure and ontologies becoming in a richer kind of professional. Other results were evaluations of SDI Readiness in the countries of the region, a new semantic service to be added to the traditional SDIs services and several sustainable development domain ontologies. All of them have been compiled in 2 books, and diverse publications delivered by the project.

The last stage of IDEDES was focus of the impact of SDI to local development, so the future work should be projected to Semantic Social SDIs. Some experiences as SDI in the Villa Clara´s Province in Cuba, as well as other scenarios in Amazonia and Eje Cafetalerio in Colombia, among others were the starting point to develop new methodologies to create effective local (social) SDIs in Latin-America and the Caribbean.

3 SOCIAL NETWORKS

Social networks can be defined as: online communities where people meet, socialize, exchange digital files, etc. These can become learning communities or networks of knowledge (knowledge networking). Some popular examples of social networks are Facebook and MySpace.

Social networks are one of the most powerful and innovative social structures for on-line work. A science has been created around the concept of "networks", which implies both analysis of graphs and social networks with metric systems, as well as software for analyzing these social networks.

At the beginning, social networks were created for informal communication. They were thought as applications to be used in spare time. But, an important potential was hidden. They could be used with other objectives, for example the creation of new markets.
Many companies noticed that it is important to be into the social networks. It means to achieve immediate visibility, with no geographical limits, and also the possibility of direct communication.

These opportunities are very attractive for business, but, there are still some obstacles like the digital gap. This digital gap gathers the connectivity limitations and the minimum of digital culture knowledge that is necessary to use these technologies.

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According to (Davis & Mintz, 2009) it is possible to distinguish some social web applications characteristics, as follows:

- User-generated social content. Social web applications enable site visitors to submit content that others can access, such as photos, their own profile data, links to other websites, and comments on other users' content.
- Social networking. Users of social web applications join together in online groups and relationships (e.g. friends), which allow them to see identity-related information about the people to whom they are connected.
- Collaboration. Users engage in conversations, co-creation of content (e.g. on wikis), collaborative filtering, and collective action.
- Cross-platform data sharing. Increasingly, sharing content requires that a user be able to transfer data across sites, implying that the site on which the remote content is to be shared can interface correctly with the other site's data. When the remote data need to be processed locally, the two sites must agree on its meaning, which is a defining characteristic of the semantic Web.

3.1 Need of Capacity Building

According to (Groot and Moolen, 2001) Capacity Building is:
The development of knowledge, skills and attitudes in individuals and groups of people relevant in the design, development and maintenance of institutional and operational infrastructures and processes that are locally meaningful.

This is a 2001 definition. Since then, the WWW and the virtual environments for teaching, learning and social interaction have suffered an important evolution.
Since this evolution took place, it is usual to talk about e-competences, not just plain capabilities.

The study "Capacity for Development-New Solutions to Old Problems" United Nations Development Program (2002) includes the present paradigm and the new paradigm, as follows:

	Current paradigma	New paradigm
Nature of development	Improvements in economic and social conditions	Societal transformation, including building of "right capacities"
Conditions for effective Development cooperation	Good policies that can be externally prescribed	Good policies that have to be home-grown
The asymmetric donor recipient relationship	Should be countered generally through a spirit of partnership and mutual respect	Should be specifically addressed as a problem by taking countervailing measures

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| Capacity development	Human resource evelopment combined with stronger institutions	Three cross-linked layers of capacity: societal, institutional and individual
Acquisition of knowledge	Knowledge can be transferred	Knowledge can be acquired
Most important forms of Knowledge	Knowledge developed in the North for export to the South	Local knowledge combined with knowledge acquired from other countries – in the South or the North.

A New Capacity Building Paradigm (UNDP 2002).

A New Paradigm Capacity Building (UNDP 2002) is mentioned by (Enemark, 2006) in his paper entitled Capacity Building for Institutional Development in Surveying and Land Management . In the final Remark of the paper he mentions:

"it is recognised that capacity building for institutional development is crucial especially in the context of a developing country".
"Finally, the paper argues that FIG has a key role to play in this regard".

