Brazilian System of the Cities Information (SNIC): Easing the access to the Information and to the Cities Management

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ABSTRACT: The globalization and the new technologies, that each day are more present in the life of the people, had facilitated the access to the information. The procedure of access the information, are the abilities and the knowledge necessary to identify and to select the best information to answer clinical or research questions, and not simply to access the traditional database in a simplified way. Thus, aiming at the knowledge of the Brazilian cities, the planning actions of the Federal Government, the accompanying of the Ministry actions, the support to the cities and the transparency of the information to the public, the Ministry of the Cities developed the Brazilian System of the Cities Information (SNIC). The SNIC, developed in free software (Java, PHP and PostgreSQL), allows the election, crossing and space visualization of diverse variables in a map, in which high resolution satellite images of the main Brazilian regions are incorporated too.

KEYWORDS: Ministry of Cities; GIS; Access to Information; Satellite Images.

Introduction

The Ministry of the Cities, created by Law 10,683/2003, has as mission "to fight the social inequalities, transforming the cities more human, extending the access of the population to the housing, the sanitation and the transport". To the Ministry competes to treat the urban development politics and the sectorial habitation politics, environment sanitation, urban transportation and traffic. Its creation constituted an innovative factor in the urban politics, in sense where it surpassed the sectorial clipping of the habitation, sanitation, transports (mobility) and traffic in the integration of them, considering the use and occupation of the ground (MCidades, 2003).

Another basic aspect of its creation is the search of the definition focusing one national urban development politics according with other federative components (city and state), the powers of the State Nation (legislative and judiciary) beyond the participation of the society, aiming the coordination and the integration of the investments and actions in the cities of Brazil, directed to the reduction of the social inequality, to the urban planning and the ambient support. In year 2000, according to IBGE (Brazilian Institute of Geography and Statistics), more than 80% of the Brazilian population lived in cities. With the creation of the Ministry of Cities, the Federal Government occupies an institutional emptiness and fulfills a basic function in the urban politics and the sectorial politics of habitation, sanitation and transportation, without opposing, but strengthening, what is defined in the Brazilian Federal Constitution of 1988 that is the decentralization and reinforcement of the cities (Mcidades, 2003).

According to Statute of the Brazilian Cities (Law 10,257/2001), responsible for the regulation of the urban development in the country, the urban planning, the agrarian and housing politics (include zoning, regularization of the ownership or property and workmanships code), requalification of central areas, prevention the risks of collapse of hillsides, recovery of areas environmentally degraded, all of them are cities attributions. The Federal Government, represented by the Ministry of Cities, is responsible for the guidelines of the National Politics of Urban Development, according with the Statute of the Brazilian Cities, but the cities are responsible for the planning and management urban and metropolitan. In the cities can be possible to realize the objectives of citizen participation and the guarantee of the right to the city for all (Mcidades, 2003).

It is also a responsibility of the cities, and it is a obligation for cities with more than twenty thousand inhabitants or that are in tourist or interest area, the Managing Plan of the Cities, which aims to fulfill the constitutional premise of the guarantee of the social function of the city and the urban property. Amongst its diverse stages, the macrozoning is distinguished and it has as objectives:

a) to establish a spatial referential;

b) to define the great occupations areas of the city (Rural and Urban Zone);

c) occupied areas in the city;

d) emptiness territorial;

e) public equipments;

f) environmental / historical / landscaping interest areas;

In this stage, many cities had had difficulties to make it (mainly the minors) due to non-availability of a Geographic Information System (GIS), of politics, morphologic (soil, water, declivity etc), ecosystems (Vegetation, Fauna, Flora), socioeconomics and occupation data. With the purpose to fill this gap of information, beyond the little assistance offered to the cities, the Ministry of Cities developed the Brazilian System of the Cities Information (SNIC), which one will be detailed in the next section.

There are many definitions for Geographic Information System as well as "an organized collection of computer hardware, software geographic data, and personal designed to efficiently capture, store, update manipulate, analyze, and display all forms of geographically referenced information" (Redlands, C.A. (1990)); "a facility for preparing, presenting, and interpreting facts that pertain to the surface of the earth" (Tomlin, C. D. (1990)); and others.

