

Open Source Resources and Web 2.0 Potentialities for a New Democratic Approach in Programming Practices

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Abstract. This paper reports about an experience concerning the implementation of a WEBGIS, a BLOG and an ontology. WEBGIS and BLOG allow to promote a spread of spatial data knowledge, to consult planning documents in the Internet, increasing transparency level of programming choices and involving different stakeholders participation. The ontology is intended as an in progress powerful tool, increasing knowledge rationality. Ontologies can help the community by defining and explicating a shared language and strengthening the efficacy of direct interactions. The case study has been applied to Marmo Platano–Melandro PIT (Territorial Integrated Projects), an area with high potentialities in the North-Western part of Basilicata Region (Italy), responsible for the accomplishment of POR (Regional Operative Program) Basilicata 2000-2006 and for the elaboration of a common and shared strategy to manage an integrated program of interventions for local development.

Keywords: Democracy, e-democracy, e-participation, open source, WEBGIS, ICT, BLOG, OGC standards, ontologies, programming assessment.

1 Introduction

The debate about electronic democracy has become very interesting during the last ten years. The development of information and communication technologies is finding a dynamic and responsive environment, especially at the local level, where municipal governments are playing a proactive role in achieving new forms of interaction between institutions and citizens. At present the scientific debate aims to investigate the way in which new technologies are changing the relationship between government and citizens. The growing importance of communication aspects in the contemporary planning has been conferring a more and more determining role in planning on electronic world [1]. Using ICT in democratic processes, in fact, makes possible, for public administrations, to involve citizens and all stakeholders in decision-making processes.

Nowadays, despite this situation, great part of programming documents proposes a bottom-up approach, facilitated by new tools [2], considering municipalities as a maximum level of shared decision, ignoring citizen's ideas, opinions and imagination

which might improve their quality. WEBSITE, WEBGIS and BLOG (the first two as information tools and the last one as interaction tools) are the instruments increasing participation level.

The case study has been applied to Marmo Platano–Melandro PIT (Territorial Integrated Project), an area with high potentialities in the North-Western part of Basilicata Region (Italy), including fifteen municipalities and two consortiums of communes in mountain areas. It is a local organization responsible for the implementation of POR (Regional Operative Program) Basilicata 2000-2006 and for the elaboration of a common and shared strategy to manage an integrated program of interventions for local development. The attempt of a new governance, based on cohesion and cooperation among local authorities, is the way to improve efficacy and effectiveness into policies.

This project research has been characterized by several and different objectives, like sharing of territory knowledge, innovating programming procedures, using open source tools, introducing the possibility of assessing, evaluating, measuring efficacy and effectiveness of policies. Moreover, a new way to define a common language and to strengthen the efficacy of direct interactions, through ontologies was introduced, and a participation approach for the next programming period 2007-2013 was set up.

Here we define what do we mean for programming practices in the democratic approach. We intend democracy and e-democracy paradigms according to several aspects: first, it is important to figure out which tools communicate and spread information about strategies, policies, decisions, expected outcomes, etc.. Simply implementing a WEBSITE was not enough to explicate democracy meaning; therefore we achieved it by implementing a WEBGIS, giving spatial dimension to programming interventions and allowing everyone knowledge. Then, every common citizen (and not only) should participate and be involved in programming activities giving feedback to local organizations. The best way we found was establishing a BLOG, as a tool to allow a simple, immediate and effective dialogue between all stakeholders in the territorial context. Democracy means also guaranteeing the coherence among all programming and planning tools. We achieved this purpose by implementing a common language framework referred to programming context, which cannot be misunderstood. Finally, we highlight that making transparent all programming processes is the main character of democracy, especially concerning efficacy and effectiveness evaluation phases.

In this work we describe components and functions of an e-democracy platform developed by the PIT Marmo Platano - Melandro under the scientific direction of the Laboratory of Territorial and Regional Systems Engineering (LISUT) of the University of Basilicata. It is an operative prototype, implemented few months ago, which still has not produced relevant data for the assessment of its efficacy, but it represents an integrated platform with high potentialities for promoting participation in programming development at a local scale.

2 Spread Tools for Programming Practices: WEBGIS Using OGC Standards

The growing diffusion of the Internet allows the transition from “geographic information systems” to “spatial data infrastructures” (SDI), in order to facilitate data dissemination and to reduce data duplication [3]. A Spatial Data Infrastructure means

technologies, policies, standards, and human resources necessary to acquire, process, store, distribute, and improve utilization of geospatial data [4]. In order to implement a Spatial Data Infrastructure, a strong cooperation among local authorities is necessary. Marmo Platano – Melandro PIT played an aggregation role among municipalities in building dialogue and cooperation and encouraging synergy. PIT also played a central role in developing this local spatial data infrastructure, stimulating GIS culture, completely absent in this area. PIT produced main data for the infrastructure and defined information contents and spatial data infrastructure model. After the implementation, a local authority staff has been trained for everyday system update. It may seem that this approach does not properly follow INSPIRE directive [5], [6], [7] but in this phase it is the only way to realize a SDI, because municipalities are too small with scarce resources to develop their own information systems.

