

The geomatics profession: looking forward to the next decade



As the years progress towards 2030, many challenges and opportunities may emerge for the profession across a wide spectrum of activities. The democratization of geospatial data and the rapid advancement of technologies to capture this data require a skilled labour force. Where will the



surveyors, geospatial scientists and spatial data specialists come from?

The UN's growing awareness of the importance of our oceans and seas will hopefully develop further into real sustainable actions and outcomes which should require further reliable and cost-effective data acquisition and data management solutions. I believe the general levels of underinvestment in the offshore and hydrographic sector will be rectified in order to progress our knowledge of this least well-known frontier. Pressure is being brought to bear on countries and organizations to develop and implement serious and sustainable management plans for the seas and oceans. Our knowledge of these environments is increasing, but so too is the need to understand how the

seas and oceans can sustain us. Some regimes are more reticent about sharing data and information as it is seen as an advantage and therefore of strategic value. Intellectual rights, inventions and data analytics will be put under pressure as new ideas and applications develop. So too will the release and access to spatial data itself which can often be withheld under the threat of some form of a security risk. Of course, the whole momentum of new technologies and their associated applications to enable their uptake, use and implementation of data and spatial data in particular will continue to emerge and challenge some of these perceptions. The new and exciting initiatives are being implemented across an ever-widening community of users which I think offers many opportunities.

Democratizing new technology

Lidar, drones, satellite-derived data sets for analysis and interpretation, BIM and GIS integration plus the appearance of Big Data and Analytics all feature in recent spatial and geospatial developments. Patents filed by numerous big technology companies have shown a trend towards the spatial sensor and spatial-based data analysis which is probably a sign of how important and strategic spatial data and information has become. It is also likely that this interest and focus will not last, but tools and data will be socialized, tooled and integrated into various mainstream and general applications where they will be all but unrecognizable. Our profession's niche use of thermal imaging, lasers, satellite imagery or 3D structure-from-motion will likely be surpassed through the broad use of these technologies for future applications.

Creating a skilled labour force

So for the developers and technologists there are, I believe, many opportunities. What I think will be much more of a challenge is the creation of a skilled labour force. Where will the surveyors, geospatial scientists, and spatial data specialists come from? The ongoing efforts to promote and develop a sustainable Geospatial education at tertiary level with apprenticeships, undergraduate and postgraduate courses must continue if the smaller boutique courses that offer real opportunities to the students and provide crucial skills are to survive. These specialist professional courses must be supported in order to provide our communities and society with the necessary skills to develop sustainable wealth. This will be a challenge for the decade ahead of us.

▫ Varied and exciting careers in geomatics engineering involve skills ranging from computer modelling and lab experiments to field work. (Photo: University of Calgary)

Around the world, the opening up of spatial data platforms, big data initiatives and internet and cloud-based Mapping as a Service (MaaS) can largely be seen as positive. The challenges of a skilled workforce remain, as do the potential for cybersecurity breaches and nefarious acts based upon spatial data intelligence. How can we develop and promote on the one hand the access and availability of spatial data without somehow compromising on the other side our security? If spatial data really is that sensitive and of national importance, then national agencies and organizations would have to manage access and its use more closely. Some already do this across a number of industry sectors and data types, whilst often leveraging and adapting alternate technologies for their own use. Tracking, monitoring and identifying possible targets of interest, potential threats, suspicious acts or unusual movements could potentially be achieved through legitimate use of the spatial technologies. This is no longer surveying for traditional mapping purposes, but rather a more sophisticated monitoring of activities for protection of the environment, the economy and even perhaps society.

Positioning, navigation and timing

Take the ubiquitous satellite-based Positioning, Navigation and Timing (PNT) as an example. It has generated billions in income and revenue for many companies and nations rely upon it for the ease and availability it offers. Whilst it is, for people in the street, a utility that allows them to get to where they wish to be. However, there is some concern that we are too reliant upon the US military-controlled GPS. Europe developed and launched Galileo which, albeit rather slowly, is designed to be available if GPS is denied to the user. The Chinese are rapidly developing their satellite PNT system, Beidou. Recent launches of two more satellites last November strengthened its place in the PNT community. So these systems are surely a welcome addition to our toolset.

▫ China is rapidly developing its satellite PNT system, Beidou.

Just as early maps and charts were primarily created and designed with military use and strategic planning purposes in mind before being made available to the public, so we now have the Satellite PNT systems. Already they have developed far beyond their initial, somewhat limited, military use to the widest community of all – the public and society at large. So we have before us a challenge of increasing our access to spatial data and its widest availability, whilst preserving the strategic benefits for our nations' and society's protection.

The technology paradigm of expecting new things to always generate some improvement may not be sustainable in the geospatial world. We have good quality geospatial information but can we make it available for all, whilst preserving the strategic benefits of the analysis for ourselves? This will be another challenge for the decade ahead.

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