

# GIM INTERNATIONAL INTERVIEWS

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### Lost in Italy



The establishment of a National Geo-information Infrastructure in Italy is problematic. This is due to a complex set of factors, the most important of which seem to be rudimentary geomatics education at university level and the absence of a Geodetic Commission as overarching and unifying nationally operating body. To find more specific answers, and the broader lesson, we interviewed Renzo Carlucci, Professor of Geomatics at the University of Roma III.

#### *How are national mapping agencies organised in Italy?*

It is my strong opinion that Italy lost the concept of a National Mapping Agency in the 1970s. Fifty years back there were five National Mapping Agencies in Italy, co-ordinated by a Geodetic Commission. In the 1970s policymakers judged such a commission to be

superfluous and eliminated this overarching and unifying body operating at national level. This, in conjunction with a gradual reduction in university Geomatics education to its present virtually non-existent level, has meant that knowledge of the field among younger managers is no more than a very thin shell, gained at best through professional experience but lacking thorough theoretical backing. The sad result is that the cost of producing geo-data is high, whilst its quality is low. The costs to society in terms of damage, injuries and lawsuits are tremendous.

#### *How is geomatics education organised in Italy?*

Young people can presently study for the profession of 'Geometra' (Surveyor) in the technical stream at secondary-school level. However, a drastic reduction in surveying-related studies is on the drawing board. At BSc level, Geomatics courses are provided as a (small) component of other studies, such as engineering, architecture and geology. Usually these courses are not compulsory, and comprise no more than a hundred hours of direct teaching. The National University Council recognises the existence of a group of surveying and mapping disciplines; scientific disciplines relating to:

- georeferencing, including geodetic engineering and space geodesy
- surveying and monitoring
- processing of observations
- mapping, including digital cartography and GIS
- complex and thematic metric data referenced in space and time, including space, aerial and close range photogrammetry, interpretation of images, sequences and maps
- remote sensing
- navigation.

Teaching of the above disciplines is carried out by a group of around one hundred teachers at various levels, in about fifty departments of the nearly forty universities distributed over the country. However, Geomatics education at MSc level is virtually non-existent, at least where it concerns land mass. The University of Trieste offers an MSc course in 'Cartography and GIS', while for ocean mapping the University of Genova offers an MSc in Marine Geomatics, supported by the Italian Hydrographic Institute, the body responsible for nautical cartography under the Italian Navy and one of the National Mapping Agencies. That is all.

#### *What are the societal consequences of limited education at university level?*

Good governance increasingly requires good geo-information. Building dikes and roads, conducting census, mapping foreclosures or responding to natural hazards such as earthquake and flood - all these activities need a foundation of accurate and detailed geo-information. Today policymakers are becoming increasingly aware that geo-data can be of great help in clarifying and solving the complex issues that may affect land management and governance of society as a whole. Preserving the richness of our complex landscape is tightly linked to the availability of a wide variety of geo-data that can be quickly and easily accessed and combined.

#### *Can you give some examples that underpin this concept?*

Okay, I have a number of striking examples in my pocket. Let me mention two of them. Some years ago the Italian highway company Autostrade s.p.a. had to acquire many parcels along highways in order to construct additional lanes. The geodetic reference system of the cadastral maps showing property parcel boundaries did not correspond with construction maps used by the designers. The resulting mistakes caused thousands of legal conflicts still pending in the courts of Italy.

I have seen myself, while carrying out geodetic projects at airports, how the maps used for radar control of main airports were based on the ED50 reference system, resulting in a shift of the radar tracks with respect to the WGS84 bearings transmitted by aeroplanes while landing. It does not require much imagination to envisage the precarious situations that could result from wrong manoeuvres. The coexistence of various reference systems is an expensive and dangerous source of error. GIS operators, not trained in geodetic principles, collate geo-data sources using standard GIS warping operations developed for course fitting only, resulting in mismatches and wrong decisions the rectification of which may be costly or not possible at all.

*Let's focus in a little more closely now. What are the consequences of the lack of a Geomatics education at MSc level for establishing a National Geo-information Infrastructure (NGII) in Italy?*

The situation is complex, as there is an ongoing transition from the traditional mapping school, which boasts ancient traditions, to a modern school using GIS and digital geo-data. Anyway, the transfer of power from central government to local government in the 1970s tremendously complicated the establishment of an NGII in Italy. Once there was one single national reference system covering the entire territory of Italy; now we have a dozen or so. There is no proper national legislative framework on the ground to co-ordinate the acquisition, representation and use of geo-data. The twenty regions of which Italy consists have great freedom to manage geo-data in the way they think best fits themselves. The consequences of the lack of standardisation surface only in the course of time; they are unpredictable, can cause much damage and are costly.

*What can be done?*

Today the Italian geomatics community is proposing a legislative intervention aimed at re-establishing a central authority similar to the previous 'Geodetic Commission' decommissioned in the 1970s. But lack of transparency is mainly responsible for the kind of incompetence that we are used to seeing in central and local planning bodies. There the planners consider maps only as beautiful backdrops for their drawings. So the general attitude is one of questioning what added value a Geodetic Commission can offer, and even whether surveying and mapmaking is a highly skilled profession at all.

*A lack of students is causing some countries to consider abandoning university Geomatics education. What is your message?*

Many surveyors abroad have a desire to upgrade their knowledge, to learn new techniques and new means of using existing technologies. Because geomatics is not underpinned and founded on a sound academic base in Italy, such an attitude and culture is absent here. But to straightforwardly answer your question, my message is simple: we don't need plenty of geomatics specialist students; we need an ample knowledge base. I often receive requests from firms for Geomatics students and have to reply that I can offer only one or two annually. There are plenty of jobs, so my message to Geomatics students is that the market needs you, environmental protection cannot do without you. Knowledge about local phenomena and processes are vital for proper monitoring and planning. The geomatics specialist is the one who knows how to collect, store and combine such knowledge. His knowledge and experience are invaluable.