WEBGIS is one of the most interesting aspects of PIT information system (<http://www.pitmmp.basilicata.it/PIT/map.phtml>).

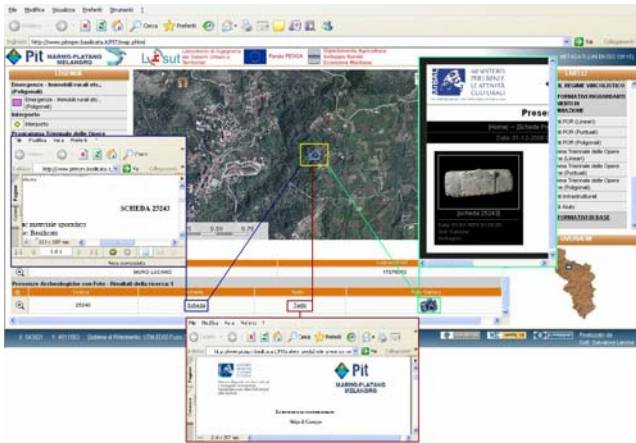


Fig. 1. Marmo Platano – Melandro PIT WEBGIS

This tool pursues many objectives, from the promotion of a spread of spatial data knowledge to the increasing involvement of different stakeholders: it allows citizens, local entrepreneurs, practitioners and employed of local authorities to access geographic databases surfing on the net and to check for spatial funds redistribution in a transparent way.

WEBGIS is based on a *client-server* architecture accessing rules via internet or intranet in order to navigate, update and maintain data. The whole architecture has been developed on an Open Source platform, according to Open GIS Consortium specifications. The operative system adopted is *Debian GNU / Linux*, and the most common applications of GFOSS (Geospatial Free and Open Source Software) have been used; for each informative level, standard ISO 19115 metadata are also made available, following the Metadata National Repertory (CNIPA).

It has been implemented a Web Map Service (WMS), accessible on URL www.pitmmp.basilicata.it/cgi-bin/wms_pit, allowing each user to add PIT data to its own data and to work with his GIS software.

3 The Way to Collect and Take Citizen's Opinions into Account: The PIT 2.0

Over recent years, the Internet has become a popular medium for carrying out all kinds of commercial, social and governmental activities. Presumably it has become a part of society quicker than any other new technology and it is now considered as a new democratizing tool, supposedly bringing people closer together and allowing them to participate in civilized society [8].

During the last decade, all governments and local organizations have been more and more using the Internet and ICT e-government tools in order to give more opportunities for citizen participation and therefore for enhancing information and service delivery to citizens. It is necessary to consider that citizen participation needs constant communication, using new tools in order to facilitate a bottom-up participation process [2]. This approach offers the advantage to stimulate citizen involvement in the choice of design alternatives in programming processes, overcoming time and space constraints. It is possible to separate two main tools: information tools, representing a low participation level and providing a "one-way" participation, and interaction tools, providing a "two-way" participation, including citizen's opinions in process, and considering them as process actors through a mutual exchange of comments, questions, discussion channels, etc. [9].

A typical information tool is the WEBSITE (www.pitmpm.it); although it is a very popular communication tool among governments and institutions, and despite the fact that Marmo Platano – Melandro PIT WEBSITE is very complete in content and information, it represents a low participation level. In order to achieve a high participation level, we activate an interaction tool, the WEBGIS.

An increasing number of local authorities applies the use of Information and Communication Technologies (ICT) to increase the participation of stakeholders in democratic processes, so that the number of e-gov projects and relevant tools is rapidly growing [10]. WEBSITE and WEBGIS are not enough for public participation; in this case information flow goes only from PIT to citizens. It is important to create a sort of virtual space where people can discuss, compare and exchange information, suggesting ideas to public administrations. The support of web 2.0 and ICT technologies aims to capitalize collective intelligence in programming processes. Interesting aspects are related, on one hand, to the creation of a real local organization network, in order to apply transparency, participation to choices, equity, redistribution principles and, on the other hand, to the application of ICT new tools to promote citizen participation in community activities.

Theories about communicative planning have forcefully emphasized how language and modes of communication play a key role in shaping planning practices, public dialogues, policy making, and collaboration processes [11], and today the most popular and effective tools for exchanging opinions and collecting information is the BLOG.