As expressed by (Cobo Romaní, 2009) in a recent study the e-competences involve: E-Awareness, Informational Literacy, Technology Literacy, Digital Literacy and Media Literacy.
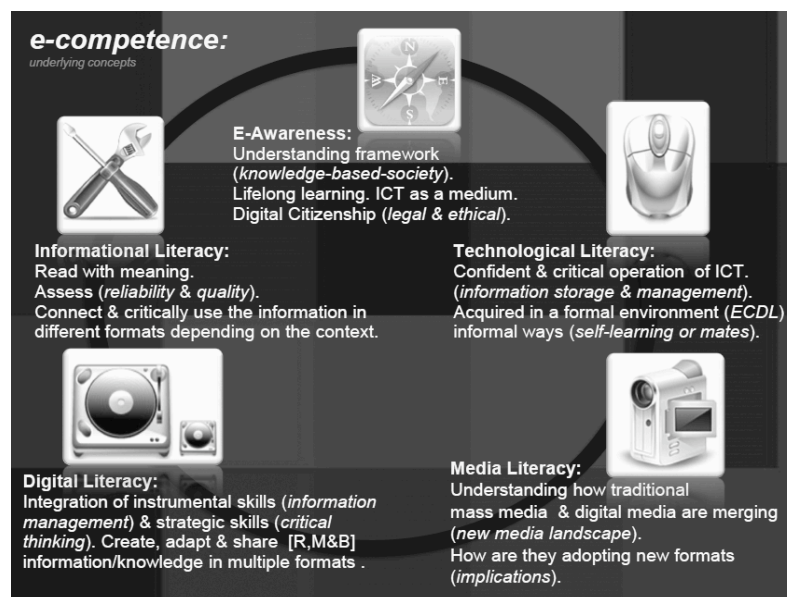
e_competence (Cobo Romaní, 2009)

These e-competences are valid for all the people, no matter their occupation or where they live.
Nowadays, capacity building is linked with the possibilities that are offered by the Web. Having this in mind, the evolution of the Web creates more topics in capacity building.

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4. THE SOCIAL ROLE OF THE LAND SURVEYORS AND THE NEED OF CAPACITY BUILDING IN WEB 2.0 AND 3.0

Land Surveyors have a relevant role in the society, independently from the place where they live or work. They have traditionally worked mostly with citizens and sectors related to the scope of their profession. Due to the characteristics of this profession, their work takes place anywhere (urban areas, rural areas, etc.).

(Enemark.S, 2006) says that FIG can facilitate support for capacity development in the three following ways, which are of course interrelated and interdependent:

Profesional Development
FIG provides a global forum for discussion and exchange of experiences and new developments between member countries and between individual professionals in the broad areas of surveying and mapping, spatial information management, and land management. This relates to the FIG anual conferences, the FIG regional conferences, and the work of the technical commissions within their working groups and commission seminars.

Institutional development

FIG provides institutional support to individual member countries or regions with regard to developing the basic capacity in temrs of educactional programs ande professional organisations.

Global development
FIG also provides a global forum for institutional development through cooperation with international NGO´s such as the United Nations Agencies (UNDP, UNEP, FAO, HABITAT), the Wolrd Bank, and sister organizations (GSDI, IAG, ICA, IHO, and ISPRS).

The evolution of technology in the last decades has created substantial changes to the professional practice of Surveyors. These changes include, among others, issues such as:
- Technologies for capturing and processing field data.
- Computer Aidded Design (CAD), Land Information Systems (LIS) and Geographic Information Systems (GIS).
- Internet and possibilities given by the WWW:
    – Spatial Data Infrastructure (SDI)
    – Social Networks.
    – Web 2.0 and Web 3.0 tools and concepts.

Capacity building in topics such as SDI, Social Networks, Web 2.0 and Web 3.0 tools and concepts, should be considered especially in developing countries and countries in transition.

Currently the lack of personnel trained in Web 2.0 is a common problem in several places and scenarios. This situation is focused in several ways, including research projects. For example, the research project (started in January 2010) "Training and knowledge management tools for

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Web 2.0 university teaching, administrative and educational management in rural communities and CPD in Argentina, Chile and Ecuador", financed by AECI-Spain, under the direction of the Universidad Nacional de Educacion a Distancia - Madrid (Spain) and with the participation of the Universidad Nacional de la Patagonia San Juan Bosco - Argentina, Universidad de Concepción - Chile and Escuela Politécnica del Ejército- Ecuador.

Land Surveying is a profession, with relevancy around the World, and FIG has a whole engine working for these purposes.
(Magel, et al 2009) regarding to FIG says, that it is therefore recommended that a special Working Group on 'Global Academic Partnership for Sustainable Land Management' within 'Commission 2: Professional Education' should be established in the near future. The authors suggest that the partnership and above mentioned Working Group should be constructed or started on the basis of six main interrelated targets: **Joint research, Exchange of knowledge on land issues, Exchange of teachers and students, Mobilization of financial resources, Exchange of partners' network and Development of management capacity of partner institutions.**

The FIG website, publications, the month's article and the Newsletter are general types of communication channels that are used by this NGO.
The regional events that are carried out by FIG are intended to focus in the particular characteristics of each region, like Europe, or Asia and the Pacific, for example.

