Innovative web-based tools for participatory planning

Stefano Magaudda, Giuseppe De Marco, Flavio Camerata

(Stefano Magaudda, Dipartimento di Studi Urbani, Roma, smagaudda@uniroma3.it)
(Giuseppe De Marco, engineer, Rome, giuseppe_demarco@libero.it)
(Flavio Camerata, architect, Rome, f.camerata@gmail.com)

1 ABSTRACT

This paper presents a research carried out by the Department of Urban Studies of the University "Roma Tre" on the participatory process linked to the Strategic Environmental Assessment of the Master Plan of a municipality in the Calabria Region. Web-based tools have been used for publishing on the Web the knowledge base of the municipality (WebGIS), and innovative tools for the active participation of citizens are being tested ("Social" WebGIS"). "Social" WebGIS is an interactive communication and participation tool, which enables the user/citizen to present his own remarks, ideas and suggestions to the planners and the other users, localising them on the territory. It enables all users not only to input multimedia comments with an exact geographical localisation, but also to gain access to all the contents and comments that have been entered into the geographical database by other users. This tool allows for a continuous enhancing of the "soft" knowledge, and is useful for fostering participation of citizens and associations within the planning and assessment process.

2 THE STRATEGIC ENVIRONMENTAL ASSESSMENT AND THE PARTICIPATORY PROCESS

2.1 Origin of the research project

The Department of Urban Studies (DipSU) of the University "Roma Tre" has started in 2008 a research project for carrying out the Strategic Environmental Assessment (SEA Directive 2001/42/EC) of the Master Plan of the Municipality of Montalto Uffugo (Region of Calabria). DipSU has been also in charge of setting up the Territorial Information System for the Municipality, and the WebGIS for publishing the cartographic data on the Web. Within this research, DipSU has tested innovative solutions supporting the participation process of the SEA. The research has arisen from the willingness to acknowledge the potentials of web-based solutions in the involvement of citizens and professionals within participatory planning processes.

2.2 The steps of the SEA procedure and the participatory process

The steps of the SEA procedure are not explicitly listed in the SEA Directive, but can be inferred from studies and experiences that have been widely disseminated, such as the guidelines published as result of the Interreg IIIB "ENPLAN" project, or other official guidelines published by governmental offices, such as the British Office of the Deputy Prime Minister or the Irish Government. They can be grouped into four phases:

- the first one corresponds to the setting of trends of the planning/programming process: screening, identification of territorial, environmental and regulatory context, collection of relevant data and elaboration of the database, identification of key actors and stakeholders to be involved in the participation/consultation process;

- the second phase corresponds to the central part of the planning/programming process, i.e. the drafting of the plan/programme: scoping, consistency analyses, definition of indicators, assessment and selection of scenarios, environmental report;

- the third phase concerns participation and the adoption of the plan/programme: analysis of the outcomes of the participation/consultation activities, SEA statement;

- the fourth phase corresponds to the implementation of the plan/programme and concerns the monitoring of its effects.

It is important to notice how participation is central to SEA and has to be managed since its beginning. It is an iterative process, as its feedbacks have to be continuously taken into account and assessed as part of the decision making, and its methodology and results have to be reported within the SEA statement.

2.3 The regional planning law and SITO

The Region of Calabria, with art. 8 of its Regional Planning Law n.19/2002, has introduced the so-called SITO (Territorial Information System and Observatory of Territorial Development), and imposes that the drafting and the visual representation of the Master Plan (Piano Strutturale Comunale - PSC) are consistent with the Information System of the Region itself. SITO "has to become a system for sharing territorial development knowledge and strategies, extended upon the whole community of actors participating in territorial management: therefore, it has to become a tool shared by different territorial bodies, and an instrument for connecting local, national and Community relevant policies, offering to the society of the Region the conditions for exploiting, with maximum social and economic advantage, the opportunities given by the information society at global level". Therefore, in obedience to the regional law, the starting point of the research project has been the setting up of the knowledge base and the territorial information system for the drafting of the PSC and the carrying out of the SEA.