In GIS area, there are a great number of softwares available and sometimes is difficult to discern the differences among them, the strengths and limitations of each one. The main point you have to remember is: there are so many different types of GIS softwares as there are decision-making processes. A Particular GIS software are often specialized to fit certain types of decision making, i. e., they are customized to find specific necessity to demographic forecasting, transportation planning, environmental resource analysis, urban planning, and so on. These systems may work well to individual problems, but they have limitations. Special purpose GIS as well as of that designed for airport planning and maintenance, for instance, will not be able to work for demographic modeling. The SNIC is a GIS not so specialized where the user can easily work with it using only mouse and in any place, these feature is possible because the SNIC is available on Internet.

Brazilian System of the Cities Information (SNIC)

As already mentioned, the Ministry of Cities was created to promote the social inclusion by means of joint and implementation of programs and actions destined to facilitate the access of urban population to worthy habitation, the ambient sanitation and the mobility given for the traffic and public transportation. In its creation, the Ministry of the Cities inherited different systems of information that for having diverse origins, was disarticulated between itself.

Between the legacies systems, several existed just to control financial data of projects managed by the Ministry, some others with information for planning (pointers systems), isolated data bases for specific thematic controls, beyond other information sources. This lack of integration between the systems limited the analyses possibilities, making difficult the definition of a unified urban development politics, in the Ministry performance areas. Beyond the problem of the integration lack among the information systems inherited by the Ministry , the limited target of available information, the insufficient interchange Federal-Municipal and the limited characterization of the cities, had motivated the creation of the BRAZILIAN SYSTEM OF THE CITIES INFORMATION (SNIC). Thus, the general objective of SNIC is to be an integrated information system that beyond allowing better planning and control on Ministry of Cities´s actions, disponibilize information to the municipal administrations and citizens, making possible the local urban planning and the application control of public resource. Is important to say that the implementation of this system is going to the availability of geopositioning data by Internet, which uses free and open technologies, in accord with the orientation of Federal Government, in order to guarantee a bigger interoperability among the information systems, making possible audits to the programs code in order to preserve the data security and privacy and reducing costs with softwares licenses, beyond other functions. Because of that, the system was developed from the TerraLib library, created by INPE (Brazilian Institute for Space Research) using the PHP language with database management system PostgreSQL, and a Brazilian GIS called TerraView, also created by INPE.

