INFORMATIVE INSTRUMENTS FOR URBAN TERRITORY KNOWLEDGE AND MONITORING

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Introduction

The increase of the collaboration between national institutions and local authorities in security matter and the acknowledgement of the local authorities central position in prevention policies and, more in general, government of the territory, require Local Authorities themselves to adapt their own "instruments".

On one side, in fact, the collaboration between Commune and Prefecture for security related phenomena of crime and illegality, with a Local Authority competence mostly on prevention aspects, requires that the Commune develops a new project that ranges from city requalification, to a greater presence on the territory, to a new role of Municipal Policemen.

On the other hand, about the Commune competences in Civil Protection, there is the necessity to write out and to update emergency projects on the municipal territory, besides effectively managing the eventual emergencies.

Regarding all this it appears obvious the central position, for the Local Authorities, of knowing their own territory and its dynamics and, consequently, the opportunity to adopt all those instruments, offered by modern technologies, that allow to answer to this requirement.

The following analysis of some among the most recent experiences conduced by Tecnopolis in the field of technologies for the acquaintance and management of the territory, even if developed with different applicative purposes, allows to estimate the importance regarding the topics of the city security and to delineate a possible path for a greater use of these technologies in terms of security.

GIS Technologies

Geographical Information Systems (GIS) technologies, although about 15 years "old" and nowadays strongly evolute, pay a strong delay in the introduction inside the operative realities of our Authorities: in fact, if they turn out to be widely spread in public services companies, for the management and the control of technological networks, that is in the central PA, with middle-small detail scales data banks, they are less diffused in municipal ambits. Nevertheless, an Informative Territorial System (SIT), based on the use of GIS technologies, with its ability to associate alphanumeric characteristic data of a territorial system to a graphical base, allows to represent visually and in map-shape the course of social, economic, natural, cultural phenomena in action on a certain territory and, through this, it offers then greater possibilities of understanding the phenomena themselves, their present and, sometimes, expected dynamics.

In this sense a SIT is a fundamental instrument of support to project formulation, to programme definition, to strategic line choice to pursue, to effect appraisal of a particular choice on the social and territorial system, as well as, obviously, instrument of support to the ordinary management of the territory.

The primary aim in the development of a SIT is linked to the

- construction of an integrated territorial informative base
- construction of modalities of interrogation and use of such information in a simple way also for not specialised operators, creating thematic "views" for quarter, for block, for single building....
- creation of updating modalities of the informative base.

An operative experience in course of realization on part of the Commune of Bari, with the collaboration of Tecnopolis, is the construction of the SIT of the Ancient Village of Bari, in the URBAN project ambit. The SIT, necessary to support the process in course of requalification of the historical centre, has to turn out therefore as an instrument of support to numerous aims and interventions, present and future ones, that go from the recovery to the management, to the valorization of the city patrimony of the area.

The data bank in course of realization collects therefore all the information available and useful for the aims of the project, offering an integrated and systematic vision based on

- physical structure of the building patrimony (real estate units, road network, technological networks) and structures estate
- socio-economic conditions (economic activities, social services,..)
- properties
- inhabitants
- policies practised by Public Administration
- etc.

The SIT of the Ancient Village turns out, therefore, to be an environment for integration of information standing in other archives of the same Administration (Urban planning, Socio-economic activities, Registry office) as well as of information coming from external Authorities (Artistical Superintendence, Cadastre,...). Such process presupposes, however, also the realization of ground surveys for the updating and/or the validation of the information. The use of the system regarding objectives of city security will be linked, for example, to the possibility to visualize, in their space dimension on territory, information coming from ISTAT censuses or from other statistics and social data available on the territory itself: this, together with the possibility to intercross them with other typologies of information, will supply to the competent structures a fundamental cognitive instrument to set up local projects of prevention that can really turn out effective.

Technologies for the exchange among different archives

The value of information included in a SIT is linked

- to level of data updating
- to possibility to intercross/integrate data with further information, relative to the same area, but with different thematic content, even if managed in archives belonging to different Administrations

- to information coherence present in the various archives.

In consideration of the immense cognitive patrimony available near the various central and peripheral Administrations, the aim is therefore to find modalities allowing an effective dialogue among different archives containing complementary information relevant to the same territory. The difficulty is, therefore, to render compatible the different information and to guarantee a continuous updating and alignment of the same information, even maintaining the substantial managerial autonomy of the different systems.

In other words, the problem exceeds that of individual data compatibility, in the perspective to achieve applicative co-operation among the various Administrations.

The topic has been faced in a systematic way, at national level, within the programme of RUPA (Unitary Network of Public Administration), started from AIPA; in particular, the perspective is that to make the applicative co-operation of informative systems possible, as a base to guarantee the co-operation among different organisative systems, respecting some principles such as:

- autonomy of the informative systems existing inside individual Administrations
- certification of the informative flows at application level
- alignment of the information managed by the co-operation instruments
- integrated management of security
- level of services quality
- economy of scale regarding the number of the administrations involved.

These principles are finding, at national level, practical experimentation in some inter-sectoral projects among which the InterExchange Cadastre-Communes Project, that finds its initial justification in the fiscal decentralization process. Regarding this project the Communes are more and more engaged in setting-up control and management systems of the territory and, in particular, of the real estate.

