[KE-01-031] Professional Certification

Abstract

Professional Certification has been a part of the GIS enterprise for over two decades. There are several different certification programs and related activities now in operation within GIS, though there has been much debate over its merits, how it should be done and by whom.

Keywords: accreditation, certification, licensure, professional development

Author & citation

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Explanation

1. **Definitions**

professional certification: status granted to an individual by a certification board, often under the aegis of a professional association, when that individual is judged to meet a specified set of skills and knowledge criteria

accreditation: status granted to educational institutions or organizations and is intended to ensure that the education provided meets approved and advertised content, performance and integrity standards

qualification: the acquisition by individuals of degrees from accredited universities

licensure: a mechanism by which an individual's qualifications are recognized; licensure is regulated by legislation that establishes a set of restricted activities that can only be performed by licensed individuals

2. **Documenting Competence**

Professional Certification has been a part of the GIS enterprise for over two decades. There has been much debate over its merits, how it should be done and by whom. Much of this debate has arisen due to semantic misunderstanding. It is important, therefore, to consider distinctions among categories of how competence in a field is determined.

Certification is granted to an individual by a certification board, often under the aegis of a professional association, when that individual is judged to meet a specified set of skills and knowledge criteria. Certification is intended to demonstrate that an individual is competent in a certain area.

Often confused with certification, accreditation is granted to educational institutions or organizations and is intended to ensure that the education provided meets approved and advertised content, performance and integrity standards. Accreditation allows universities in general or specific university departments or programs to grant degrees or certificates. Certification is for the individual, accreditation is for the education provider.

Qualification is another term that is related to professional certification, though its use is less frequent in the US than in Europe. Qualification in Europe is simply the acquisition of degrees from accredited universities. Thus, given the large number of GIS-related degree programs in the US and worldwide, there are now many qualified university graduates with specific degrees in GIS, such as B.S.GIS and M.S. GIST. These are not professional certification per se, but in many cases they allow holders to meet at least some of the criteria for certification.

An example of the degrees leading to certification, though not directly in the GIS domain, is the awarding of professional certification to planners. The American Institute of Certified Planners (AICP) is the American Planning Association's (APA) institute for certifying professional planners. One of the requirements to achieve certification is to complete a degree from a program that has been accredited by the Planning Accreditation Board (PAB), an independent body recognized by the Council for Higher Education Accreditation (CHEA). No such specialized accreditation board exists for GIS degree programs though universities and colleges are normally accredited under a division of the CHEA.

There is also confusion between the process of professional certification and the awarding of certificates following successful completion of a formal university or training center course of study. Such training certificates are generally unregulated by higher authorities so the quality of such certificates simply reflects the quality of the educational organization providing them. One exception to this is the accreditation awarded by the US Geospatial Intelligence Foundation (USGIF) to universities following submission of a portfolio and approval by the USGIF Board. This accreditation is the only process that allows universities to award to students the USGIF Certificate in Geospatial Intelligence.

Licensure is also a mechanism by which an individual's qualifications are recognized. Licensure is regulated by legislation that establishes a set of restricted activities that can only be performed by licensed individuals. Licensure is intended to provide legal protection in the areas of health, safety, and welfare as a result of the actions of licensed individuals. By this definition, geographers are qualified and surveyors, teachers, lawyers, engineers, electricians, bartenders and massage therapists are licensed. There has been considerable discussion about whether GIS professionals should be licensed, or indeed whether some individuals are already licensed GIS professionals through their licensure as surveyors (Harvey, 2003).

Table 1 summarizes these different kinds of qualifications and gives examples and the organizations that provide some of them.

Table 1. Types and Examples of GIS-related Professional Organizations

	Award/Result	Organization	Website
Professional Certification	Designation as GIS Professional (GISP)	GIS Certification Institute	gisci.org
	Designation as Mapping Scientist, GIS/LIS (CMS)	American Society for Photogrammetry and Remote Sensing	asprs.org
	Designation as Certified Planner (AICP)	American Institute of Certified Planners	aicp.org
Certificate	Certificate in GIS/GIScience/etc.	Many universities and colleges	
	Certificate of completion of training course	Esri	esri.com
Qualification	Degree (e.g. MS GIS)	Universities	
Accreditation	Ability to award the USGIF Certificate in Geospatial Intelligence	US Geospatial Intelligence Foundation	usgif.org
Licensure	Professional Surveyor (PS)	Various State Boards of Licensure for Professional Engineers and Professional Surveyors	ncees.org

3. **Why Have Professional Certification?**

Professional certification is important for a number of reasons (Kemp 2003). It helps employers understand and advertise the appropriate qualifications for new staff members. In some states and local governments, having GIS certification is now a precondition for hiring. By promoting awareness of the qualifications of these professionals, employers are encouraged to set salaries at appropriate levels. It helps professionals, or those striving to be one, to know what knowledge and skills are needed in the field while at the same time demonstrating the broad spectrum of knowledge that is needed so that one narrowly trained sector cannot claim the field to itself. It helps professionals trained in one state or country demonstrate transferable qualifications in other countries.