The SNIC congregates informations inside of only one database from several sources, such as IBGE, IPEA (Brazilian Institute of Economic Research), National Treasure, BACEN (Central Bank of Brazil), UNDP (United Nations Development Programme), INEP (Brazilian Institute of educational studies), DATASUS (Brazilian database of health), TSE (Brazilian Electoral Court), etc, totalizing more than eight hundred pointers for each Brazilian city. Moreover, high and medium resolution images satellite are in final process of acquisition, of all metropolitans regions and cities within the Growth Acceleration Program (PAC), with workmanships date less than one year. Later, the final idea is to acquired images for the 5,564 Brazilian cities, and update them periodically, so that the municipal managers can follow and plan the transformations of its territory. The system still have integration with Google Maps and with WMS systems (Web Map Service), which allows another way to visualize the domestic territory. Figure 1 presents the initial screen of the system, that you can find available in the Internet address <www2.cidades.gov.br/geosnic>.
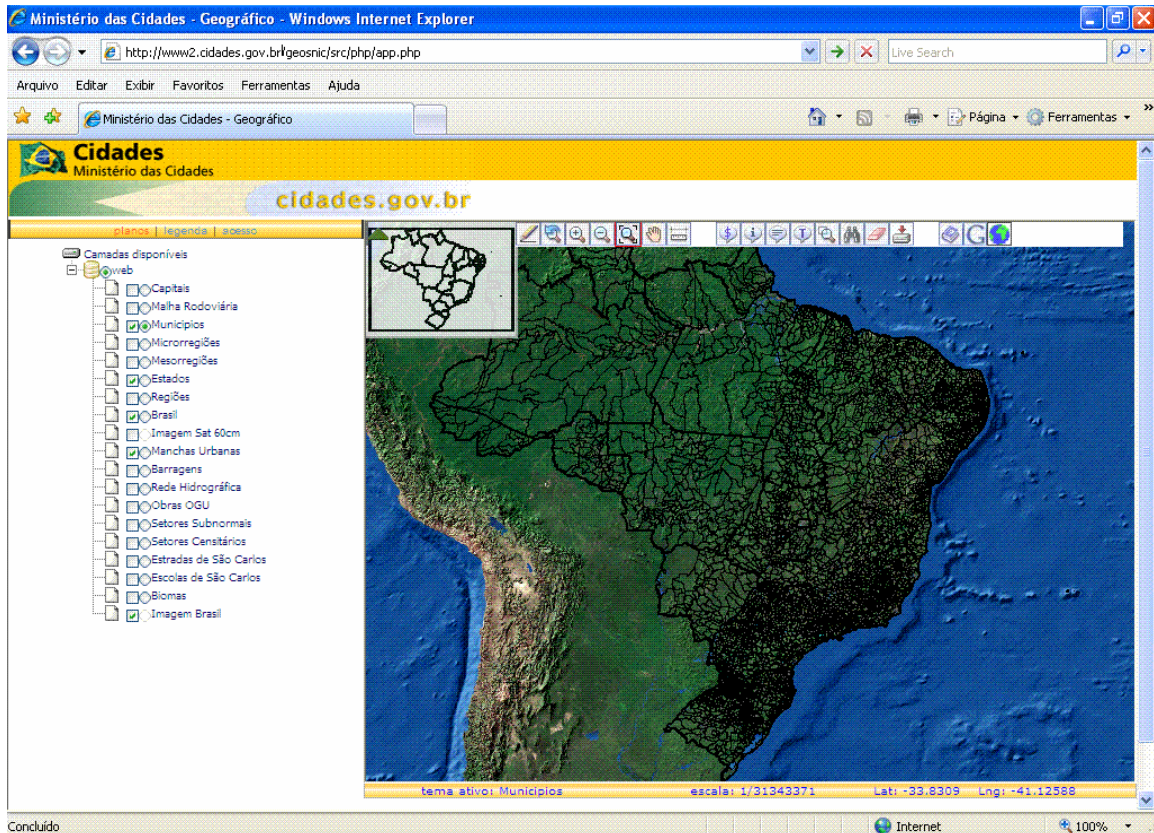
Figure 1: Main Screen of SNIC

The Figure 2 presents the layer of plans of available information. The marking ☑ allows to visualize the layer selected, whereas the marking ◉ indicates which layer is active, that is, the layer that will be used to get information by clicking in the visualization area. The available layers are Federal Capitals, Highways, Cities, Microregions, Mesoregions, States, Regions, Brazil, Satellite Image with 60 cm of Resolution, Environment Image, Urban Spots, Dams, Hydrography, Workmanships with Federal Resource (OGU - Union Master Budget), Tax payer and Subnormal Sectors. It is important to say that these layers are not fixed, and can be updated in accordance with the necessity.

