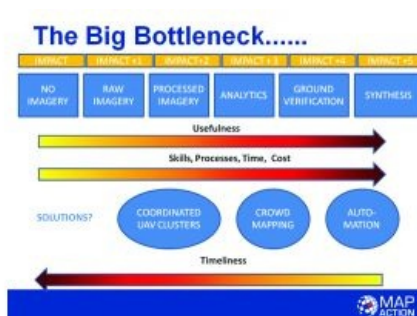# Balance and Buzz - GEO Business 2018

Without a doubt, this year's GEO Business was the biggest and best yet. The heart of the event is the exhibition and this year there were 203 exhibitors from 25 countries. It even overflowed onto the balcony above the main hall. The one day conference featured some high profile speakers, there were 19 seminars covering a wide range of topics, and getting on for 100 exhibitor workshops.

The workshops enabled potential customers to hear more detail on exhibitors' products, but with these the objective is ultimately to sell. For those who were looking for something more independent there were the seminar sessions. Locating the seminars in the exhibition space helped to give the event 'buzz'. Maintaining interest into the second day is the challenge for event organisers. This year, the conference was on the second day and it seemed to work, with visitor numbers seeming to hold up well.

With so much going on, the GW reporters could not attend everything, so this report covers the conference and a sample of the other activities.

Powering the 4th Industrial Revolution

The conference comprised of four sessions with the theme of "Geospatial - Powering the fourth Industrial Revolution", the presentations concentrated on showing how geospatial was transforming government and benefitting society and businesses. The first session started with a presentation from David Wood, Head of Geography in the Government Science and Engineering group, on Growing the Geography profession in Government with the aim of developing a strategy to grow, professionalise and champion geography across government.

Digital Transformation

Mark Enzer, Chief Technical Officer of Mott MacDonald, gave a very interesting talk on digital transformation in economic infrastructure in which he expressed high hopes for this in the built environment, which is falling behind other industries. Enzer noted the importance of government reports on Industrial Strategy, Transforming Infrastructure Performance, and Data for the Pubic Good. The latter is particularly interesting (www.nic.org.uk/publications/data-public-good/) and included recommendations for A Digital Framework, National Digital Twin and a Digital Framework Task Group. He noted that infrastructure is now mature, rather than growing, as it has been developing it for many years. The industry puts a value on physical assets, but not yet on their Digital Twin.

Geospatial Commission

William Priest, Director of The Geospatial Commission, stated that the Commission has been set up with support from the highest levels in government to deliver economic growth and improve productivity, drive investment to foster innovation and protect and enhance the quality of the UK's world class data assets. Priest sees the major challenge as removing impediments to growth, which include licensing, data accessibility, adoption and co-ordination.

Growing the Economy

The session finished with a panel debate on how geospatial will enable the growth of the economy. Andrew Trigg gave a telling example of how efficient use of data held by the Land Registry will improve buying and selling a house and reduce the time taken to a few days. A key component of making efficient use of existing data as means of helping society is sharing data across departments. Ed Parsons from Google noted that for 95% of its life, a car is parked and that geospatial data and AT can help the use of autonomous vehicles and car sharing to enormously improve the quality of life and the efficiency of using resources.

Transforming Society

The second session was chaired by James Kavanagh, Director of the RICS Land Group, which started with a presentation from Alan Mills, Preparedness Coordinator at MapAction, on using imagery to best effect in disaster relief. He noted that imagery is not much used and that operating UAVs in disaster areas presents many problems. The bottlenecks are shown in figure 1, and illustrate the general situation

in using geospatial data.

Zulf Choudhary, Managing Director of Sparta Digital, spoke on AR and Geo location impacts, again showing how work done with CityVerve in Manchester supports tourism and benefits from crowd sourced data.

Geospatial Innovation

Session 3 of the conference included a talk from Laura Alderson of the GeoVation hub who compared the ways that start-ups and corporates operate and how they can benefit from each other. Corporates need to stay relevant and to do that need insight into new markets which can come from engaging with start-ups. Start-ups on the other hand can benefit from industry expertise and mentors from the corporate, its networks and resources. That was followed by a presentation from an innovator, Tim Ollyer from Flock, one of the GeoVation hub's graduates. Flock provides real-time flight risk information for drones. The problem is that insurers have difficulty assessing risks associated with drone flights. Flock collects and analyses relevant geospatial and other data to come up with a risk score, which then feeds in to calculation of premiums.

