



## INDUSTRY EXPERTS ADDRESS TECHNOLOGY DEVELOPMENTS IN SA

Sharif Omarshah, an associate at GAPP Architects & Urban Designers (Pty) Ltd, and Francois Mercer, an architect at Paragon, share their insights on technology and its ongoing development within the industry.



Sharif Omarshah  
an associate at GAPP Architects  
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Francois Mercer,  
an architect at Paragon

### 1. WHAT IS THE ROLE OF TECHNOLOGY IN ARCHITECTURE?

#### SHARIF OMARSHAH (SO)

Modern architectural practice has changed with the advancements in technology – not just with resolving complex geometry and form by 3D modelling, but also in terms of the following:

- Generative design.

- Building information modelling and coordination between disciplines.
- Generation of built information with regards to existing buildings.
- 3D printing, etc.

#### FRANCOIS MERCER (FM)

The role is like that of a pencil – a tool used as an augmented extension of the mind to communicate, explore and realise ideas. Technology is the current

progressive tool pushing our minds to think differently, all while building on previous and present skills.

With regards to the impact of technology on materials, it should be noted that the development of plasticizers and shuttering in concrete allows us to generate the shapes required for parametric modelling, or the development of technology in glass: coatings, printing, double glazing and energy generation.

## 2. IN TERMS OF TECHNOLOGY, ARE ARCHITECTS IN SOUTH AFRICA BEING LEFT BEHIND? IF SO, WHAT WOULD YOUR SOLUTION BE?

### (SO)

To a large extent, yes. Architects in South Africa are not using the latest advancements in technology for the profession, however, this has to be understood from the perspective that the latest trends deal with the industry as a whole and much of the technology is best used when all stakeholders use the technology, i.e. professional consultants as well as contractors and facility/asset managers. There is, however, technology particular to professional consultants in terms of software and hardware. From the various built environment disciplines, architects are ahead of their engineering and quantity surveying colleagues in terms of usage in South Africa.

### (FM)

Architects in South Africa are mostly playing catch-up to learn and implement. The technology becoming available for the industry can make architects and the industry more efficient. But the financial challenges in our economy and the limitation of what can be manufactured, limit the exploration and integration of the latest into the practice.

Implementation only occurs once the technology has become a standard to communicate between the various disciplines. A possible solution is to capitalise on integrating the learning institutes and the industry through an exchange of knowledge. The majority

of students are armed with the knowledge and skills of 3D printers, virtual reality and parametric modelling. The industry has the practical experience of realising projects from inception to construction. There needs to be a collaboration of theory and practice – a common space where architects and students have access to both worlds.

## 3. WHAT TYPES OF TECHNOLOGIES ARE AVAILABLE TO ARCHITECTS?

### (SO)

In terms of software, you have building information modelling software and generative design software, as well as software used for the sourcing of spatial information. There is a myriad of these products available from those developed by Autodesk (Dynamo, Form It, Revit, 3Ds Max, Recap) to other products such as Rhino, ArchiCAD, Microstation etc, which are not under Autodesk. You also have Internet-based tools for access to project data, coordination, etc.

With regards to hardware, you have drones and laser cameras for physical capture before, during or after construction. Other options include digital art tablets from the likes of Wacom etc, 3D printers and the use of tablets together with BIM software and Internet access for on-site, real-time construction coordination, progress and quality monitoring.

### (FM)

3D printing, virtual reality and parametric modelling are the progressive technologies aggressively being explored internationally, while locally only the minority of educational institutes can afford to do so. The local industry has been limited to skills and software. The last five years have shown that BIM (Building Information Modelling) has increasingly been accepted as a common standard of communication between professionals.

## 4. WHAT NEW TECHNOLOGIES CAN THE INDUSTRY LOOK FORWARD TO?

### (SO)

The most disruptive new technologies at the moment deal with generative design – the use of software to actually aid the design process by assisting the designer in developing countless design options based on a set of base parameters. This technology has been extremely successful in the manufacturing industry and is now making inroads in the construction industry. In addition to this, there is also the Internet of Things and the impact that this will have on architecture, from the way the future home will function to the way future cities will function.

### (FM)

The industry can look forward to the current progressive technologies

*There will be an explosion of innovation that will impact every South African.*

becoming a common standard – from professionals to manufacturers and individuals. As progressive technology becomes a standard, it allows every individual access and the ability to generate skills. There will be an explosion of innovation that will impact every South African.

**5. THERE ARE SEVERAL TECHNOLOGIES IN THE ARCHITECTURE SPACE. HOW DO YOU KNOW WHICH ONE IS IDEAL FOR YOUR COMPANY AND WHY?**

**(SO)**

In practice each stage of an architectural project will have different technologies that best suit that particular stage of the project's lifecycle – from digital art tablets, 3D printers and intuitive 3D software programmes at the early design stages to the analysis type tools at the design finalisation stage, and the construction and occupation stage software and hardware tools.

**(FM)**

Since Paragon began, the company has continually aspired to pursue innovation as each project comes with its own challenges. Sparking the exploration, testing and implementation of technology facilitates solutions and often a unique thought process. At the heart of the company is each person's willingness to learn and

push themselves, as each project's complexity progressed further than the one before.

