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CONSTRUCTION & ENGINEERING SECTOR ALERT

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Building Information Modelling: The future is here, and it's #digital

In this series, CDH's Construction & Engineering experts will address key issues facing the South African construction industry and provide insights into its future. Part 1 looks at the current challenges facing the industry and the innovative digital solution of Building Information Modelling (BIM).



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Building Information Modelling: The future is here, and it's #digital

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The South African construction industry suffered a 16,5% contraction in 2020, in large part due to the effects of the COVID-19 pandemic. Statistics South Africa highlighted that the industry's value-add fell by 21,6% year on year in Q3 of 2020, resulting in 259,118 jobs being lost. The construction industry is cyclical in that it gains strength during economic upswings and is negatively impacted by economic downturns, and the pandemic stifled its recovery.

Although 2021 has an expected GDP growth in real terms of 6,1% and the recent civil unrest may provide further temporary stimulus in the short term, this can hardly be the appropriate springboard for the entire industry's recovery.

Prior to the pandemic, the Government earmarked a 10-year infrastructure investment plan worth R2,3 trillion, with investments planned in the housing, energy, agriculture, transport, water and sanitation, digital and infrastructure sectors. Fortunately, the construction industry will ultimately benefit from the hastened implementation of infrastructure investment in the post-pandemic recovery effort. Many projects will be fast-tracked, with R139 billion already allocated for investment into affordable housing. There have been 276 infrastructure projects presented to investors worldwide, and on 23 June 2020 at the inaugural Sustainable Infrastructure Development Symposium of South Africa, President Cyril Ramaphosa stated a "firm commitment" was received on many projects.

Infrastructure development had fallen sharply before the pandemic, and the short-term boost caused by rebuilding after the civil unrest will not reverse the effects of the last 18 months on the industry, although, there remains hope of a long-term solution with the construction industry earmarked as a high-priority benefactor of South Africa's stimulus plan. The Government's focus on the construction industry is expected to create 1,8 million employment opportunities over the next decade. Both international and local development banks have supported the intended investment in infrastructure. While we await confirmation that the investment will materialise, consideration must be given to the construction industry's challenges and what can be done to avoid past mistakes.

How BIM could revive the industry

From a data management perspective, the construction industry has continued to use a non-computational data approach, with tools such as 2D computer-aided design, which has resulted in, among other things, a lack of effective design management amongst stakeholders, overlapping work streams, and lengthy lead times. Solving the fragmented nature of the construction industry requires a shift towards the adoption of a more computational and collaborative approach that will better prevent duplication, increase efficiency and reduce project costs.

Despite the obstacles faced, innovative technological solutions such as Building Information Modelling (BIM) could assist in reviving the industry to make it more efficient, maximise its limited resources and create an attractive option for future investors. BIM is an IT-enabled approach that involves applying and maintaining an integral digital representation of all

Building Information Modelling: The future is here, and it's #digital *...continued*

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building information for different project phases in a data repository. The data repository is accessible to all construction project stakeholders to ensure BIM uses technology that digitally constructs an accurate virtual model of a building. For example, the model of a building, which will be in 3D, will depict the exact dimensions of the building. With this, each stakeholder can ensure up-to-date imaging of the project as it progresses.

Through its digitalisation BIM can be used in all stages of the project lifecycle, including the actual construction phase, to provide instant feedback and updates on the project. BIM envisions efficient collaboration, improved data integrity, intelligent documentation, distributed access, and retrieval of building data and high-quality project outcomes through enhanced performance analysis.

BIM has been in existence since the 1970s but has only recently seen an increase in uptake in the South African construction industry, primarily in the design phase. It has yet to reach mass adoption across the construction phases. Currently, engineering firms have driven the adoption and implementation of BIM. In this design phase, some benefits allow for co-ordination and clash detection, estimating material prices, construction simulation, and creating shop drawings and review submittals.

However, this has limited benefits as the very purpose of BIM as a collaborative tool requires its involvement in each phase of a construction project. In South Africa, there has not been sufficient effort from the necessary role players to ensure mass adoption.

Regulatory requirements

A more collaborative approach from Government and regulatory and professional bodies requiring the use of innovative solutions such as BIM may hasten its adoption. In Australia, for instance, the adoption of BIM has been made mandatory for any public projects valued over A\$50 million and the UK Government has mandated BIM for all construction projects funded by the central government. The trickledown effects will ensure a more stable environment that will attract investment.

BIM has seen much success in developed countries such as the US where as early as 2007 the use of BIM was adopted for projects valued at US\$8 billion and above. Malaysia, a country which faces similar socio-economic challenges to South Africa, including resource and skill shortages, has supported the incorporation of BIM in government projects, resulting in a higher adoption rate of BIM.

In our view, an acceleration in the adoption and implementation of BIM in South African construction projects would require governmental support and intervention.

COVID-19 has forced us to rethink the way we all work, and studies have shown that nine out of 10 global major projects venture off track, mainly due to budget and time overruns. The overruns and reworks translate to significant financial losses. In Part 2, we will highlight how the use of BIM can be an effective way of ensuring that the activity of all project participants is controlled to mitigate against the financial losses associated with project overruns. We will also address recent case law concerning BIM.

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