At the same time, there are a number of reasons that have been put forward in the community for not promoting certification, though these voices are diminishing as the number of certified professionals increases. Early on, there were concerns that the community did not know enough about the necessary skills and knowledge, but that appears to have been resolved by the emergence of certification exams as discussed below. Some academics worried that defining the profession would put constraints on the range of topics that would be included in GIS-related degree programs. It would appear that the diversity of such programs on the market today belie that concern. Finally, a worry that qualified people who do not meet the specific requirements would be excluded also appears to have diminished, likely due to grandfather clauses in the early years of the certification programs that allowed well-experienced professionals to acquire certification without matching all the requirements.

4. **History of Professional Certification in GIS**

In the late 1990’s and early 2000’s there was considerable discussion within the GIS

community regarding the merits of professional certification. in 1993, Obermeyer examined Pugh's (1989) preconditions for professionalism (including representative organizations, a shared language, a professional culture and lore, and a code of ethics) in the context of GIS. This helped bring the community to focus on the idea of professionalism in GIS.

Professional certification in GIS began with little fanfare in 1991 when the American Society for Photogrammetry and Remote Sensing (ASPRS) added the Mapping Scientist, GIS/LIS certification to their series of exam and experience based Certified Mapping Scientist (CMS) certifications. In 2013, this certification was accredited by the Council of Engineering and Scientific Specialty Boards (CESB). Given the origins of this certification in the photogrammetry and remote sensing engineering community, the exam for the GIS/LIS designation continues to have as much as 50% devoted to aspects of engineering/surveying, physics, imaging and photogrammetry. Likely due to this restriction, the uptake has been slow. The list of CMS GIS/LIS professionals shown on the ASPRS website in early 2016 contains less than 100 names.

To address the needs of professionals who come from the geography and planning sides of the academic domain, a committee established by the Urban and Regional Information Systems Association (URISA) in 1997 provided a vehicle for many years of community-wide deliberation and debate on the merits and methods of certification (Kemp and Wiggins 2003). Eventually, the GIS Certification Institute (GISCI) was founded in 2004. As of early 2016, almost 10,000 GISPs have been awarded.

Recently, another professional certification pathway has emerged. In 2011, the US Undersecretary of Defense for Intelligence called for accredited professionalization to be established within the Intelligence Community (IC). This led the US Geospatial Intelligence Foundation (USGIF) to undertake the development of an Essential Body of Knowledge (EBK) for Geospatial Intelligence (GEOINT) upon which a formally accredited professional certification exam can be based. USGIF contends that the EBK, developed by engaging subject matter experts across the GIS-community, is broadly defined and applies to professionals across the geospatial domain, not just those working in the IC. As of early 2016, the EBK has been presented to the community and a few sample examinations have been held.

Wikle (2015) provides an excellent review of the status and outcomes of GIS Professional programs worldwide.

5. **The Professional Certification Process**

All professional certification processes include the requirement to document education and experience in the field. Education requirements range from some coursework in GIS and related fields to degrees from accredited programs. Experience is determined by the number of years working in the field. Some of the programs include early-career opportunities in which new graduates can apply and receive preliminary designation while they work towards full designation after gaining sufficient years of experience.

All certification programs now include an exam, though the GISCI program began using exams only in 2015. Prior to that, a portfolio-based approach was used in which applicants documented evidence to add up the required number of points in each of the required

domains: education, experience, and contributions to the profession. The portfolio-based approach was used initially because, in the early 2000's when the GISP certification was being developed, the committee argued that since GIS professionals worked in a very broad range of fields and required a variety of different knowledge and skill sets, it would be impossible to design one exam that appropriately tested the required qualities. In the intervening 15 years, general awareness of the basic foundations of the field has emerged, so in 2015 the GISCI Board initiated the GISCI Geospatial Core Technical Knowledge Exam® which covers six of the knowledge areas from the UCGIS Body of Knowledge [link to this].

The GISCI certification process retains the requirement to demonstrate contributions to the profession, a key component of the original portfolio-based approach. Such contributions include publications, professional association involvement, awards received, conference presentations, and volunteer efforts such as mentoring. The reason for inclusion of this component in the certification program is a strong sense within the GISCI Board that active professionals must continue to participate in their community in order to stay current and informed.

Finally, all professional certification programs also include a requirement that applicants must commit to adhering to a professional code of ethics. These documents provide an excellent outline of issues, themes and forms of conduct that should concern professionals throughout their working lives. Such ethics codes are intended to enhance the public's trust in the domain's professionals and to help professionals make appropriate choices and evaluate their own work from an ethical point of view.