The BLOG (fig. 2) designed for the Marmo Platano - Melandro PIT derives from the need to ensure citizens information and interaction with the institutions on government policies.



Fig. 2. Marmo Platano – Melandro PIT BLOG (<http://blogpit.wordpress.com>)

The BLOG represents a resource for local development, community life and identity; it promotes collaborative relationships and constant citizen involvement in public decisions, overcoming typical participation constraints and giving more emphasis to the role of citizens. At present, we cannot give any interesting results concerning the use of the BLOG because it has been recently made available, but we hope that it might guarantee a real citizenship involvement into the next programming phase (2007-2013 period).

The PIT 2.0 appears ideal for the activation of participatory practices among citizens because they are increasingly familiar to them. Having “familiar” tools will greatly increase potential “participation” [12]. Therefore, e-government produces a transformation from face-oriented or file-oriented services to a digital platform, determining increased effectiveness, improved public information diffusion and enhanced equity opportunities for citizens [13].

More innovative or democratic forms of participation in development planning (voluntarily entered into by local planning authorities) are still relatively rare. But where they do exist, they can provide an effective mean through which planners can fully engage with the communities they serve and generate more informed discourses on planning policy matters [14]. This has happened with the PIT experience: it is rare but possible that in a small context, like the PIT one, new participation forms in development programming can draw up policies and strategies and then “advertise” them to the public to assure transparency and accessibility.

4 Ontologies in Planning and Programming

During the last years, agencies with planning competences have remarkably increased; consequently local authorities are overregulated by a huge number of planning documents. Administrative functions related to territory government are attributed to elective institutions (e.g. municipalities, Regions, etc.). In the same way, sector-based institutions (e.g. monuments and fine arts bureau, national and regional parks, etc.) manage territory by prescriptive plans, more effective than administrative ones.

In a lot of cases a plan by an institution cannot be coherent with a plan by another institution, and some actions admitted by a plan can be forbidden by another. The problem of integration among different plans occurs. A way to tackle this problem is the use of ontologies, basing the integration of geographic information primarily on its meaning [15],[16]. Overcoming the traditional philosophical definition of ontology as the “discipline dealing with theories of being”, we will use the slightly different notion (proposed, among others, by Grüber): a specific ontology *as a model* can be defined as “the explicit specification of an abstract, simplified view of a world we desire to represent” [17].

In order to be useful, the ontology has to be shared. In an international community of users, the first difficulty comes from languages, but a similar problem comes out when we match together different programs or plans adopted by different bodies. Ontology can help the community to define and explicit a common language and to strengthen the efficacy of direct interactions [18].

The development of an ontology might be quite different depending on the level of user’s involvement [19]. In the present case, the ontological approach has been developed by a limited group of experts (managing the research project) and then imposed to the community members through the tools developed (WEBSITE, WEBGIS, BLOG).

Ontology design is a crucial step in the process of applying ontologies to e-democracy tools and processes. Special attention should be paid to the structural elements of the ontology: domain (or ‘scope’ of the ontology), concepts (‘classes’), hierarchy, attributes of concepts, restriction and relations between concepts, instances. The definition of such elements represents the ‘ontology design’.

The domain is the abstraction of the reality we want to represent. In the study case it is composed by physical elements, relations among them, value systems, program actions, social issues, policy goals. The first issue, in order to improve process rationality, is to circumscribe the domain. Ceravolo and Damiani [20] propose some questions to be answered in this phase:

- Q1: Which is the portion of real world we want to describe through the ontology?
- Q2: Which are the answers we expect from our ontology?

In our case we add two other questions concerning the geographic dimension:

- Q3: Which is the spatial dimension of the domain (in other words: “where does the ontology work”)?
- Q4: Is the domain open or close?

Our objective is to represent the whole of plans and programs acting on the PIT area (Q1). These policy tools refer to several institutional levels (from the European level to the municipality one) and they affect several sectors of intervention. Many integrations but also several contradictions are evident.

Answering Q3 question might appear to be a consequence of the administrative border of the study area (the PIT area). This choice is an element of strong simplification of the reality and so it implies errors in gathered evaluations. A way to control such errors is to consider the domain as open in space, time and objects (Q4).

The second methodological question (Q2) is probably the key of the ontology design. What do we expect from our work? In a synthetic view, we implemented

e-democracy tools to improve participation in local development processes. This ontological representation aims to obtain an improvement of rationality in policy making. This could be possible if contradictions and conflicts among different planning tools are removed or at least reduced. The activity (considered as a bottom-up and participated approach) leading to such an ambitious objective is the evaluation intended as comprehensive and context based evaluation [21].