The inner difficulties of the Cadastre-Communes project are in the different addressing system of the real estate on part of the Cadastre (sheet/number/particle) and on part of Communes (the address in the road-book); in the different cartographic projection system adopted; in the frequent incongruity of the road-book and of the toponymy; in the lack of updating/alignment among respective archives; etc.

The solution to these problems, at the basis of a beginning phase of alignment of the data banks, passes through the realization of an Exchange System, based on web technology, that guarantees the continuous updating and alignment of the different informative sources, in a joint relationship that supplies advantages to both "actors" of the exchange.

Tecnopolis promoted one of the three pilot-projects Cadastre-Commune at national level, project based on participation of the Commune of Bari, in association with those of Adelfia, Casamassima, Capurso, Triggiano, Turi and Valenzano and with the technical support of the same Tecnopolis.

Respect to a technological dimension we have to say that the Bari pilot-project represents, at national level, the one that has reached one of the most developed levels in the exchange technological aspects, also through the constitution of the Centre of Management.

In relation to an application dimension, besides the emphasis on local fiscality objectives, we have to observe that crossing of the respective data banks relative to the territory is functional to a multiplicity of uses from part of the Administrations: first of all it can offer an updated and univocal base for the realization of SIT at municipal level; secondly, supplying integrated and aligned information, it can become an instrument of support also regarding local security topics, both in the aspects of the Police Forces interest, and in the innermost aspects of the Civil Protection.

On the other hand, further functional widenings of the project and of parallel projects will be possible within the programming connected to the POR Puglia 2000-2006, where moreover, Tecnopolis develops a role of support to the regional strategies of realization of RUPA.

Satellite remote sensing technologies

The technologies available for the Earth observation from the space have made possible, in the past, the setting up of a variety of applications on scales gradually of greater detail, from scales 1:100.000. 1:50.000 of Landsat TM (multispectral sensors with resolution to ground 30 m) until scales 1:50.000 - 1:25.000 connected to the use of data SPOT (10 m in the panchromatic; 20 m in the multispectral). The application ambits of greater importance have regarded agricolture and forests, territorial planning, the soil defense, etc.

Tecnopolis itself has realised, in the years, a series of demonstrative applications based on the use of remote sensing data: of particular interest, regarding the today's context, a research project financed by Ministry of Environment through which a survey modality has been set up, based on Landsat TM images, of illicit waste disposal sites.

Most recent years have seen a strong evolution of the satellite remote sensing technologies that has made available, for civil scopes, data of Earth observation reserved, so far, to military scopes.

The Ikonos satellite data, currently in orbit, guarantee, for example, panchromatic images of 1m of resolution to the ground, images that are opening new and immense possibilities of applications in city context.

Roma / Il Viminale - Ikonos Image acquired on 9 October 1999 (Source: Space Imaging)

The inevitable comparison with aerophotographic covers enhances advantages for the satellite choice as the possibility of a frequency of review of the area, which can hardly be done with aerial flights; the possibility to acquire images for areas also of quite limited extension; an accessible cost also by of small administrations; a minor bureaucratic system for the data access.

In consideration of the meaningful operative impact that the availability of these new data could determine on Local PA, Tecnopolis has started, partially financed by Italian Space Agency (ASI) a programme for transfer of high resolution space remote sensing technologies towards Local PA.

The project, called IN.P.U.T. (INnovation of the Urban Processes by means of Satellite Remote Sensing), coordinated by Tecnopolis with the participation of a local SME (Planetek), of the technology park Technapoli and of an Aerospace Research Center (Corista), includes

as partner the Municipal Authority of Bari and the Province of Naples with the objective to introduce in a pre-operative way, inside these Administrations, the use of space technologies.

The realization of the project within the Commune of Bari constitutes a natural "functional" extension of the Cadastre-Commune project. The satellite technologies offer, in fact, in this context the possibility of

- "taking an instant picture" of the real estate of a territory to a certain date
- to put in evidence the presence on the territory of not existing pieces of real estate in the archives cadastre-commune and, as such, either not yet introduced in the archives or built in an illicit way.
- to identify in a secure way along the time, through functions of *change detection*, modifications which have taken part on the territory, evidencing, for example, in a relatively timely way, the opening of new yards or other modifications adopted on the territory.

The value of these technologies is then obvious regarding objectives of city security, whereas the same PON Security notices, for example, as strategic interventions the contrast to illegal building and to the illicit waste disposal sites.

Beside this we have then to consider the value of information at high resolution regarding problems of civil protection, linked, for example, to the infrastructures mapping ability.

Conclusions

It is undeniable that the informative bases previously discussed have already an important value for security (think about, for example, the value of a buildings security cadastre regarding local policies of buildings prevention and security).

We can, also, suggest that the discussed technologies can be addressed in a still more precise way towards security objectives: on one hand, in fact, it is considered the possibility to start data-exchange projects (Cadastre-Communes typology), but afferent to security topics, involving the Police Forces' archives as well as of Civil Protection's, together, obviously, with the Local Authorities own archives, where this activity would have to be carried out in a programmatic and financial national ambit (such as, for example, that offered by the PON Security); on the other hand, on a merely local point of view, possible evolutionary approaches could regard a greater focus of territorial informative systems towards security topics as well as the start of procedures allowing an operative use of satellite remote sensing technologies towards a territory dynamics "continuous" control.

We move, therefore, from a problem of availability of adequate technologies towards a problem of will of their use.