2.4 The knowledge base and the TIS

The setting up of a structured knowledge base of the territory is an essential step in the drafting of a PSC intended to embody a local development project and to enhance territorial resources without compromising their reproducibility. The realisation of a structured knowledge base has allowed to identify those territorial elements that have not changed in time, being therefore the most valuable, and to formulate the intervention hypotheses after having taken into consideration the environmental and landscape features, and the social, economic and land-use trends, highlighting the needs and foreseeing territorial equipments and performances. The data, information and technical knowledge ("hard" knowledge) are the result of the study, analysis and monitoring of the territory, and have been organised into a Territorial Information System (TIS). The setting up of the TIS has allowed to create a shared knowledge base, which has been a support for the subsequent planning, assessment and participation activities. Together with the equalisation and validation of the existing databases, the TIS has been the result of a close collaboration among the technical staff of the Municipality, the planners of the PSC and the research team. All data have been processed following the technical specifications of the Region of Calabria, and the metadata have been produced according to the ISO-TC211 standard, consistently with the directives of the Cartographic Centre of the Region.

2.5 The WebGIS

Art. 8 of the Regional Planning Law underlines that "the dissemination of information has to take place with rapid, simple and comprehensive methods, such as those provided by the Web, with the aim of allowing institutions interested in territorial management to relate with each other and to launch on the Web information of their own competence, according to a working method based on collaboration and subsidiarity". Within this context, the research team has chosen to publish on the Web the geographic database of the Municipality, implementing a WebGIS system. The WebGIS of the Municipality of Montalto Uffugo has been structured in order to make "hard" knowedge accessible to everybody (professionals and citizens), and to facilitate and make more efficient the study on territory, through a multidisciplinary approach. The WebGIS system that has been realised is based exclusively on Open Source solutions and products, conforming to the specifications of the Open GIS Consortium as regards the publication of information via Web.
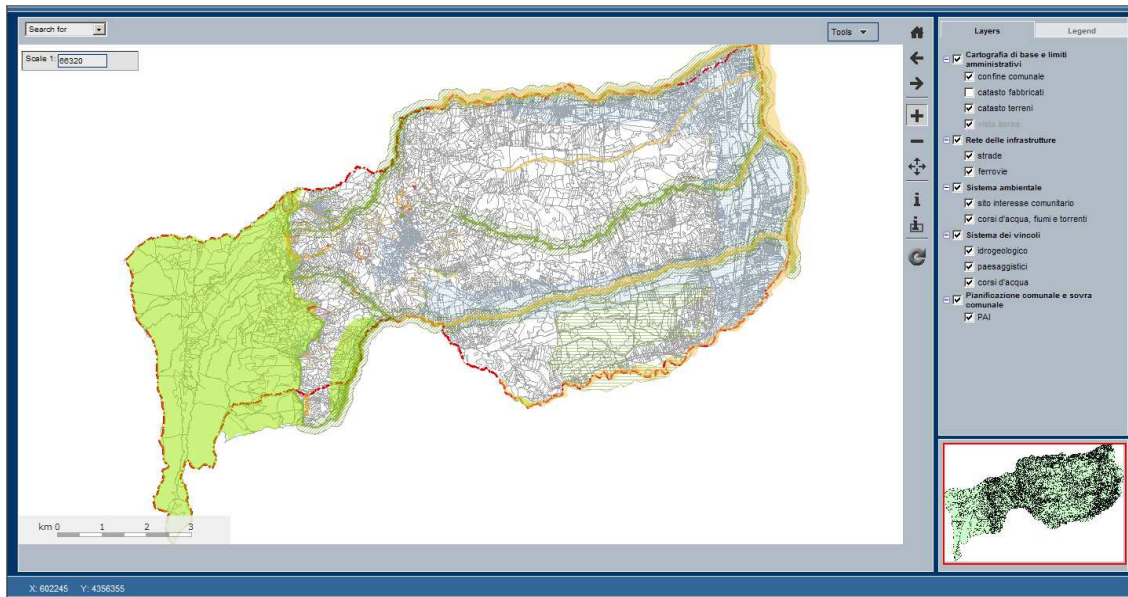
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Fig. 1: The WebGIS