4.1 CPD Programs in WEB 2.0 and 3.0 context

The CPD Programmes have been considered by FIG some time ago. There is for example the 15th FIG Publication from 1996 entitled: " Continuing Professional Development".
The CPD is a growing need to meet the demands of today's society.
The evolution of the Web, since the static 1.0 Web to the bi-directionality 2.0 Web and the path to the 3.0 Web involves aspects that enhance the Web and make it more useful and friendly to the user, offering more resources.

4.2 Benefits of including Web 2.0 and Web 3.0 in the CPD Programs

Training in Web 2.0 will help to reduce the gap between the e-skilled and the non e-skilled persons.
Part of the Land surveyors in practice need to be trained in Web 2.0 and 3.0. Achieving these capabilities will enable them to share their knowledge and feed back of resources and interactions that allows the Web.

CPD programs in Web 2.0 environment will become more attractive and accessible.

Land Surveyors trained in aspects related to Web 2.0 and 3.0 will be more interested in CPD programs offered through E-Learning or Blended Learning.

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5. SOCIAL SDI AND LAND SURVEYORS

This paper focuses on the description of Social SDIs based on the ideas expressed by Delgado&Cruz on the hybrid top down and bottom up SDI approach (Delgado & Cruz, 2009):

- "Coordination of the heterogeneity" - Facilitation of the inclusion of new active networks and stakeholders in the SDI.
- "Coordination of the diversity" - Users become providers - Sufficient flexibility to permit different ways to share data; ease to use and the ability to communicate via freely available tools.
- "Validation of contributions"- To consider reputation management mechanisms.
- "Use of legal frameworks and standardization from top down SDIs" - To take advantage of the protocols, guidelines, standards and lessons learnt by top down initiatives in conjunction with the flexibility associated to bottom up approach.
- "Aggregating values from neogeographers contributions" - To enable mix and match maps from different sources (formal SDI generated maps and informal user generated maps).

With this in mind, there are many opportunities and also challenges for Land surveyors oriented to carrying out new tasks into the framework of social SDIs.

According to Coleman, et al, the national mapping organizations must be prepared to entertain some important procedural and cultural changes (Coleman, et al, 2009). Land Surveyors, as essential actor of authoritative mapping organizations, should understand their new roles, if they want to take advantage of "produsers".

One of their roles should be aimed to the validation of users´s contributions, introducing *new rules and/or legislation to account for and balance the rights of individual contributors to those of both the "produsage" community and the mapping organization (Coleman et al, 2009).*

Surveyors graduates in recent years have received their university education with new technologies, but a critical mass of them, graduated years ago, have not received this training. The latter require more attention in training on Web 2.0 and 3.0 concepts and tools.

Surveyors are professionals working in the following two major groups: institutional level and independent professionals.
Making a parallel with the terminology used in SDI, those working at the institutional level would be in the group of "providers" and who act as independent professionals in the group of "users".

In some places, like Argentina for example, attempts to SDI development initiatives, focusing on "Data providers" have not allowed the active participation of "users".

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The development of SDI with a focus on the "user", opens up broad possibilities for participation of surveyors as "data providers" and as "users".

Web 3.0 also provides new areas for action and therefore new markets and new tasks for surveyors. For inclusion in these new markets, active participation in social networks will enable the surveyors, an easier interaction with other professions and disciplines.

FINAL REMARKS

Due to the increasing demand for geographic information by the society and the limited capacity of providers to fully meet this demand, it is necessary to incorporate the user in this process. Thus, using the power of the Web and collective intelligence is feasible to increase the provision of thematic data for SDIs. Land Surveyors, like other professions can contribute to this process.

Social SDI's and Web 2.0 and 3.0 offer new opportunities for Land Surveyors.

The inclusion of concepts and tools of Web 2.0 and 3.0 in CPD programs will enable narrowing the digital gap among the professionals that lack these e-competences.

Management of concepts and tools of Web 2.0 and 3.0 open channels for the user's active participation in the SDI. In regard to surveyors, the inclusion of these concepts and tools as part of the contents of CPD programs, will increase their opportunities of participation.

Land surveyors trained in Web 2.0 and 3.0 will have more opportunities to interact and contribute from their profession to the SDI's through social networks.

The development of SDI with a focus on the "user", opens up broad possibilities for participation of surveyors as "data providers" and as "users".

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REFERENCES

Carrera, F & Ferreira, J. (2007). The Future of Spatial Data Infrastructures: Capacity building for the Emergence of Municipal SDIs. International Journal of Spatial Data Infrastructures Research, 2007, Vol. 2, 49-68.

Coleman, D., Georgiadou, Y., Labonte, J. (2009). Volunteered Geographic Information: the nature and motivation of produsers, Proceedings GSDI 11, Holanda, Junio, 2009.

