

# Need for integrating surveying and GIS

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FIG President



Reading Jack Dangermond's views in Coordinates on "Tension between surveying and GIS: A growing

challenge" I have to say that I fully agree. We should build this bridge or, in fact, we should aim at integrating these two areas.

To some extent this integration is already the case at least in many European countries. The GIS profession in Central Europe is very much populated by surveyors working in close cooperation with geographers, architects, planners, and IT people. Visualisation creates understanding and analysing and modelling creates

know knowledge. GIS this way bridge a whole range of professionals.

From FIG point of view, GIS or Spatial Information Management, is a core discipline in Surveying. Surveying and mapping are clearly technical disciplines (within natural and technical science) while cadastre, land management and spatial planning are judicial and managerial disciplines (within social science). The identity of the surveying profession and its educational base therefore should be in the management of spatial data, with links to both the technical and social science approach. The global surveying profession is truly interdisciplinary in terms of having this broad skill base. However, in some countries and regions, such as USA, the profile is more focused on land surveying and boundary determination while GIS is mainly an area for the architects.

The challenge of the future will be to implement the new IT-paradigm and introduce this new multidisciplinary approach into the traditional educational

programmes in surveying and engineering. A future educational profile in surveying should come from the areas of Measurement Science and Land Management, and supported by, and embedded in a broad multidisciplinary paradigm of Spatial Information Management. FIG is strongly promoting this profile while of course recognising the diversity of the surveying profession in various countries and regions.

FIG is looking forward to work closely with ESRI and other partners in pursuing these aims.

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## No such tension

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In my experience, there is no tension between surveying and GIS. Surveyors need GIS and GIS need surveyors. I truly believe that it is only in the mindset of certain people that there is a tension between surveying and GIS.

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## Interdisciplinary knowledge is key

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Surveying to my primary impression can be conventionally defined as determination or collection of point positions and their temporal changes within a predefined reference frame. Before the advent of GIS, commission of surveying within its initial category can meet people's needs to a great extent since no extra analytical or management functions are supposed to be derived from it.

With the development of surveying approaches and increasing needs of GIS service, dynamic and complex information are expected from not only surveying, but also from other fields. At the same time, surveying itself shows the necessity of stepping forward from pure location calculation to active thinking. Surveying results are no longer expressed in form of data sets, but in carefully designed database so as to bridge required analysis and management roles, which can form an essential link for GIS to be developed based on surveyed information. Although this simple fact can help us to briefly understand the relation between surveying and GIS, the emerged gaps among varied GIS components and surveying are complex and it is hard to determine who should do what in the hybrid unit.

To further speak for this confusion, the daily developing LBS may be a good example

for us to see the great challenges in which surveying, mobile computation, mobile GIS and mobile communication are involved. Perhaps the newly derived term "Geoinformatics" can give part of the answer. If so, we do hope it can develop into a practical branch to relate the tension of surveying and GIS in the near future rather than remain a nonfigurative concept that needs concrete definition.

In my view, the synergism to integrate survey and GIS should be activated by both surveyors and GIS professionals. On one hand, there are multiple ways to assimilate location data from surveying, its potential application is now extending to current data mining and as far as knowledge may discover; on other hand, it is not easy for surveyors to synthesize their data sets or database into a versatile GIS as they often need to collect specified data within appointed regions. Interdisciplinary knowledge of both and cooperation between the two form the key to dispute.