3 INNOVATIVE WEB-BASED TOOLS FOR PARTICIPATORY PLANNING

3.1 The "Social WebGis"

A planning process cannot be based exclusively on technical knowledge, but listening to the citizens' needs and collecting the experiences of those living in the territory is essential. The "informal" or "soft" knowledge is very important for directing the political and planning choices, and for assessing the effects these choices have on the citizens' quality of life. Indeed, within the participation process of the SEA, the classical instruments of direct participation have been used, such as meetings with citizens and associations and focus groups; moreover, the municipal authority has established an Urban Centre, both for disseminating information about the PSC, and for collecting the comments and requests by the citizens. Together with the normal participation activities, the research team is testing the use of innovative tools for web-based participation, which not only allows to gain access to the information and the geographical database of the PSC (WebGIS), but also enables citizens to interact with the public authority and with the planners in the process of defining its objectives and choices ("Social" WebGIS).
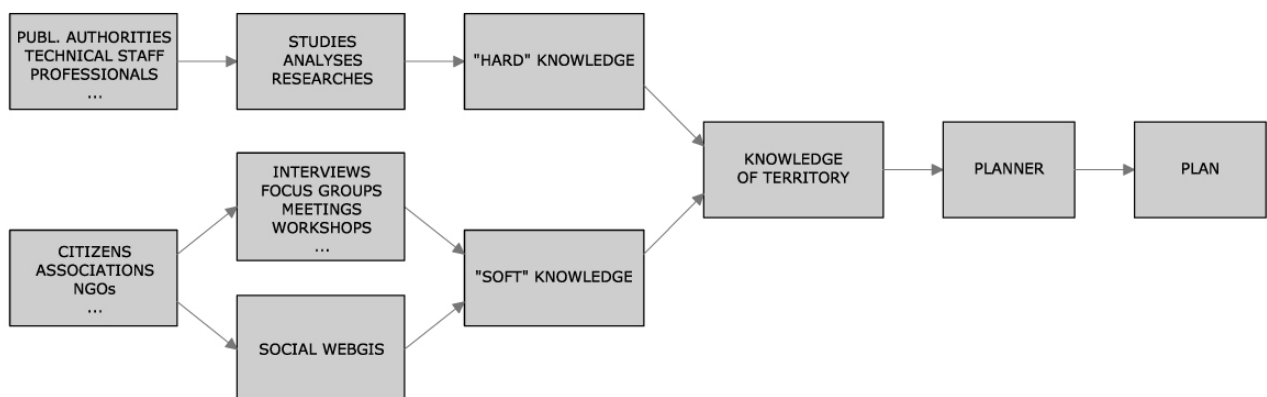

Fig. 2: Building territorial knowledge

Social WebGIS is an interactive communication and participation tool, which enables the user/citizen to present his own remarks, ideas and suggestions to the planners and the other users, localising them on the territory. It enables all users not only to input multimedia comments with an exact geographical localisation, but also to gain access to all the contents and comments that have been entered into the geographical

database by other users. This tool allows for a continuous enhancing of the soft knowledge, and is useful for fostering participation of citizens and associations within the planning and assessment process.

3.2 Technologies and approach

The reference functional architecture of the system is developed on three logical levels: a Front Tier, a Middle Tier, and a Back Tier. The three components are the instrumental supports for the management and exchange of information among the staff of the Municipality and for its dissemination to the citizens. The information (geographical data, documents, texts, multimedia) is directly managed by the technical staff of the Municipality.

