Twelve technological innovations in the construction industry

Like many of the most traditional industries, construction has also joined the mainstream of progress, both in materials and techniques, as well as tools. The usual procedures have not lost their importance, but technological innovation is advancing, making huge leaps.

The worldwide value and importance of construction are indisputable. A good example of this is the multiplier effect of their advances between related industries or the capacity to generate employment. Therefore, the implementation of new technologies in this sector is being boosted, solutions in the market are launched on a daily basis, to pursue optimization throughout its value chain.

Construction is undergoing an unprecedented transformation: the development of some technologies is allowing innovation that is expected to change the traditional image of this industry.

New materials

Translucent concrete: Over the years, concrete has been modified, improved and adapted to construction needs. Although still considered experimental, translucent concrete is a major innovation in the sector. This is polymeric concrete that includes cement, aggregates and additives in its composition, allowing the passage of light and providing superior mechanical characteristics than those of traditional concrete.

Self-repairing concrete: According to Oficemen, the Spanish Association of Concrete Manufacturers, concrete is the second most consumed material in the world after water. Its popularity led to multiple research initiatives, such as that of the Delf University of Technology, in which a bio-concrete capable of repairing itself was developed. Capsules containing bacteria and calcium lactate are inserted into the concrete: if a crack occurs, the next rain breaks these capsules, causing a chemical reaction that repairs the crack.

Aerogel: One of the most innovative products for thermal insulation. Originally used widely in the aerospace industry, today, it is making its way into the construction sector. It has a texture similar to polystyrene once hardened, and its solidity is similar to glass.

Sustainable materials: Environmentally friendly buildings are prominent, and there is a material boom taking place, towards minimizing CO2 emissions. This is achieved by using recycled, natural or locally sourced materials. In addition, efficient models that generate less waste during their manufacture and take into account both their useful life and their subsequent recycling are being used.
Innovative techniques

Drones are an advantage due to their autonomy, the possibility of adding other equipment to their structure and their application in complex tasks, thereby replacing human teams.

**BIM:** The greatest promise in modernizing and improving the construction sector. Building Information Modeling (BIM) is a collaborative work methodology that centralizes, in a digital and accessible database that is updated in real time, all information related to the construction and management of the infrastructure.

**Augmented reality (AR).** This technological innovation seems to be revolutionizing one of the oldest professions in the world. Thanks to AR, it is possible to unite virtual architectural projects with the reality of the terrain where it is built, reducing errors, saving time and resources, as well as increasing accuracy and efficiency.

**IoT:** The Internet of Things makes it possible to optimize all types of processes, and in the field of digital innovation, construction is one of the sectors with the greatest potential when it comes to applying its solutions. It can be applied at different stages of the construction process and offers great advantages both in the first phase of calculation, planning and design, as well as in subsequent on-site works.

**Prefabrication:** Prefabricated parts save 70% of energy and 50% of water consumption, improving the efficiency of the construction process, as stated by Shaanxi Construction Engineering Corporation. Shaanxi Construction Engineering Corporation is a Chinese company, one of the first to opt for this methodology. Prefabricated parts also reduce pollution and noise, generating little waste.

**Versatile tools:**

**3D Printing:** The benefits of this development have been seen in all industries, with construction and urbanism already benefiting. Currently, there are no devices capable of printing entire buildings, however, the trend is clear: places like Dubai have imposed by law that, by 2025, a quarter of every building constructed will have to be made by 3D printing.

**Construction robot:** Five years ago, the Australian Mark Pivac created the Hadrian X robot, capable of laying 1,000 bricks per hour. For some months now, this amazing bricklayer robot has been working on real-life projects and building its first houses. In fact, it does not just lay bricks: it cuts blocks with millimetric precision and lays adhesive, among others.

**Drones:** These devices are an advantage due to their autonomy, the possibility of adding other equipment to their structure and their application in complex tasks, thereby replacing human teams. In the construction world, they are used for land exploration and the creation of visual content for the purposes of inspections and safety guarantees. This technological innovation reduces operating time, risks and costs.

**Pocket LIDAR:** LIDAR is the most accurate and efficient tool to verify that any finished
construction phase corresponds to the digital BIM model. To date, the most frequent scanning equipment has been bulky and somewhat uncomfortable. Now, thanks to two of the tech giants: Apple and Google, a mobile app that makes it much more convenient has been developed.