The Big Five

Captains of BIM in South Africa

Building Information Modelling (or BIM) has exploded onto the building and construction landscape in recent years. Speak to the experts and BIM gets pretty technical, pretty quickly, but at its core, it is a process of working, aided by software tools, apps and processes that promote collaboration and transparency within the many working parts that make up a construction project.

The national rollout of BIM is spearheaded by the BIM Institute of South Africa, and Concrete Trends spoke to the Top 10 movers and shakers in the BIM-osphere in South Africa.

Vaughan Harris

Executive Director, BIM Institute
Editor, Construction Software and IT Journal
Director, Digital Construction Expo

As the founder and executive director for the BIM Institute it is Harris' vision to drive technological transformation in the industry, and support best practice in line with international BIM framework standards. In establishing the BIM institute, his core focus is to always remain completely neutral and non-biased in delivering the digital construction message.

The institute was created to engage stakeholders in the construction industry in dialogue and provide a platform for companies to engage in partnerships and support initiatives; a place to share and gain knowledge for digital transformation.

With an end goal of setting the BIM ISO standards in the country, the Institute has developed an "Implementation Guide" for BIM rollout in South African businesses. With the hard work and support of the Institute's Steering Committee this guide has gained widespread support nationally, and will form the backbone to the standards long-term.

Harris first immersed himself into BIM in 2010, while working for Construction Computer Software and managed the partnership with UK-based company 4Projects. This was where he saw first-hand the UK visualization around the various BIM level mandates and the processes they used to transform the UK industry.

Harris didn't need much convincing when he was introduced to BIM. With his Quantity Surveying background and in-depth knowledge of construction IT, it seemed a straightforward and logical process - storing information in a 3D model, thus creating a single source of information for the entire team.

Always the showman, Harris compares BIM the 'The Matrix' movie.

"Not everyone can be Neo, but by joining the revolution you believe – and fully understand – that in order to transform we have to join the resistance if we want to better our future. You either see it or you don't!" he proclaims.

"BIM is far more than a technological enabler of transformation, but should be seen as supporting a complete process to manage static and non-static data in design, construction and operational processes. By any definition, BIM is reality; it represents a paradigm shift in how we share and manage information from design through construction to operation."

As a BIM visionary and someone who sees the returns that companies get from BIM across the supply chain, it frustrates Harris that so many organisations – especially contractors – just don't "get it."

"If society can to see the advantages of something as simple as virtual reality, then why can an industry not see the advantages of accessing information in the realm of 4D and 5D?"

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The biggest challenge, according to Harris, is not to understand the advantages of BIM, but to first wrap our heads around 3D structures, before looking at the advantages around time and money in a BIM process.

When asked what the most surprising 'unintended consequence' of BIM is, he points to the structural dominance of asset management organizations and the Department of Public Works in the country.

"If these entities are to transform and become the driver of change, then I believe we should rather be asking the question: 'What are the unexpected consequences of not using BIM?'"

Harris is also the Editor of the Construction IT Journal and Programme Director for the Digital Construction Expo, roles which he embraces as vehicles to reach the widest audience of professionals, software vendors and institutions through events and media.

"Everyone has a role in creating a digital transformation path for the country and continent," he concludes.

Chris Allen

Director of A3D, Lecturer in Department of Construction Management (NMMU), CIOB Africa and CMDC member

Allen brings his knowledge of the early implementation of BIM on four different continents to the institute. He can attest to the fact that the challenges experienced in each of these environments is similar (and deep-seated in technical awareness and culture) – and thereby he has a handle on the skills needed to overcome them in order to make the South African/African BIM experience a successful one.

He was active in the BIM-osphere before the term BIM was even coined (circa 1999.)

"We formed A3D to use the 3D models we were already building for the construction process (to sequence construction activities) rather than just for design."

He was drawn to BIM as a way to make sense of the chaos of delivering projects the traditional way. The collaborative design and build environment he worked in in his early career suggested a better way of working. It was through BIM that he found he could use his tech skills to communicate with all the participants of a project – including the client – and coordinate activities much more efficiently.