Another aspect that deserves prominence is the Workmanships with Federal Resources OGU. When selected, this layer shows in the map points that indicate the localization of the workmanships. For the great majority of the cities, these points are located in its Headquarters, do to an initial configuration. The idea is to locate (geopositioning) all the workmanships, as already was made in São Luís of Maranhão (Figure 3). Until now, for the reason of validated, the information about contracts is the only functionality that demands password, being all the others with total access. Later such functionality also will be set free, thus allowing the transparency of the Ministry of Cities´s actions.
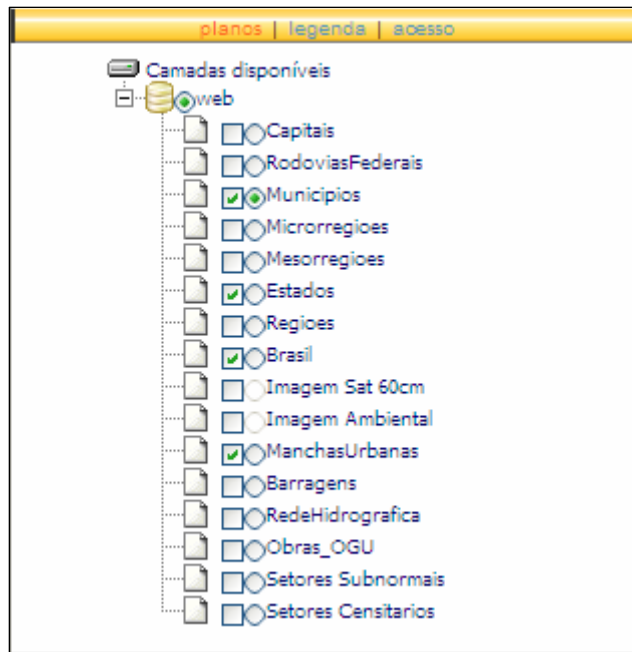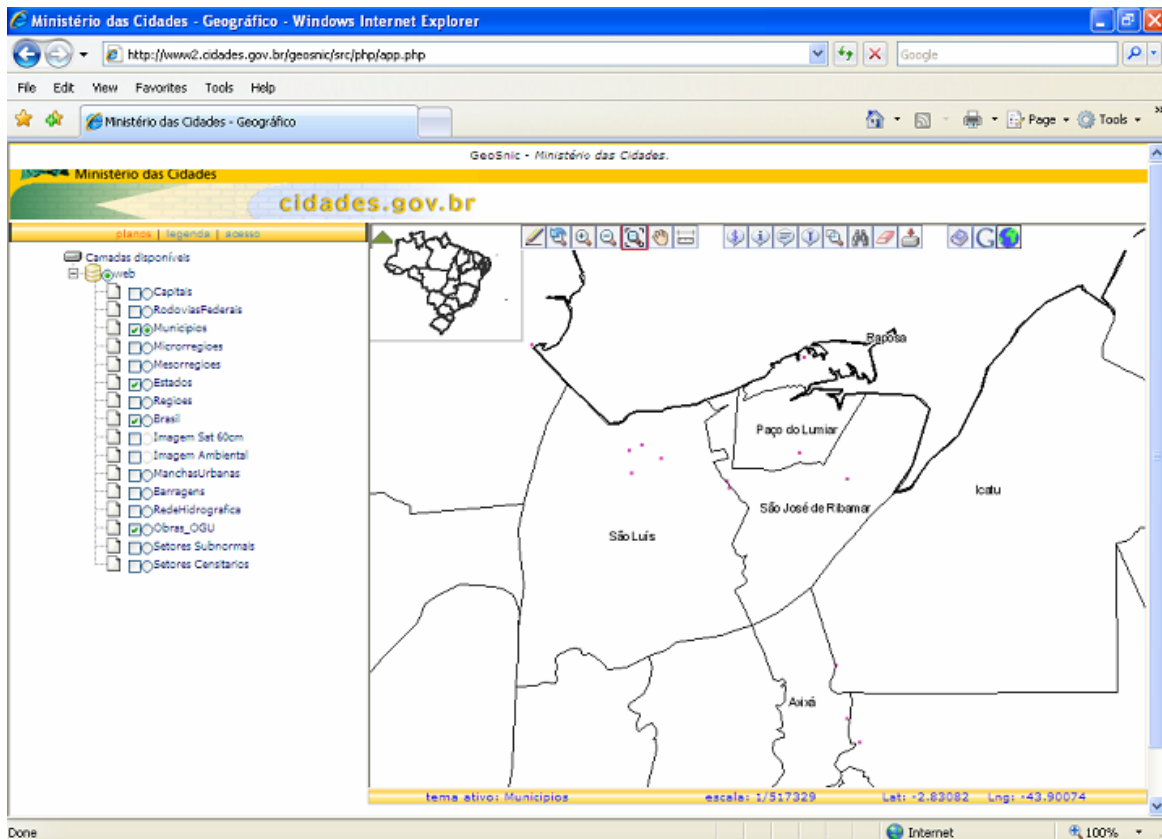
Figure 2: Available Layers.