The instrumental supports are divided into two main service groups: infrastructure services, aimed at enabling and enhancing cooperation between the Municipality (as service supplier) and the citizens, and information services, addressed to the citizens and to the same Municipality (as service user).
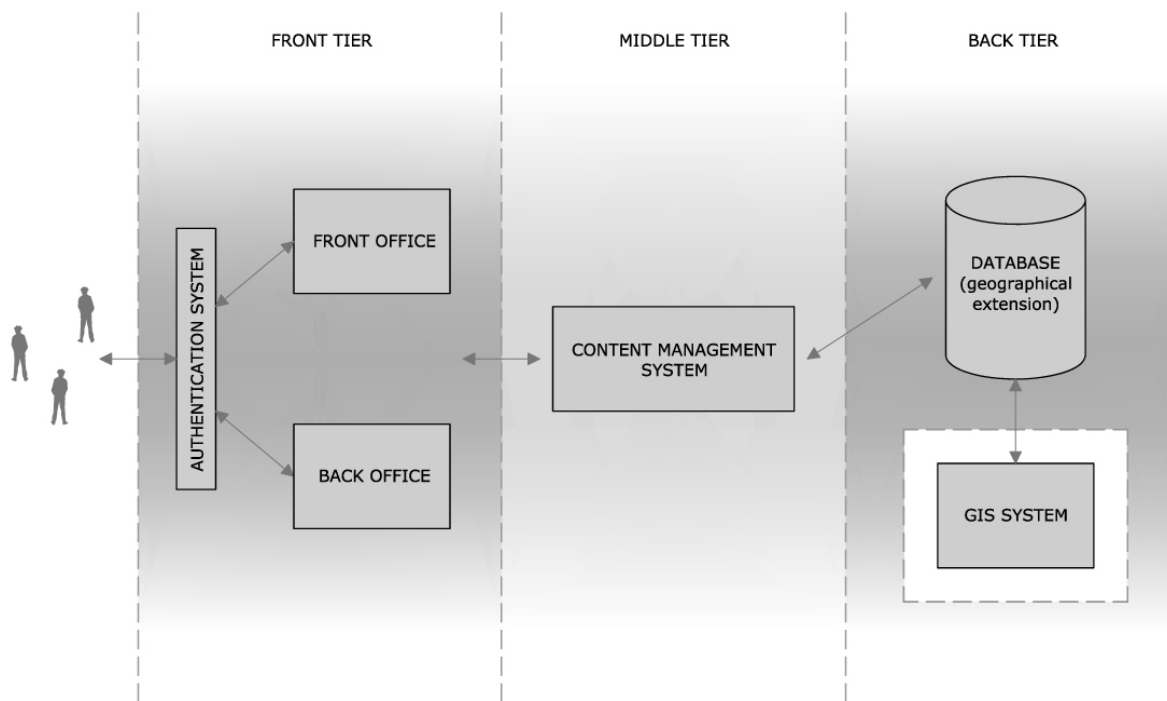
The functional diagram is the following:

Fig. 3: Conceptual schema of the Social WebGIS

The conceptual schema described in figure 3 highlights the logical components of the system:

(1)   the Front Tier is the logical level that supplies services through the implementation of graphical interfaces, created using the most recent web development techniques (Ajax) and compliant with the Web 2.0 Paradigm;

(2)   the Middle Tier is the core of the entire system, entirely realised with Open Source solutions; it deals with data management and provides information;

(3)   the Back Tier is the centralised repository containing all databases of the Municipality (data, metadata, geographical data); the DBMS used is PostgreSQL, with a PostGIS extension for the management of geographical data.

Particular importance is to be given to the GIS system (GRASS and QGIS), which directly interacts with the part of the geodatabase comprising the geographical data.

The system, therefore, proposes a Web interface capable of providing both consultation services, and services for interacting and participating directly (Front Office and Back Office services). Interaction and participation are made possible by an authentication system that supplies services to the user based on a "profile".

Figure 3 shows the layout of the system as regards the Social WebGIS service; its functional components, shared by all other functionalities, are the following:

A – the Authentication System (AS) is an advanced authentication system capable of "recognising" the user, on the basis of his profile (access through login/password), proposing him only those services he is enabled to. The Municipality has the possibility of dividing its users into homogeneous groups, both manually, by choosing the parameters to be taken into consideration, and also automatically, on the basis of the software functionalities. For the definition of the homogeneous user groups, the following have been taken into consideration: the user's typology (citizen, institutional, technical); his explicit declaration obtained through the registration procedures; the identified users' responses to particular contents;

B – the Front Office (FO) services are organised by the institution for supplying web services to the citizens. These services are divided into information services which are freely accessible (consultation, download and upload), and information services with authenticated/authorised access (thematic forums on issues of common interest, GeoBlog working with text and multimedia georeferenced information);