Growing the Cake

The first talk in the final session of the conference was from John Remedios of the National Centre for Earth Observation. He described some of the work being carried out using EO in connection with ice pack thinning, global biomass and sea temperature. In the following talk, James Bruegger, Investment Director at Seraphim Capital, reckoned that space is now at a 'PC moment'. Costs have plummeted due to smaller payloads and this is resulting in constellations of low cost satellites.

The session ended with a presentation from David Norris, Technical Director of Plowman Craven. They have always been early adopters and see development as a series of mini revolutions. This has enabled them to take advantage of the opportunities to grow the business into new markets as they arise. For each market there is a need to bring in new skills, but as Norris said, "it's still just geospatial data". Most recently there has been a resurgence in photogrammetry thanks to structure from motion and this has seen the company develop a system for modelling railway infrastructure using aerial photography from a drone platform. They are now looking at scanning for construction verification of buildings during construction, component-based functional models, digital twins and augmented reality.

The Seminars

The seminar on Smart Cities included a number of examples of work characterised as contributing to smart cities but did not get into a general discussion. Richard Wooding from Ordnance Survey made the point that Smart Cities should create better outcomes for citizens, break down silos and generate other unforeseen benefits. Partnerships between organisations and businesses are essential and SMEs are necessary partners because they are lighter on their feet. There is also a prime need to look at what customers want and to disrupt traditional business models.

An interesting presentation from Philip McAleese of See.Sense, a company which makes cycle lamps, described how data was collected from IoT sensors in the lamps. Once again, the trial was held as part of CityVerve in Manchester. Information is collected on speed through junctions, number of stops, road surface analysis including changes, activities on roads with cycling infrastructure, and perception analysis. Pick up bikes could include IoT devices and other applications could include health information.

The seminar on Visualisation, AR and VR demonstrated that the technology in this area is developing but still hampered by the cost and awkwardness of the helmet/viewer. The emphasis of the presentations was on the visualisation side of the topic and on efficient data capture, but without any concentration on accuracy. What was interesting was the application: FM inspection and location of features is important and clearly overlaps with the life cycle of BIM, except that there is no interest in the accuracy which is expected from BIM. One speaker summed things up as science fiction becoming reality.

Environment

The Earth Observation seminar was very popular with standing room only. The theme of 'analysis ready' data was first put forward by Pascal Coulon from Defra, but this theme was echoed throughout the session. The other significant topic was Interferometric SAR (InSAR) used for deformation and subsidence. New SAR constellations are promised which raise the question of how to efficiently produce analysis-ready data from complex SAR processing.

The floods seminar session featured three wide-ranging talks. Paul Drury of Ambiental described how his company is using modelling to predict how flood risk will change as a result of climate change. They have taken the three scenarios developed by the IPCC, have produced rainfall maps and analysed each scenario with 54 datasets to produce flood maps showing the risk of flooding from all environmental sources. Other than the 'low' scenario, the effect in terms of numbers is quite alarming. The mid projection would result in 25% increase in properties affected by flooding and the 'high' scenario sees a 34% increase. Just as alarming is the predicted 105% increase in river flow, so they have also looked at the risk to bridges and the potential for increased river erosion, which could cause the pattern of meanders to change.

Dan Culli (of Critigen) and Gary Nel (of Geocurve) are working on the Environment Agency's TEAM2100 project through the framework consultant Jacobs. They gave a talk on use of laser scanning and imagery to survey London's and the Thames Estuary's tidal defences. Their task is asset management. They have been using aerial photography from drones for survey and 4k video to inspect the tidal embankments and walls. This year they purchased a Leica Pegasus:Two Ultimate with Z+F Profiler 9012 and a Leica: Backpack. The Backpack has been used to survey the land side of the walls on foot. The Pegasus:Two Ultimate is used to survey the river side of the walls and foreshore by mounting it on a boat. They claim to be able to survey 20km of river wall in a day within a three hour window around low tide. The survey is being repeated quarterly. The result will be 200TB of data which is too much to deliver through the team's 'Estuary Eye' GIS, so there is an on-going debate on how to deliver the data to those who need it.

The session was completed with a talk from Richard Groom on the Environment Agency's standard format for river channel surveys –

EACSD. He pointed out that an increasing amount of survey work is now being procured by framework consultants. Surveyors should look out for the new framework due next year and cultivate their consultants, he advised.

