

4 major digital trends in construction for 2020

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28 Feb 2020

From cloud computing and artificial intelligence (AI), to 5G and mobility, a key trend in 2020 is the accelerated digitisation of construction companies. This is critical for future proofing their businesses and maximising efficiency and profitability.



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As one of the least digitised industries in the world, with about 1.5% of revenue spent on IT compared to an average spend of about 3% across all industries, the construction industry has suffered a notable lack of growth in productivity. This is in contrast to the manufacturing industry, which has embraced technology significantly – relative to construction – and recorded a consequent increase in productivity.

By embracing digital technology, construction companies will have more efficient control over their costs and be able to collaborate more effectively on projects, especially mega projects.

1. The power of cloud computing

Digitisation requires an enormous amount of computing power. A good example of this is the design phase of a project. Over the years, the design process has evolved from designs being created on paper, to the use of CAD tools and, today, through 5D BIM modelling.

Now, with virtual reality, the internet of things (IoT) and artificial intelligence (AI) also coming into play, the design aspect requires vast computing capacity. Setting the computing infrastructure up and employing the right skills to maintain it would be an expensive – and unnecessary – exercise for a single company.

The likes of Azure, AWS and Google Cloud have made large amounts of computing power easily accessible to companies around the globe. It is accessible, safe, relatively cheap and maintained by experts.

This allows users to handle much more data, more efficiently and more securely. Once construction companies have garnered big data in the cloud, it can be converted to smart data, allowing them to access comprehensive analytics and use these to make informed and more real-time decisions about current and future projects.



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2. Artificial intelligence and leveraging big data

AI allows construction companies to harness big data and make sense of it. New algorithms are written every day to analyse big data and leverage it in an effective and productive way.

There are numerous use cases for AI in construction. For example, CCS has initiated a proof of concept (POC), using robotic process automation (RPA), to design and build a software robot that is able to read an organisation's mobile phone

statement and process it in conjunction with the invoices in its ERP solution, BuildSmart.

Previously, this process could take an accountant up to two days to complete. The robot, however, is able to read the statement and invoices, extract all the required data and process the purchase order along with various Excel reports in just over eight minutes, with a 100% accuracy every time. This allows the accounting team to focus on work that adds more value to the business.

In the construction industry, hundreds of deliveries from multiple suppliers are made to construction sites every day. Traditionally, a clerk would capture every delivery note manually, a labour-intensive and time-consuming process. AI allows this to be done rapidly and accurately, freeing employees up to interrogate the quality, quantity and relevance of the products ordered.

AI is also highly effective in interrogating past projects. One of the big opportunities in the industry is for estimators and project managers to learn from past projects. Much of the knowledge rests in their heads, which is then used to improve the scheduling and costing and estimated for upcoming projects. If all historical data is stored on a database, AI will be able to prepare more accurate predictive models, making future projects more productive and predictable.

Another higher use case for AI is in 3D modelling. A big issue in planning and designing projects relates to design clashes between different engineers or stakeholders. When something is being built, there will typically be several designs for different aspects of the project – architectural, mechanical, electrical, amongst others. Often, when they are overlaid, there are clashes. AI has the ability to help detect these clashes and adjust designs quickly.

The holy grail of construction is to have 100% design before construction commences, that is, no changes during the course of a project. Of course, this rarely happens, but it's what everyone strives for. AI enables users to simulate a 3D model to determine whether it is constructible and can be constructed cost effectively and within the clients construction deadlines. By exploring different scenarios, in terms of what happens first, second or third, AI can help optimise the construction process. This saves time and money, something that can have far-reaching benefits for a country like South Africa where changes to projects such as Medupi and Kusile have resulted in an enormous amount of cost and time overruns.

Yet another use case for AI is risk management. By harnessing historical data, it allows for greater understanding of project complexity. It can analyse complexity factors around issues such as design complexity, labour availability and weather patterns and place them into risk management models, allowing for greater risk mitigation.



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3. Greater connectivity with 5G

5G gives everyone access to greater connectivity. It offers higher speeds and a more reliable and bigger capacity, which ties in with construction companies' need to harness big data. Once they start digitising their business processes, construction companies will create huge amounts of data.

One of the major constraints for site-based solutions has been a lack of connectivity to construction sites. 5G will take it to the next level in terms of reliability, speed and capacity. This will allow for more data collection, data management and data analysis on site, which will allow project managers to make informed decisions, more quickly.

4. Mobility

Mobility has already taken hold on construction sites, with laptops, smart phones and tablets allowing people to conduct work in remote areas, capture data and complete tasks that were ordinarily paper based.

One example is clock carding or time and attendance-type systems. In the past and at many sites today, attendance at construction sites is recorded on paper, which then gets captured into some system. Today, this can be done more accurately and effectively via mobile phones or tablets.

The next level of mobility relates to wearable technology. Think Microsoft's HoloLens, which offers the ability to mix virtual reality with reality on the construction site. With the lenses, users are able to see the design and if they look into a room, they are able to see how it is meant to be constructed. It allows users to detect defects and pull up diagrams showing the correct design. While it may not manifest in the construction industry in 2020, wearable technology is definitely the next big leap forward.

3D scanners are another form of mobile technology that are invaluable for the construction industry. When a building is being constructed, 3D scanners can be used to scan rooms, measure them and create as-built drawings.

Drones are becoming increasingly popular for various construction projects, especially roads. By flying a drone over a construction site every day, users can see what progress has been made in every phase of a project and deliver progress reports to relatively accurate tolerances.

Virtual and physical, side by side

Ultimately, the increased use of digitisation will mean construction companies can create virtual projects alongside their physical projects, allowing them to be more efficient in the way they construct their projects. This is because they will be able to build their construction projects in the virtual world up front, ensuring they are well planned when they begin construction in the physical world. It also allows them to monitor their progress against the virtual plan every step of the way and address issues as soon as they crop up.

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