The result of this approach leads us to define five main classes of ontology domain for our application:

1. Plan, defined as “Written account of intended future course of action (scheme), aims at achieving specific goal(s) or objective(s) within a specific timeframe. It explains in a detailed way what, when, how, and by whom needs to be done and often it includes best case, expected case, and worst case scenarios”[22].
2. Project, defined as “Planned set of interrelated tasks to be executed over a fixed period and within certain costs and other limitations”[22].
3. Policy, defined as “A specific statement of principle or of guiding actions that implies clear commitment but is not mandatory. A general direction that a governmental agency sets to follow, in order to meet its goals and objectives before undertaking an action program”[23].
4. Tools, defined as “Financial or normative instruments for policy implementation” (our definition).
5. Actors, defined as “Groups of private, public, no-profit bodies involved in development process” (our definition).

5 Efficacy and Effectiveness into Programming: Assessment Opportunities

The main effort of this work is to provide a widely shared view of programming scenarios in the area of Marmo Platano – Melandro PIT. Such scenarios merge together structural characteristics of the context with the wider framework assisted by European Structural Funds. WEBGIS facilitates the involvement of local government agencies and citizens in the evaluation of the heterogeneous impacts of public expenses.

Within the complex system of functions, relations and procedures for programming and managing EU funds, a strategic need is to definitively link intervention strategies and actions to the local context of implementation [21]. The context becomes the reference term for programming and evaluating public investments. The realized WEBGIS is a tool which gives shots of the territorial condition through a complex data system. It also allows us to go over the static representation, since it provides dynamic perspectives for updating data.

The local development programming during 2000-2006 period followed the traditional procedures with a strong control by Regional Authority in Basilicata region. The involvement of territories (bottom-up approach) has been developed through the experimental tool of Territorial Integrated Projects (PIT). This experimental approach produced heterogeneous results in the different Objective One Regions in Europe and especially in Italy [24]. The Basilicata Region case is considered as a Best Practice for the governance model implemented and in terms of expense capacity of the brand

new territorial bodies (the PITs). An open question is to understand the real perception of the development policy by the final beneficiaries (territories, local communities, productive system, etc.). Considering the study case, citizens of Savoia di Lucania municipality are conscious that about € 17.000,00 of public (mainly EU) funds have been spent for each of them in local development interventions. Tools implemented in this work allow to improve the consciousness of local communities concerning the public effort to support local development, especially giving precise information about “how” and “where” the public intervention took place. The long term impact of such a process is to get an active participation of local communities to decisional processes, in order to obtain more transparent and shared decisions. The final evaluation of the impact of public expenses in the area is far to be achieved, since a lot information is incomplete and the temporal horizon of data collection should be wider. Anyway, this framework allows us to anticipate some future challenges for the territories of the Marmo Platano - Melandro PIT and also to remark some first-level assessment of the informative tool developed. The innovation promoted by Marmo Platano - Melandro PIT started a new governance model alternative to the traditional one [25], as it resulted more effective in the use of public resources.

6 Discussion and Conclusion

The effectiveness of the e-democracy process depends on the participation level considered, both in a qualitative and a quantitative way. It means that a massive participation in terms of number of stakeholders is crucial and at the same time that this participation has to be informed and rational. Stakeholders have to be conscious of the contents of the debate (often technical contents) and they also have to respect a procedure ensuring the rationality of the process itself. A way to ensure the effective use of e-participation tools such as WEBSITE, WEBGIS and BLOG is to build an agreement on semantic interpretation of reality. Such effort depends on the programmer, who should match technical knowledge with “popular” view of reality, in order to facilitate the interaction among stakeholders, administrative bodies and technicians. The ontological approach can give relevant results. Through the application of a well structured ontology to the participative process, it is possible to ensure more transparent evaluation for programming and managing functions, peculiar to the administrative body.

Many opportunities to spread e-democracy come from tools implemented by Marmo Platano – Melandro PIT. This ensured better information and greater opportunities for citizens to be involved in planning process. Benefits of such an effort will come in the future programming period (especially the 2007-2013 EU convergence policy). In our opinion it is important to emphasize the potential of these tools in order to achieve a high level of interaction G2C [26] and the commitment of a local organization, to ensure the improvement of the following principles: participation, interaction and transparency. According to a study accomplished by Lanza and Prospero (2009), the project described in this work is a part of “Collaborative E-Governance”. The implemented project appears like a world of real e-participation focused on virtual and digital tools, belonging to Open Source and Free Web-ware instruments [12]. The application described can lead Public Administrations,

stakeholders, technicians and, in a general view, citizens towards a renewed approach in local development planning. Participation and interaction between components of local communities may produce more true interpretations of the context.

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