Article
Internalizing LIDAR Data Processing

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At GeoCue Group we are involved with customers across the mapping industry, from hardware designers through data collators and data analysts to end users, so we often get asked the question, "how much data processing should I do myself?" It is a great question. How much of any given business process you decide to internalize must be a key part of your overall growth strategy. Unfortunately, we often see companies making one of two classic mistakes when approaching this question about bringing LIDAR data processing in-house.

The first mistake is to decide to do something just because you can, and being smart engineers and scientists, we all believe we can do LIDAR data processing! In fact, from a practical point-of-view, this is probably very true. Most engineering, survey and mapping firms have the technical capability and skills already on staff, or can acquire them by hiring experienced people, to take on LIDAR data processing. LIDAR data is no more complex than many of the other geospatial data types companies routinely process in-house. It has some unique aspects to it, but the workflows, tools and techniques are very teachable and can be learned, although there is no substitute for experience. But, just because you can do a thing does not mean you should do that thing. For LIDAR data processing, a compelling business case must exist to justify internalizing the process.

Let's consider the case of a company that is currently subcontracting out all their LIDAR data production. Typically, they will be receiving geometrically correct, fully classified point clouds as a deliverable. There are usually two questions such companies ask when looking at what, if any, of that work would be better done internally. First, do we want to and can we afford to get into the data collection business by buying hardware? Second, if we don't buy a sensor and continue to pay somebody else to collect, how much of the data processing should we do ourselves? The hardware question is usually driven by larger business considerations than we are discussing here, given the level of capital investment required. There is also a clear difference between taking on work that involves field data collection and all the logistics that go along with those activities and taking on what is essentially another back-office data processing workflow. We usually recommend that if you aren't already doing field work, don't decide to get into it by starting with LIDAR data collects. But what to do about the back-office data processing is always an interesting question for any company. The advantages of bringing LIDAR data processing in-house are often characterized in terms of cost-savings – our subs are charging us way too much! – and schedule control – our subs are always late!

The cost-saving argument can be a strong one, but it requires careful analysis. When we discuss standing-up a LIDAR data production team of three to five staff, we recommend companies allocate an estimated $65,000 to $95,000 for software licenses, classroom training and updating their IT infrastructure. The minimum investment, for the smallest operations (single technician, existing IT hardware, limited training) still is going to be in the $20,000 - $25,000 range. The annual lifecycle cost to maintain this capacity likely will run around 20% per year covering software maintenance, support, and annual training. So, the five-year capital investment for our 5-person team is going to be around $175,000 or approximately $35,000 per year. The labor costs are going to be the big variable cost; if you have enough work to keep your new production team busy full-time doing LIDAR data processing, the

salary and overhead for a five-person team for the year likely will be significantly larger than your actual capital investment in the software tools.

Unfortunately, it is here that many companies get side-tracked. They see the large up-front capital investment required for the software and training and struggle to get over that hurdle – because usually someone must be convinced to sign an actual purchase order for this amount! – even though in the long run it is likely the labor costs that will determine the profitability of the venture, not the initial set-up costs. We often hear from companies that want very detailed breakdowns on pricing and technical capabilities of the software to support their business case but can't tell us exactly how many people they plan to have working on the data processing or what the annualized labor burden will be. They focus too much on the software price and not enough on putting the software investment in the context of an overall business case. Ultimately the actual financial determination in this case is straightforward; if the company is paying more than $35,000 + X per year (where X is the organization's labor burden based on their projected workload) for LIDAR data processing, they can save money by bringing that data processing in-house.

Control of the data processing, especially schedule control, is the other common justification for internalizing LIDAR data processing. However, our experience has shown this is often a red-herring. Poor performance on past projects is more likely to indicate a problem with the choice of subcontractor rather than a process issue. There is nothing that internalizing LIDAR data processing will do to improve upon best practices. If you do decide to internalize, getting trained on best practices is critical! We work with the best LIDAR data producers in the world and by applying best practices, being rigorous about workflow management and applying constant quality improvement, they all produce great products on time and on budget. We firmly believe any company that is willing to invest in the proper software tools and well-trained people can achieve the same results by internalizing the process. Controlling the data processing does offer the potential to build efficiency improvements into your processes over time that can help reduce delivery schedules, but any credible subcontractor will be doing the same and passing those savings on to their customers anyway.

The second common mistake we see companies make in building their business case for internalizing LIDAR data processing is to delay full implementation or adopt a slow rollout strategy. LIDAR data processing is one of those activities that benefits greatly from economies of scale and "doing the work." Achieving a critical mass of expertise on staff and having a constant workload is very important to a successful internalization program. Having a plan where staff will work on LIDAR part-time or only at certain times of the year or only on a certain customer's projects is usually a very high-risk choice. Even if financially the business case appears strong, we often caution customers that if they aren't going to truly prioritize LIDAR data processing as a core competency and build a sustainable pipeline of work from Day 1, they may be better off staying with a subcontractor. Often rather than slowly ramping-up to a successful deployment, they end-up slow-walking down a dead-end path that leaves them with only a bare minimum of internal capability, though having invested heavily in the software tools and training. In the worst-case scenario, these are the companies that we see exit the LIDAR data processing business after 18-36 months with little to show for their investment. The best way to mitigate the risk of a stalled or under-utilized deployment is to avoid a piece-meal deployment plan; if the financial business case for internalizing LIDAR data processing is there, then be aggressive!