Do GIS Professionals Understand their Own Industry Well Enough?

As the power of locational data starts to dawn on a wider range of industries, the GIS profession needs to ensure that it understands the fast-changing world within which it operates. This very challenge, of redefining itself for the 21st century, is explored in the following article by New Zealander, Nathan Heazlewood. Thought-provoking, to say the least.

Many people employed in the GIS Industry are interested in what is happening to our field; for example, trends in changing technology, usage patterns, profitability, and employment prospects. However, getting an accurate picture is problematic in such a multi-faceted industry. Setting criteria and measurement processes is difficult because of constant change and new 'disruptive' elements. There are many online opinions on this topic, but often these cannot be trusted because they are tainted by marketing spin and a lack of solid evidence.

In my view, it is important that the industry improves analysis of how it is growing and changing. This is important for the next generations of graduates (or professionals planning their careers). Training should be targeted so that the workforce fits the employment market.

Although I have read many articles which suggest that "artificial intelligence will soon replace most GIS analyst jobs", I'm not convinced this is will happen soon. While many of these perspectives are somewhat 'clickbait'-focused, it is nevertheless important to understand, based on evidence and metrics, what is happening to the GIS industry and to the employment opportunities within it.

To this end, I have conducted research which has yielded some interesting results, such as the fact that 68% of GIS jobs are within 'Enterprise' GIS roles. Whether or not the training sector is doing enough to develop skills for those jobs is a question which will need to be asked.

What exactly is the GIS Industry?

It was the American game show contestant and author, Ken Jennings, who perhaps best summed up the difficulty in defining our industry. He once reasoned that the decline in geography in academia is due to the demand for increased specialisation, something which the generalist subject of geography is certainly not: "Imagine the poor geographer trying to explain to someone at a campus cocktail party (or even to an unsympathetic administrator) exactly what it is they study..." Jenning's humorous anecdotal conversation consists of the geographer's futile attempt to answer the other guest's questions about his profession. His explanation weaves between the diverse physical geography fields of geology, oceanography, climatology, and meteorology, as well as the human geography fields of sociology, economics, cultural studies, and political science. By the end of the conversation, the baffled dinner guest simply asks "So, uh, what is it that you study then?"

Further to this, distinctions between employment sectors are pedantic. Some people set boundaries between the GIS industry and geomatics or photogrammetry or web-development. Other people want to say that there is no such thing as the GIS Industry, and say that what we do is simply disparate parts of other larger industries. In my view, the GIS industry should be defined as any area of technology that utilises measurements of geography.

Some roles are strongly associated with GIS, such as spatial analysts, cartographers, and photogrammetrists, and some people use these roles to set boundaries. However, there are other roles which are not as strongly associated with GIS technology, but use it very often. This leads to the question 'are geologists, market analysts or environmental scientists part of the industry or not?' In my view, all of these jobs are part of the GIS industry as long as they are using GIS.

To aid understanding of the employment market, a good method is to group together jobs that share similarities. In this regard, the GIS industry can be segmented into four distinguishable 'tribes'. These include: 'Measurers' (the people that collect and do the 'upstream' processing of data); 'Gists' (the branches of science that use the 'downstream' geospatial data to apply to many scientific and business disciples; biologists, geologists, archeologists etc.); 'Graphers' (professionals who focus on the visual presentation of 'downstream' geographic data; such as cartographers, hydrographers etc.); and the 'Techies' (the professionals who specialise in coding, integrating and/or networking).

Using techniques like these makes it easier to analyse what is really happening in the industry; for example, the 'measurer' tribe has been heavily impacted by changes in technology such as photogrammetry. In contrast, it is worth comparing this to what is happening to the Techie side of GIS, which has started to embrace powerful tools and systems such as cloud computing and mobile technology.

Classifying GIS Job Adverts?

The main point of this article is that the GIS community needs to have scientific measurements of what is happening to its industry, rather than relying on biased or narrowly focussed opinions. Although there are basic scientific tools which attempt to do this, such as URISA's salary surveys or Gartner's Hype Cycle, both have their limitations.

Last year I conducted a survey which analysed GIS job advertisements in New Zealand. Some interesting results emerged when I distinguished the jobs according to different classes.

The first class is the 'Solo map person' which accounted for 17% of advertised roles. This refers to roles where there is only one GIS person within an organisation. Typically this person uses desktop GIS to produce maps or reports. Worryingly, it is worth noting that in this field there is no integration with other systems.

Another class is the GIS Process Chain, which accounts for some 8% of all advertisements. In this class, multiple specialists work in a 'production line' environment, such as where a LiDAR specialist captures some data, which is then passed onto a data editor, who converts it to vector data, which is finally used by a cartographer, who produces a finished product. In this 'production line environment', each of these specialists very often uses different desktop software to carry out their duties, and very often files are imported and exported into different formats.

Based on my survey findings, 68% of jobs are in Enterprise GIS roles. This grouping utilise 'Enterprise' implementations of GIS software. Characteristics of this group include the use of industrial strength databases to share data, and feature integrations with other IT systems. Organisations in this category include utilities and telecommunications companies and local/city government organisations.

The third class identified was Disruptive GIS roles, which account for a mere 7% of all advertisements. This is a new and exciting branch of the industry, whereby the GIS data is applied in ways that haven't previously been thought of before. This group, which includes the likes of UBER and Airbnb, is generally coming up with new uses for GIS via the internet, often targeting consumers.

Conclusion

The vast majority of jobs are in the Enterprise grouping, which means that many job-seekers should develop skills for those types of jobs. For this reason, database skills or general IT literacy and skills will be extremely valuable. After all, many GIS professionals don't understand that when IT Techies talk about 'pen-testing' they don't mean checking the ink in the plotter!

While there is a lot of hype and published articles about Disruptive GIS, it appears as if there are not actually that many jobs advertised in these areas, or at least not yet. It would, therefore, be interesting to repeat this analysis over coming years, so that GIS professionals can have a better understanding of how the industry is evolving.

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