**6. THESE TECHNOLOGIES ARE OFTEN EMBRACED BY MUCH LARGER COMPANIES AND ORGANISATIONS. HOW CAN SMALLER FIRMS COME ONBOARD WITHOUT LAGGING BEHIND?**

**(SO)**

The biggest issue with smaller firms is understanding the importance of technology and providing an adequate budget for technology, be it software, hardware or research and development.

**(FM)**

Larger companies and organisations by nature have larger revenues and often search for efficient technologies to make their workflow profitable. Smaller firms are lagging behind as the technologies are financially out of reach.

**7. WHAT PROCESS IS FOLLOWED WHEN MAKING USE OF TECHNOLOGY TO SOLVE AN ARCHITECTURAL CHALLENGE OR PROBLEM?**

**(SO)**

When architects are faced with a challenge, the starting point is usually

a pen and paper. This then sets the stage for the use of 3D software and/or 3D printing/modelmaking etc.

This starting point will change as we see digital art platforms (stylus pens, graphics tablets, etc.) becoming more suited to technical use and interface with 3D technical type software.

**(FM)**

Each software programme can achieve the same outcome, but with varying methods and time. Certain technologies become favourable as they offer to solve complex challenges while streamlining workflow. In special challenges there are cross-communication between software programmes, as certain software also becomes limiting.

**8. TECHNOLOGY IN THIS INDUSTRY ADDRESSES NUMEROUS TOPICS SUCH AS VIRTUAL REALITY TYPES. ARE THESE REALLY NECESSARY OR JUST A NICE-TO-HAVE?**

**(SO)**

Virtual reality for now is a nice-to-have, but many of modern societies' necessities were once a nice-to-have.

**(FM)**

Virtual reality is one of the current progressive technologies which is the core theme in most sci-fi films. It has inspired multiple possibilities of the future. In some sense there is no escaping from it, we need to move with it. The technology has become another tool in our toolbox in our design process, presentations and during the construction phase.

*When architects are faced with a challenge, the starting point is usually a pen and paper.*

## WR ARCHITECTURAL TECHNOLOGY

### 9. HOW CAN TECHNOLOGY TRANSFORM THE CONSTRUCTION INDUSTRY?

#### (SO)

The most important way technology is transforming the industry is by its quick progression to a more standardised construction methodology, where many of the buildings we use will be prefabricated in a warehouse and then lifted into place on site. This will have a major impact in South Africa and other similar nations where the emphasis is still on labour-intensive forms of construction.

#### (FM)

Technology is one key to aiding the construction industry to increase its sustainability. BIM is being used to analyse buildings' performances before and after being built. Through 3D modelling and accuracy of information between consultants, contractors are aiding in the communication and speed of construction.

### 10. WHAT SHOULD ARCHITECTS' AND SPECIFIERS' APPROACH BE WHEN IT COMES TO UTILISING TECHNOLOGY TO IMPLEMENT THEIR STRATEGIES?

#### (SO)

Take each type of technology and use it on its merit, without over-emphasising one product and forcing it to function throughout the lifecycle of a particular project. Also understand that it is time architects become adept at computer programming, as this is the language of the future.

*Through 3D modeling and accuracy of information between consultants, contractors are aiding in the communication and speed of construction.*

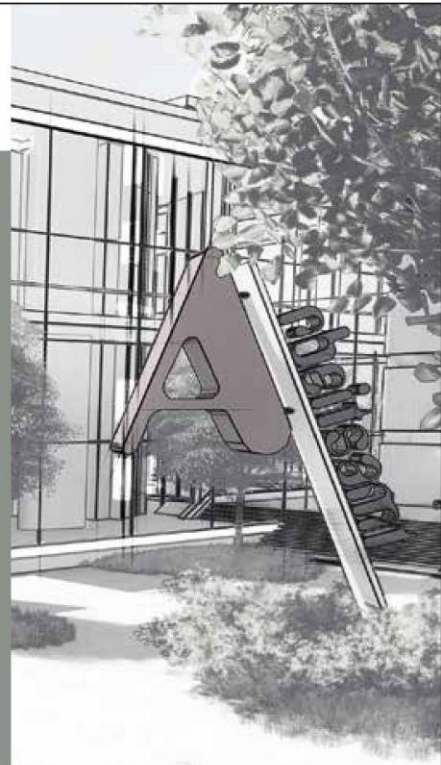
#### (FM)

Technology is a means; it is not the end. The direction of technology is leading to an immerse experience by using these technologies to facilitate and communicate your ideas further. We continually must learn and build on previous skills as we go forward.

### 11. WHAT TECHNOLOGICAL CHALLENGES DOES SOUTH AFRICA FACE AND HOW CAN THESE BE OVERCOME?

#### (SO)

The challenge is balancing the huge need for semi-skilled/unskilled employment with the rapid advancements



in technology that is changing and making obsolete many aspects of the traditional job market in the construction industry.

#### (FM)

The challenges that South Africa faces, are the accessibility and cost of technologies. Technologies usually are introduced at the top and trickle their way down, but this takes time. An alternative solution is an open-source network to allow access to programmes at no cost in order to facilitate individuals and companies to upskill themselves and become proficient.

South Africa is certainly on par as far as technology goes and where they are lagging, they are steadily moving forward to achieve the same standards as their international counterparts.

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