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Disruptions are Both Threat & Opportunity

The rapid expansion and commoditization of 3D imaging technologies, resulting in ubiquitous geolocation and inter-connectivity, can enable not only the automation of individual activities, but also mutual awareness and collaboration among robots performing various tasks. This is already happening within many production plants and is expanding into open environments, thanks to robotic vision/sensing and increasingly sophisticated, constantly learning algorithms. Artificial intelligence, 3D sensing/imaging, interconnectivity, Cloud and, of course, robotics are all foundational technologies for the

Location is critical for letting the digital world get to work with the physical world. Many industries, such as manufacturing, transportation and logistics are already embracing these radical changes. Governments, in turn, are being forced to deal with these technological advances in areas such as regulations and legislation (e.g., UAVs, autonomous vehicles, workplace safety) or with drastic changes in urban/infrastructure planning and management.

Democratizing geospatial industry

A great deal of innovation in the geospatial industry has come from within, but external drivers such as UAVs or autonomous vehicles have also created a new type of demand for geospatial data and spurred further innovation and disruption. LiDAR has gone from an arcane, very niche technology to being a critical part of the broad consumer market in a very short time, thanks to 3D printing and the push for autonomous vehicles. In the process, they are pushing LiDAR manufacturers to radically reduce size, weight and power consumption of their instruments. This is democratizing the geospatial industry, and driving innovation at both ends of the spectrum — high-accuracy data over national-scale areas, as well as low-accuracy local data at a very low sensor price.

As with any technological disruption, disruptions in geospatial domain create both a great threat and a great opportunity — just read Clayton Christensen's *The Innovator's Dilemma* to see how

> **Geospatial industry is moving in the same direction as every maturing market — users are looking for end-to-end solutions**

threatening, even deadly, disruption can be even for very strong, established players. And the pace and extent of disruption nowadays is much greater than it was 20 or 30 years ago. However, the positive side is that the demand for all types of geospatial data is rapidly increasing, so there is undoubtedly a great opportunity as well for the companies who are nimble enough to embrace or, if possible, drive these disruptions.

Demand for well-integrated solutions

The geospatial industry has been moving in the same direction as every maturing market, i.e., users are starting to look for end-to-end, well-integrated solutions. For sensor manufacturers, this clearly creates a challenge. Teledyne Optech has been working to meet customer expectations by integrating third party software into our processing software so as to provide a single interface to the user. We have also partnered with downstream software providers to offer a seamless data transfer through a loose integration. Finally, with the acquisition of Caris, Teledyne is enabling us to provide a complete, compelling workflow in the bathymetry market segment.

There is no doubt that product lifecycles are getting shorter, and this is a source of concern for many service providers. Competitive technology innovation and new entrants are driving companies like us to accelerate and expand our innovation roadmap. We are also looking beyond traditional market segments and partnering with innovators to co-develop new products quicker than before. To successfully execute this challenge, we are redefining our product development and production processes and are investing in better collaboration tools to more effectively engage partners within and outside. ⊘