Figure 3: Workmanships Localities with Federal Resources OGU in city of São Luís/MA.

The Figure 4 shows a high resolution image already incorporated in the SNIC (year 2004), while the Figure 5 shows the image by Google (year 2007). It is interesting to see that had an increase in the number oh houses (inferior part of the images) and this is the idea of the system when it will have all the brought up date images.

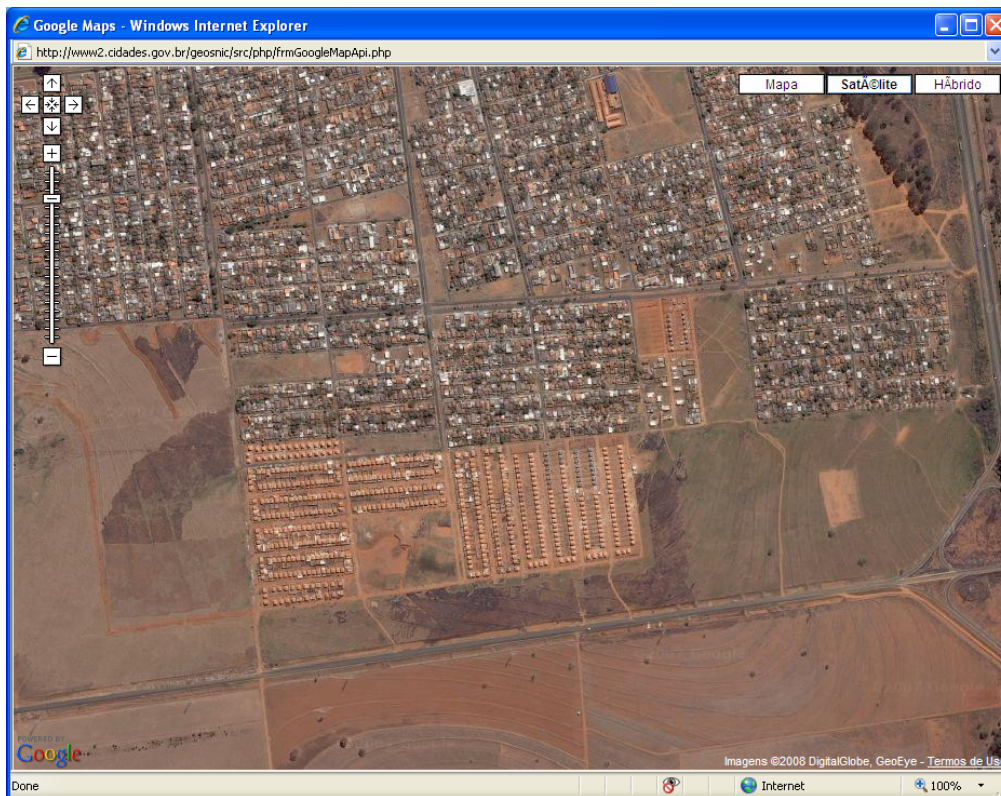Figure 4: High Satellite Image of Uberlândia/MG City.

Figure 5: Google's Image of Uberlândia/MG City.

The tools bar (Figure 6 is composed for 4 groups: visualization tools, query, access the remote database and download data, where the functionalities are in the Table 1.

Figure 6: SNIC´s tools Bar.

Table 1: Tools Bar´s Funcionalities.

