

How using tech in a 'tools-for-trades' approach hinders construction's digital transformation

The South African construction sector ranks 18 out of 19 when it comes to digital transformation, just ahead of agriculture. And with margins between 1% and 5%, the industry is lagging behind the rest of the economy. RIB CCS enterprise sales manager Quimby Bunce believes that, surely, this represents a case for change.



RIB CCS enterprise sales manager Quimby Bunce

Bunce says there is no shortage of technology used in construction. “While there are plenty of software programmes and technology used to support construction, this does not mean the industry is digitally transformed.

“A shortcoming in construction, particularly in South Africa, is its ‘tools-for-trades’ approach where all players within a project’s life cycle are served by particular tools in support of the roles they fulfil. In other words, project managers, architects, estimators and others each have their own tools that don’t necessarily talk to each other.”

Transformation rests on three factors

He says the real essence of digital transformation rests on three factors – people, processes and data – and how they operate together. “The use of technology in a ‘tools-for-trades’ fashion leads to failure in all three areas, because data ends up in silos associated with each of those applications, ultimately leading to a breakdown in construction processes.”

This breakdown is evidenced by industry's productivity challenges, including its inevitable time and budget overruns, rework and materials wastage. "A McKinsey survey found that 80% of projects are over budget and most take 20% longer to be completed than initially anticipated, with 30% of work performed being rework. In fact, the construction industry has almost flatlined in productivity terms for about a quarter of a century, with growth of a mere 1%.

"This is a third of what the total economy has achieved and, even more damning, scarcely more than a quarter of where construction's sister industry, manufacturing, sits as a leader in transformation," adds Bunce.

Integration missing

The missing piece, says Bunce, is integration. "What is important is how all players on a project interact. For example, once the architects have completed the design phase, how are those outputs passed on to the next people in line."

Every time outputs – in the form of data – move across systems, there is the risk of a loss of fidelity. Data normally loses its richness when it exits one system and enters another. It also loses its fidelity at every point of human intervention, which becomes problematic for the overall construction process.

Digital transformation in construction is about how all players integrate their roles across the construction process and preserve data, so that when people have a job to do, the data they require to do the job arrives on time, can be trusted and can live on beyond the project to support what comes next – the maintenance of the asset. The end-user then has access to information about how the infrastructure was built, the materials used, the names of sub-contractors and the warranties that apply.



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Bongani Dladla 28 Apr 2022



Getting everyone in sync

So, how can everyone working on construction projects sing from the same hymn sheet and, importantly, how can all of the data come together in one common environment in support of all roles?

Instead of site managers working from 2D drawings taped to their site office walls, they should be able to access digital versions (and their updates) in real-time in a common data environment, dramatically reducing the 30% rework that occurs in the industry.

Bunce says while time and cost are easy metrics to sink one's teeth into, creating a common data environment requires investment. "In South Africa, not many people are willing to stick their heads above the parapet. In Europe, on the other hand, the end customers – especially large, public-sector customers – have begun to drive change in this area. They are looking for better information and more predictability around timelines and cost when it comes to their projects."

ISO standard on building information modelling

This, in turn, has driven the adoption of the emerging ISO standard, ISO 19650, which provides an industry standard around the adoption of building information modelling (BIM), the most prevalent common data environment which is centred around the 3D models that emerge from the design phase.

Bunce says 3D models can be detailed or somewhat detailed. “In South Africa, these models are mostly somewhat detailed, with the aim of selling the architectural vision – it’s what I call ‘Hollywood BIM’. With a standard like ISO 19650, the models become much richer and form the core of the data that is preserved around a project.”

Once other people start looking at the model – quantity surveyors, estimators – additional information can be linked back to the model, resulting in the accumulation of metadata in relation to the project. In addition, users can simulate the building process and run scenarios without getting into a situation where they are learning while they build.

“This scenario allows for better planning and project control. All of the associated trades information is linked back to the model. This is how technology can be used in a concerted way to support digital transformation and enhance the way construction companies operate,” notes Bunce.

He uses the analogy of a three-legged stool. “The important part of the stool is the surface that is supported by the three legs. A good digital platform brings the three pillars – people, process and associated data – together in a way that adds value for everyone involved.



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Bunce points to BCG’s *Performance and Innovation Are the Rewards of Digital Transformation*, which underlines six key factors that underpin successful digital transformation journeys, where construction companies achieve an average operating profit increase of about 21%. They include:

1. **An integrated strategy with clear transformation goals.** This involves strategy formulation that moves out of the boardroom to embrace large-scale, participative processes to draw insights from all roles in the organisation.
2. **Leadership commitment.** There needs to be strong leadership involvement at senior levels to ensure that whatever innovation is adopted by the business gets integrated into one cohesive framework for the organisation.
3. **The deployment of high-caliber talent.** This refers specifically to people with high technological proficiency.
4. **An agile governance mindset.** The opposite of the bureaucratic mindset, which is still prevalent in most of construction companies. The preoccupation with innovating and delivering increasingly more customer value.
5. **Effective monitoring of progress.** Setting targets around processes and outcomes – and making sure sufficient data is taken into account to be able to measure whether or not improvements have been made.
6. **Business-led modular technology and data platform.** Adopting technologies that play well in the sandbox with other technologies.

Bunce says a transformative approach is evidenced by collaborative teams, well-defined workflows and centralised accountable data. “A unified platform will provide the vertical capabilities to support the needs of a diverse set of roles, support collaboration across roles and drive consistency using digital workflows that capture best practice.”

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