BIM is a powerful visual communication tool, enabling project participants, from client to labourer, to see what the team is trying to deliver.

"Their eyes are literally opened to how the project goes together and their role in achieving that, which empowers them to become meaningful participants in the process."

Moreover, with BIM nobody can hide. Although Allen has encountered inidividuals and organisations not up to standard try to derail the process by blaming the technology, he warns that this can damage the team dynamic if not rooted out and addressed early.

Shawn Hopkins

Professional Architect
BIM Curator / Maker

According to Shawn Hopkins, the introduction of virtual building modelling software (or BIM) has offered the architectural profession a powerful set of processes to design, communicate and deliver a real building, with more efficiencies than ever before.

"Through the connected workflows of BIM, the software can offer far more accuracies and efficiencies than traditional workflows," he states.

Fully leveraging the power of BIM software and the associated data, could see design and documentation efficiencies increase between 3 - 5 times to that of tradition 2D CAD workflows.

"It is in this space that many architects are missing a great opportunity to reignite their control on projects. Controlling the virtual modelling gives the profession the opportunity to reposition itself in the project team, and bring architecture back to its once revered status."

Hopkins says he adopted BIM in 2007, but it wasn't until 2013 until he had his "BIM enlightenment."

"There is a massive difference between using a BIM authoring tool, and fully leveraging the power of this tool. The first step to fully leveraging BIM is to understand the concept of being a 'data curator'. The fact that you are creating a virtual replica of the real asset. A concept we refer to as 'Build it virtually, assemble it in reality'."

"The concept of 'connect workflows' was my main motivation for exploring a BIM authoring solution," he explains.

"Having worked in the 2D world of AutoCAD for many years, and then extruding our designs out of the plan in SketchUP (which was an amazing process at the time) I needed my workflow to be more efficient through the plans, elevations and sections being connected to the 3D model. A pet dislike of mine is to re-do stuff. I simply felt that I was making the same decision in 3D, then again in plan / elevation / section / spreadsheet. That workflow was leading to errors, and many late nights."

The two greatest advantages of BIM workflows are the efficiencies and ability to communicate our design responses. The fact that a piece of software (ARCHICAD) could make Hopkins 3 – 5 times more efficient in the delivery of his architecture was a no-brainer.

"Margins nowadays are extremely tight, and if we are not able to accurately facilitate the design, documentation and coordination processes in less time, we are bound to lose work to our architectural competitors who have adopted BIM workflows."

Communication in architecture is everything, according to Hopkins.

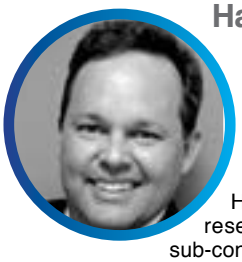
"If you cannot communicate your design response, your client will simply shelve your ideas. BIM allows you to take your conceptual model, use it to communicate, and then shift into your design development and working drawing documentation."

Having fully adopted BIM processes in his office, it is very clear to identify the inefficiencies of outdated 2D workflows when they receive 2D CAD files from their consultants.

Unexpectedly, Hopkins now understands data, and the importance of local product data to his architectural workflow.

"My decision to adopt ARCHICAD in 2007 had nothing to do with how I could efficiently extract data out of my BIM model. To then have all that data connected to the model, means that I can curate the information to ensure accuracies in the information that is leaving our office."

Hopkins and his team are now assisting local manufacturers get their building product data BIM ready, along with connecting that data to geometry inside the leading BIM authoring solutions.



Hans Rossocha

General Manager
Group Five

Hans Rossocha represents contractors and sub-contractors on the BIM Institute's Steering Committee, looking at the practicality of turning the models generated in the design phase into a workable plan on the construction phase.

"We highlight what the contractors need out of the 3D design. I look at that interface from the information that is developed during the design process and then gets used onsite. Are we in fact generating the right information for the right people?" says Rossocha.

Group Five has been using BIM actively for four years now.