Utilities

The Utilities seminar started with a talk from Ian Bush of Black and Veatch on PAS128. He ran through the process of producing a PAS and noted that BSI had sold 400 copies of the standard, almost double the number they would normally expect to sell. PAS documents should be reviewed every two years and there are many lessons learned to feed into the coming revision. He pointed out that the PAS is aimed specifically at practitioners, not clients. To fill this gap, TSA has produced the 'TSA Essential Guide to PAS128-2014' and 'TSA Client Guide to PAS128' which can be downloaded from www.tsa-uk.org.uk/downloads/. Those who want to be involved with the update of PAS128 should write to howard.brown@bsigroup.com. The search is also on for sponsors and review panel members.

Dr Neil Brammell said that lots of work is being done to the PAS128 standard but that none of it is finding its way back to the records of the utility companies. His company aims to close that circle by providing utilities with validated data and a proper estimate of uncertainty. He is establishing a "community of benign self-interest" with this purpose in mind. Contact: neil@utilitysurveyexchange.com.

Finally in the utilities sessions, Nathan Ward (Select Surveys) spoke about augmented reality. It's all done with the Augview app which takes data from Augview projects with the aim of better understanding of underground utilities whilst on site.

Heritage and Monitoring

The Heritage Seminar session was on Day 2 and opened with a talk from David Andrews, Geospatial Imaging Analyst at Historic England (HE). He opened the surveyor's toolbox and described some of the techniques that HE now uses. He made the point that complete models can generally only being made by combining technologies. For example, terrestrial photography of a building will not record upper storey window sills.

In the Instrumentation and Monitoring Seminar, John Brewster described a monitoring system developed by his company Imetrum Ltd. The system uses a total station equipped with a coaxial camera, and image matching algorithms to detect the movement of image patterns in the field of view. If there is no image pattern, it will not work. The time and cost needed to gain permission and to establish prisms when installing total station monitoring systems is significant, so a system which does not need prisms is good news. It uses reflectorless EDM to observe the third dimension. Brewster claims that the system can detect movements of 1/500th of an image pixel. It has been undergoing benchmarking tests over 18 months and Imetrum are planning for the system to be in production in 12-18 months.

Marco Di Mauro from Leica looked at the effect of faster digital communication, innovations and cloud computing on monitoring. He said that the coming 5G communications have almost negligible latency compared with 3G and 4G – perhaps that is also significant for real-time network RTK. In particular, he mentioned automated scanning to measure surfaces and apps which can compare two sets of data and calculate orthogonal offset between monitoring points. It is now possible to integrate data from any type of sensor and have the full workflow on the cloud.

Apprenticeships

There was a special session on apprenticeships. Christina Hirst and Mark Lawton brought the audience up to date. There are now providers signed up to deliver courses: for the Level 3 apprenticeship, Dudley College and Leeds School of Building and for Level 6, University of East London and Newcastle University. The course at Dudley started on 25 June. The possibility of a distance learning Level 3 course is also being considered. For details of the standards visit: www.instituteforapprenticeships.org/apprenticeship-standards/?keywords=geospatial. The website includes a search for providers which seems to search locally by postcode, so it is better to contact the colleges direct for the latest information.

The Exhibition

The exhibition was impressive and very busy. All the big organisations were represented and many survey companies from the UK and overseas also had booths. There was an education zone, a start-up zone and a drone zone. Exhibitors were also demonstrating equipment and mobile mapping systems outside the building. Total stations, scanners, and complete systems were the most visible displays. Drones were not as obvious as in previous years, but companies producing navigation components, including GNSS receivers for smart phones or tablets, and sensors were in evidence, including lidars for drones. There were also companies offering drones as a service. Software companies included Clearedge, Terrasolid and many smaller companies. There were several hydro companies.

Techniques for scanning included trolleys and backpacks, and software companies offering automatic scan data recognition such as Vercator, which presented results at the RICS in the autumn, were also present. Robotics, virtual reality and augmented reality were also evident.

In a Word

This year there were 2,602 visitors from 53 countries. That is a 9% increase on last year and a rise of 61% since the event was launched in 2014. And so the event goes from strength to strength. GEO Business will return to the Business Design Centre next year on 21-22 May.

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