

## A SURVEY OF CURRICULA AND PROFESSIONAL SKILLS IN GEOMATICS

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The development of geoinformation technologies over the last decades has led to important evolutions in the use of cartographic data for land administration. Geographic information systems have first been reserved to expert users with scientific skills, but a wider user community has benefited from cheap hardware and software so that GIS is now commonly used for a better knowledge of territories. Virtual globes now make geographic information accessible to all citizens who can even contribute to data base updating. As in many countries, French academic institutions have offered an increasing number of curricula dedicated to these technologies under the name “géomatique”, and the students are referred to as “géomaticiens”.

However, this new professional community does not have a standard profile, so that employers have difficulties in identifying the right skills under this word corresponding to their real needs and means. For example, a General Council wish to share geographic information among its departments and territories in order to provide common geographic data and ensure regional coherence. To do this, it will deploy a GIS department with extensive expertise in computing and internet technologies, database management, data administration, surveying, mapping and project management. On the other side, a rural territory would like its employee to be able to achieve and publish thematic mapping on the internet, whereas private consulting firms need technicians to acquire topographical data regarding for semantic and topological rules. Finally, several questions arise: what is a « géomaticien » ? What knowledge and skills should he acquire to answer both current needs of its employers and future jobs ? What should ask for an employer to answer its current and prospective needs ? As a consequence, one of our goals is to clarify curricula contents and labour market needs to make academic programs fit employers' requirements.

In 2006, the AAG (Association of American Geographers) had published a collective work of the UCGIS (University Consortium for Geographic Information Science) entitled "The Body GIS&T of Knowledge ". A second edition was produced in 2010. Based on this work, "the GIS Professional Body of Knowledge" aims to describe the core competencies required for professional practice of geographic information. Eleven areas of expertise were identified as part of essential knowledge to practice "geomatics". Thus, any experience or training in connection with one of the referenced field of knowledge can become an element of skills certification in geographic information.

In France, the AFIGéo association (<http://www.afigeo.asso.fr/>) was created 25 years ago to promote the use of geoinformation. To answer the question of employability, we used to worked with the National Agency for Employment (ANPE/Pôle Emploi) so that Geographic Information trades were taken into account in the ROME Code (form 1808). In 2009, a Franco-Quebec meeting was held to cross our views on geomatics trade. Besides, a national survey of curricula and diplomas in geomatics is updated yearly to inform both students and employers about the contents of existing diplomas. This survey is done by AFIGéo in partnership with the Georezo network (<http://georezo.net>). It is based on a Wiki interface allowing diploma responsables to update the information by themselves. The information is organized according to different criteria i.e. regional distribution, diploma level and contents.

The regional distribution of curricula can be represented with maps and compared to the distribution of the employment market ; the diploma level criterion can lead to statistical analysis to compare the number of diplomas to the employment potential at the corresponding level. But the content criterion is more difficult to analyse. A skill reference table has been proposed, based on 25 typical skills such as data acquisition, GIS administration, or transverse skills like project management. This skill table is clearly influenced by the way geoinformation is handled by professionals and by the terms used to identify different technical tasks. The comparison of how skills are named and related to professional activities in different countries shows that “géomaticien” has variable meanings so that employers should express their needs in terms of skills (e.g. a GIS manager does not need the same skills as a land surveyor). However, a common basis is required for most curricula, such as geodesy, topography, cartography, semiology etc. More recent techniques such as GIS, GPS or remote sensing are based on these fundamentals, and the way they relate

with them depends on the skill to be developed and on the cultural origin of the students (topography, geography, informatics etc.).

The survey carried out by AFIGéo should lead to guidelines for employment in order to promote geomatics in the employment market and to improve the adequacy between academic curricula and professional skills.