REAL-TIME MODELLING

How can we address the need for frequent large-scale mapping in order to model real-time change?

My job requires frequent travel, and one thing that regularly strikes me during my trips is that we are living in a time of rapid change. Cities are changing due to growth, rural areas are developing as transportation infrastructure evolves, farmlands are adapting to feed a growing population and our urban areas seem to be multiplying overnight to provide housing. At Hexagon, we are fond of the saying 'You can't manage what you don't measure'. In the context of these changes, 'measure' means 'map'. The challenge with such rapid change is that it outpaces the way we map. We recognize that changes have occurred, start a lengthy process to secure a budget, issue a tender and acquire new data to capture the changes. But the new maps are often too late to be useful to manage the change and simply confirm what we already know. To keep up with our changing world, mapping also needs to change. To achieve this, the old model needs to evolve into programmes that continuously capture and make updated map data easily available. Such 'content as a service' (CaaS) programmes collect data according to consistent specifications and continual refresh schedules, creating a standardized product suitable for many applications. The users of these applications are collectively underwriting the collection cost and can, therefore, pay a significantly reduced price. Using the principle of a sharing economy gives everyone equal access to the same data, and as such, democratizes high-quality aerial data – a previously highly exclusive commodity. The second necessity is more efficient airborne sensing technology which enables the collection of more data in a single flight to reduce the time and cost of making maps. However, the sensor alone does not get the job done. With growing amounts of collected raw data, processing speeds need to be increased in parallel, allowing for the swift delivery of the processed data to the end customer. Hybrid sensors and workflows that capture and process imagery and Lidar data simultaneously will be the driver to map large-scale projects more frequently. At Hexagon, we have invested in making this a reality and will continue to do so. With our network of collection partners, the HxGN Content Program – our CaaS initiative – is now entering its seventh year of continuous collection. The programme has captured 25 million square kilometres of data in North America and Europe which is easily available online via purchase or subscription models. In 2016, we launched the world's first airborne sensor that simultaneously captures nadir and oblique images and Lidar elevation data: the Leica CityMapper and HxMap workflow. And in 2019, we announced a 40% productivity enhancement with the CityMapper-2, allowing airborne mapping companies to collecting more data during every flight.

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SELECTING GEO-DATA ACQUISITION SYSTEMS

How can we choose between the many geodata acquisition systems when our equipment needs replacing or we are expanding due to business success?

This seemingly simple question is surprisingly hard to answer, so I will outline some considerations. Improving workflows focused on a few, well-defined applications entails other concerns than when multiple business fields are covered. If your focus is on sparse point measurements in urban areas, it may be sufficient to extend your total station fleet with high-accuracy GNSS receivers. If you are growing your business through terrestrial laser scanning as a novelty, you should consider questions such as: How will you approach potential clients and retain existing ones? And do you have the necessary in-house expertise to use the new equipment, or should new staff be recruited? The time needed to retrain staff in mastering new equipment and workflows is an often underestimated cost factor. Does the design of the equipment anticipate technological developments that lie ahead? In other words, is the equipment future-proof? Can it be upgraded without high costs, or even booted up at the touch of a button? One example is the GNSS receiver supplied with hundreds of channels for capturing future GNSS signals so that outages in urban canyons and under canopy will steadily diminish over time. What is your company's vision for the future? An aerial survey company that restricts itself to 2D mapping only will have other concerns than one that envisages 3D mapping and other new services. The latter may be interested in camera systems with oblique viewing heads or even a hybrid system equipped with cameras plus Lidar. Equipment and processing software are intertwined like fuel and oxygen in an internal combustion engine. Data formats should allow easy import in subsequent steps in the workflow. Should the transition from one workflow to the other be gradual or sudden? Some topographic agencies may prefer to continue using analytical photogrammetry in parallel, perhaps because the equipment is not yet amortized or the workforce is not yet flexible enough to dive into digital photogrammetry.
Advanced equipment that is not yet in widespread use can give you efficiency gains and hence a competitive advantage without compromising your revenues, especially in the beginning. But buying equipment also means buying the vendor's services and support. When you surrender yourself to a third party, a soft criterion comes into play: trust. In larger organizations, decision-makers may have a non-technical background. Steered by budgetary constraints, their main deciding factor might be the purchase cost. However, what initially seems cheap may turn out to be expensive in the long run... the devil is in the detail.

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