"We started off using it mainly for tender proposal work, and then actively in our operational projects for the past three years."

The company was initially drawn to the processes when it saw the results British and US companies were achieving.

"Companies like Watterson, Skanska and Laing O'Rourke were showing huge reductions in the amount of rework they had on sites by using BIM 'Clash Detection' and the BIM digitalisation technologies."

The timing was crucial too as Group Five moves into an engineering, procurement and construction role rather than a pure construction role.

"It's in our interest to make sure that the engineering designs are correct, and have no errors in the contracts that we do."

Rossocha says that the biggest advantage of BIM is the visualization aspect.

"From the finance clerk all the way up to the clients and their representatives, the team is able to envisage – in 3D digital format – what we are going to build."

This information is then attached to the construction programme (that "interface" that is so important to the steering committee) where they can analyse the construction steps – from start to finish.

He says that he has been most surprised to see how people, when given the software tools (Autodesk in their case) – often without much training or documentation on how to use it – interact with the models and intuitively find ways to apply it.

"We had a Quality Engineer working on a major petrochemical project, for instance. He showed us exactly where and how he was going to do different quality checks on the piping using our model. He was never trained on the processes or given any documentation on it, but saw the value of the 3D model and formulated his own way of using it. It happens all the time," he smiles.

He was disconcerted how slow the take-up was for senior management though.

"As they weren't too familiar with using digital technology, they still insisted on having the 2D drawing and would sign off on that. It meant we had to run both systems for a while on a couple of projects. We wanted to apply it completely throughout the project, but there was some reluctance at the start."

Nicholas Karassavas

BIM IPD Development
Revit Specialist
BIM Integration Specialist, ARUP

Nick Karassavas is a BIM stalwart, passionate about filtering out the noise created in the industry on the topic of BIM, and providing practical, unbiased and ethical advice to organisations starting - or at any point of the – BIM journey. This is what he brings to the BIM Institute steering committee.

"There is a lot of information out there, and people come onto committees with an angle, they want to sell their product or services. You have to filter that out and play to the best interest of the company, or the country's rollout. Things can get heated with these vested interests. As an organization we don't have these vested interests and we need to have the voices there to keep it impartial."

Karassavas has been active in the BIM environment for around 14 years, before it was even termed BIM. He recalls the excitement of working with Revit when it was first introduced, even before it was bought out by Autodesk. In fact, he was a part of the team that trained the Autodesk team in the US when they bought the software in 2002.

Hailing from an architectural background, Karassavas says it made absolute sense to digitize and collate all the information from the different disciplines and model everything. That way you can create a virtual building that you can start analysing and gauging the repercussions of what will happen on site – giving you a chance to value engineer all the different disciplines.

"It just makes absolute, perfect sense."

He warns though that the project hinges on the skill and knowledge of the initial draughtsman. He must set up the model carefully and correctly the first time, otherwise the project cannot succeed.

Another non-negotiable when working on a BIM project is ensuring that you have buy in across the board. This means having a detailed digital brief and documentation describing exactly what is expected from every member of the team, at every stage of the project.

"It's almost essential that you pre-discuss what's going to happen, who's going to produce what and how."

Another thing to keep in mind is your practical needs for the project; training, software and hardware solutions.

"You can't just use anything, you need to investigate what software and hardware you need before purchasing anything. It must conform to the size of the models and projects that you will be working on," he warns.

And lastly, he points to the need to have someone whose job it is to tie it all in. Not just the modelling aspects, but the documentation as well.

"It is vital that you have someone to navigate the project manager and the key people on the project, to ensure that they follow certain standards and protocols."

He reminds us to slow down and ensure we are moving in the right direction.

"People talk about level 2 and level 3, but you have to bring them back and remind them to first get to level one."

Importantly, Karassavas says that BIM keeps the project on the straight and narrow, forcing the team to follow best practice.

"If we train ourselves up to understand the fundamentals of the software you're using, how we share the data, how we do these execution plans and what they mean, then it's not going to take 6 – 12 months before we know what we're talking about," he concludes.