Visualization Tools	Query Tools	Access to Remote Database	Download of Data
Design the Map	Contracts of the Cities	Google Maps	Download
Back to Initial Map	Information of Objects	WMS Maps	
Zoom In	Locate Cities		
Zoon Out	Query Assistant		
Zoon In by Area	Help on-line		
Drag Map			
Calculate Distances			
Visualization of Dynamic Label			
Visualization of Static Label			
Clean Selection			

To visualize a selected layer is necessary "Design the Map", clicking in corresponding icon above. The municipal pointers are available in "Query Assistant", option 1 "Simple Query" that shows, prints and/or download a relative report query, that must be chosen amongst a list of predefined simples queries. This query can also be located in the database using a key-word or junction of several key-words with the option 2 "Advanced Query". As in Figure 7, it also can shows, prints and/or download report to one or more space units, all of one belonging the same space level, enclosing a set of pointers optionally submitted the restrictions imposed to the city level. In these options, you have diverse socioeconomics pointers that make possible one better planning, as example: population, amount of establishments etc. Such pointers are also being updated periodically in acquisition of the above-mentioned sources, amongst those that come to be interest.

Actually, the SNIC is not limited to the available module in the Internet. As said previously, many cities had had difficulties to execute the macrozoning present in the managing plan, and as knowed of this difficulty, the Ministry of Cities, with the Ministry of Education - MEC, come promoting the PROEX that is an instrument that encloses projects of university extension, with emphasis in the qualification of public and social agents and in the development of support action to the municipal and state public sector that focus to the institutional development and the implementation of information systems that allow the elaboration of plans and projects of urban development. The only requirement of the course is that the participants are permanent workers of the local administrations, so that the knowledge remains in the region after the training. The GIS

Softwares to be used are the TerraView, for being property of the Brazilian Government and free, and a new version of this one called TerraSIG, which are incorporated functionalities to image register and enhanced, edition of polygons and a layout for print, that are not in the conventional TerraView. All the TerraSIG development was defrayed by the Ministry of Cities and developed by the FUNCATE (Science Foundation, Applications and Space Technologies.), which is an INPE (National institute of Development and Research) subordinated agency.

Figure 7: Some Pointers of the SNIC.

In general, the SNIC is composed in 4 levels: Central level, Governmental Intranet and Intranet, Internet and GIS Remote Module.

Level 1: Central level where you have databases management. Central database that serves the corporative environment of the Ministry of Cities and the web platform for dissemination of information to the general public. In this level are concentrated the base edition tools, the databases entrance and maintenance module.

Level 2a: Intranet - Corporative access to the databases through tools of space analysis spread in the customers platforms of the Ministry of Cities. The centered bases are accessed by the diverse secretariats and tied agencies, with analysis capacity, reports generation and presentation modules.

Level 2b: Governmental Intranet - Shared access to other Ministries and agencies of Federal Administration, allowing ample access to the existing data to the capacity, similar analysis to those considered in the internal level of the Ministry of Cities. The accesses by Internet contain stipulated controls of permission through the cooperation terms.

Level 3: Internet - Data dissemination for the general public through web with basic capacities of visualization and queries to the unified databases. This level serves for publication of databases consolidated in the Ministry of Cities, taking care the rule of transparency of the administration.

Level 4: GIS Remote Module - the remote modules are local rejoinders of the system with customized data set in agreement to the local contexts. This component presents all the three previous levels tools and a specific module for connection with the central base in the Ministry of Cities, being possible remote update for the cities databases.

Conclusions

The BRAZILIAN SYSTEM OF THE CITIES INFORMATION – SNIC constitutes as a powerful tool capable to assist the municipal managers in the management of its territory. The module available in the Internet allows the query and visualization (thematic maps) of diverse pointers, as well as the visualization of territory, either by incorporated satellite images already in the system, as well as Google Maps and WMS System. The locals GIS (TerraView and TerraSIG) allow the municipal managers construct territorial shapes and update pertinent information to its reality, being able, later, to publish them in the Internet module. With this, the expectation is that the SNIC serves as subsidy for taking decisions, as well for students and professional's research.

In this way, the Ministry of Cities longs for to be fulfilling its mission of helping and defining the general lines of direction for the National Politics of Urban Development, making possible to the municipal managers more elements that allow them basement in its projects directed to this Ministry, when the necessity of more public resources appears.

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