C - the Back Office (BO) services are targeted to the technical staff of the Municipality and provide tools for managing and "regulating" the dissemination of information. These services enable the Municipality to link each single stakeholder to a user group having homogeneous characteristics, to manage the text and multimedia information entered by the citizens, and to manage the metadata relating to all sharable cartographic information. BO activities carried out by the staff of the Municipality are: management of the georeferenced contents entered by the users, moderation of the thematic forums, updating and management of the database through GIS tools.
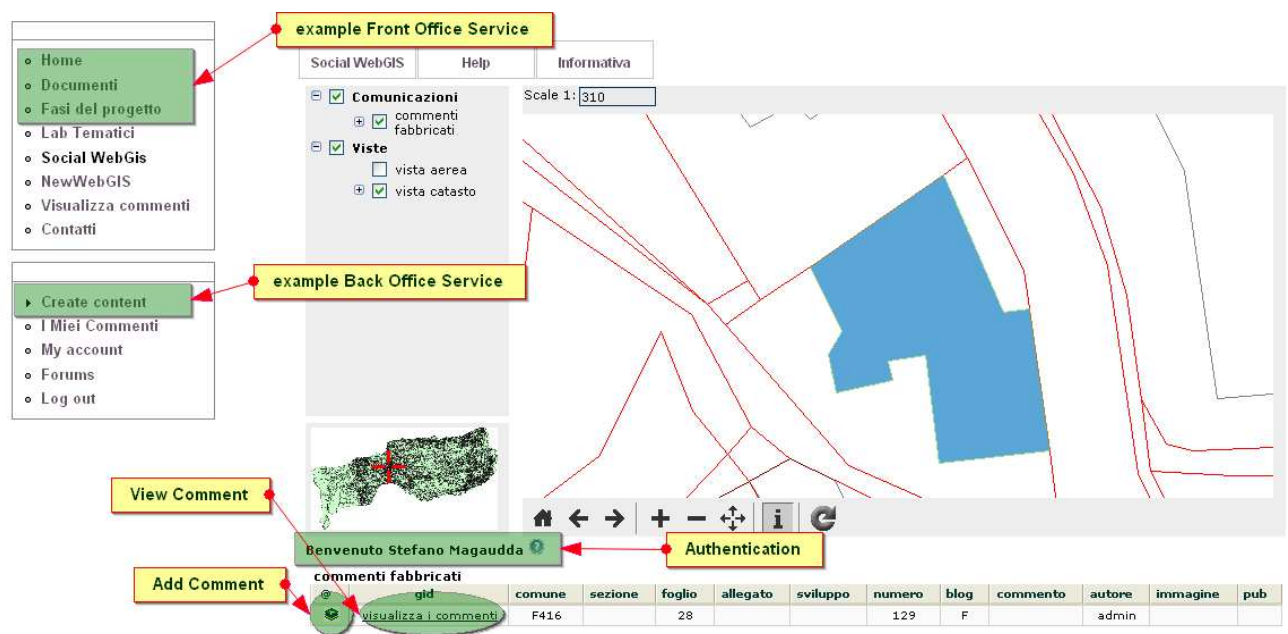

Fig. 4: Graphical interface of the WebGIS.

4 CONCLUSION

The testing of the participation system is at the moment at its initial phase, and the first results and their assessment will be available within the next months. What has been achieved so far is flexible and highly scalable to the different needs of the citizens, the public authority and the planners, who will contribute to integrate and enhance the functionalities of the system. DipSU has realised the entire system using Open Source solutions and products, using the know-how of its internal resources and of experts in infrastructure architecture for enterprise applications.

The first phase of the research has highlighted the potentials of the web based tools for participatory planning. First of all, the Social WebGIS, even if it cannot replace the traditional participation tools, can surely support them, allowing to widen the number of users who actively participate in the planning process. Indeed, many categories of citizens don't have the possibility to participate in the focus groups or

workshops, just because they don't have enough time to dedicate to these activities. Starting from this consideration, the future aim of the research is to involve and motivate the highest number of users in this kind of Web-based participation, singling out their different typologies and refining the functionalities on the basis of the specific needs of each of them.

A second consideration regards the "soft" knowledge within the planning process. Some of the previous experiences of participatory planning, carried out with traditional methods (forums, focus groups, web forums, blogs, etc.) have often produced information that proved not to be very useful to the planners, and the citizens' needs often have not been acknowledged by the plan. For this reason, the Social WebGIS not only is a tool useful to make the citizens express their opinions freely, but it has to be structured so as to guide them in entering opinions especially on questions being relevant to the PSC. The information that the citizens will enter into the system will be controlled, filed and published, in order to allow for a continuous update of the knowledge base and to feed the debate on the most relevant issues of the PSC.

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