

Geotechnologies today April 2020

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When we stop for a little to observe how the dynamics of our lives take place, we can verify how much technology is present and, in many cases, how it controls us.

- This conclusion also applies to engineering, which has experienced extraordinary progress in the last 30 years with technological developments. In the case of geotechnologies, this advance is even more sensitive, because in addition to the evolution of equipment and software for the collection and treatment of information, it made it possible to obtain it and make it available in an increasingly shorter time frame, with surprising precision and level of details, leading us to immerse ourselves in a virtual environment that brings to reality what is still a concept.
- With these tools, the ideas left the imagination and can be materialized at a stage that allows us to adjust and improve before implementation, increasing efficiency and adding quality to the products.
- If we look at obtaining and applying geospatial data, we easily become amazed at how the massive use of this information is present in our daily lives, as well as it also influences the most diverse areas such as the economy, health, environment, heritage, transport, military, logistics, security, social communication and education.
- Take, for example, the smartphone, which represents the most surprising way in which this technology, which for many is imperceptible, makes available in a few "clicks" an almost infinite range of applications, such as the use of transport and delivery applications, perhaps the most used in the world, that allow the user to use a service, which has as its basic premise his geographical location data.
- The evolution of urban centres to the concept of Smart Cities is another example that we can mention of the use of geotechnologies. This concept is related to smart governance strategies and actions. Information and communication technologies are commonly part of this new concept of cities, making them interconnected with society and the state. Note, however, the inter and multidisciplinary that make up the studies carried out for the implementation of smart cities, which even permeate Information Science. In this context, geotechnologies support the integration of solutions to the Smart Cities management concept, either with technology in the provision of services necessary for the operation of its implementation, or in support of the provision of technological solutions for the integration of technologies. Geographic information is necessary for the most diverse branches of activity with regard to Smart Cities. It is necessary in the implementation, development and daily activities.
- When analysing the application of geotechnologies in engineering, especially in civil engineering, we see a real revolution. What a few years ago was restricted only to use in research and defense centers, such as satellite images, are now present as basic tools in engineering.
- Not to mention the evolution of the surveying and inventory processes, through technologies that use laser to obtain data, surprising with the high precision and level of detail, and bringing to the office a faithful representation of the environment

that was surveyed. Even more impressive is how we can obtain this data. Mobile mapping equipment can be installed on aircrafts, drones, boats, motorcycles, bicycles or, simply, in a backpack attached to our body, which when we collect data, without requiring natural or artificial lighting to seem what is being surveyed.

- **Geotechnologies are increasingly evolving towards the use of solutions that interfere as little as possible with the environment, thus being more sustainable.** We can see, as an example, the use of GPR (Ground Penetrating Radar) that uses the emission of electromagnetic waves to accurately identify buried infrastructure such as pipes, optical fiber, technical networks, galleries, archaeological objects, among others, avoiding unnecessary excavations, as well as possible damages to these buried structures.
- Thinking about numbers, the market that involves geotechnologies exceeds 10 billion euros annually, with estimates of reaching 200 billion euros in the next 10 years, with emphasis on mobile mapping, LiDAR, aerophotogrammetry, drones, remote sensing, geoprocessing and GIS applications.
- **Observing the speed which the technologies are evolving, through a change of paradigms in engineering in a global way, mainly in the use of the technological evolutions in the countries considered in development, that must pay attention to the importance updates.** They also need to invest in the use of solutions that are consistent with the new world reality, where globalization and interrelationship among nations, in all segments, will be fundamental to support development.
- As utopian as it may seem, humanity, in need of survival, will migrate to an economic-social as well as environmental balance, where science and, among it, geotechnologies, will have a fundamental role in achieving this balance, since Knowledge is a fundamental pillar for sustainable global development.

In FUTURE Group we believe in the decisive role of geosciences in the search for sustainable development. That is why we have created the GEOLAB Business Unit, which responds to these challenges.

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