Cobo Romaní, J. (2009). Strategies to Promote the Development of E-competencies in the Next Generation of Professionals, European and International Trends. Monograph No. 13, November 2009, ESRC, Cardiff and Oxford Universities.

Craglia, M., Goodchild, M. ; Annoni, A., Camara G., Gould, M.; Kunhn W., Mark D., Masser I., Maguire D., Liang, St., Parsons, E. (2008). Next-Generation Digital Eart. A position paper from the Vespucci Initiative for the Advancement of Geographic Information Science. International Journal of Spatial Data Infrastructures Research, 2008, Vol. 3, 146-167.

Cruz, R., Capote, J.L., González, G. (2009). Toward IDERC 2.0. Proceedings GSDI 11, Rotterdam, Holanda, Junio, 2009.

Davis, T. & Mintz, M., (2009). Design features for the Social Web: The Arcquitecture of Deme, Proceedings of 8th Int'l Workshop on Web-Oriented Software Technologies (IWWOST 2009), 2009.

De Man, E. (2007). Beyond Spatial Data Infrastructures there are no SDIs – so what. International Journal of Spatial Data Infrastructures Research, 2007, Vol. 2, 1-23.

Groot, R. and J.D. McLaughlin (Editors) (2002). Geospatial Data Infrastructure: Concepts, Cases and Good Practice. Oxford University Press, Oxford, UK.

Enemark, S. (2006). Capacity Building for Institutional Development in Surveying and Land Management, Promoting Land Administration and Good Governance, 5th FIG Regional Conference Accra, Ghana, March 8-11, 2006.

Enemark, S., van der Molen P. (2008). Capacity Assessment in Land Administration. FIG Publication Nº 41, FIG, Denmark 1998.

Delgado, T., Crompvoets, J. (2007). Infraestructuras de Datos Espaciales en Iberoamérica y el Caribe. Habana: IDICT, 2007.

Delgado, T. & Cruz, R. (2009). Spatial Data Infrastructure: From National to local level. Proceedings GSDI 11, Rotterdam, Holanda, Junio, 2009.

Groot, R. and P. van der Molen, Eds. (2001).Workshop on capacity building on land administration for developing countries. Final Report on Workshop held at ITC, Enchede, the Netherlands, 12-15 November, 2000.

Gould, M. (2008). Neogeografía: ¿ventaja o preocupación? [Electronic presentation] Barcelona : VII Forum TIG-SIG, 2008.

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Holmes, C. (2008). Towards an Open Geo Web: Linking Open Source's "Architectures of Participation" to the Global SDI Initiative. [online] 2008.

Hudson-Smith, A., Crooks, A. (2008). The Renaissance of Geographic Information: Neogeography, Gaming and Second Life. [online] August de 2008.

Kenie T., Enemark, S.(1996). Continuing Professional Development , International Federation of Surveyors, http://www.fig.net/pub/figpub/pub15/figpub15.htm, Publication Nº15, FIG, Denmark 1996.

Maguel H., Espinoza, J., Klaus, M., Masum, F.(2009). Capacity Building in Land Management: The Need for Establishing a Global Academic Partnership. 7th FIG Regional Conference Spatial Data Serving People: Land Governance and the Environment – Building the Capacity, Hanoi, Vietnam, October 2009.

Masser, I. (2006). What's special about SDI Related Research?. International Journal of Spatial Data Infrastructures Research, 2006, Vol. 1, 14-23.

McDougall, K.(2009). The potential of citizen volunteered spatial information for building SD, Proceedings GSDI 11, Rotterdam, Holanda, Junio, 2009.

Nebert, D. (2004). Spatial Data Infrastructure Cookbook v2.0. [online] Jan de 2004. http://www.gsdi.org/docs2004/Cookbook/cookbookV2.0.pdf.

O'Reilly T.(2006). Qué es Web 2.0. Patrones del Diseño y Modelos del Negocio para la siguiente generación del software [online]. - 2006. - http://sociedaddelainformacion.telefonica.es/documentos/articulos/ Tribuna web2.pdf.

Rodríguez, A. F., Mas, S., Abad, P. , Alonso, J. A. , Ayuso, J. E., Sánchez, A.,Vilches, L. M. (2008). Una nueva etapa: Hacia la IDE 2.0. [online] 2008.

Sakiko Fukuda-Parr • Lopes, C. • Khalid Malik Edited By (2002). Capacity for Development- New Solutions to Old Problems. United Nations Development Programme. New York.

Santamaría González, F., "Social Networks and Educational Communities. Pedagogical Possibilities" http://sociedadinformacion.fundacion.telefonica.com/telos/articulocuaderno.asp@idarticulo=7&rev=76.htm

Scheunemann, Inguelore. 2007. Ciencia y Sociedad: una vía de doble mano. [online] Septiembre de 2007.

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