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Future Economy Council built environment subcommittee co-chairs Lim Ming Yan (far left) and Desmond Lee; and TwinRock Global CEO Raj Joshua Thomas (below).

PHOTOS: JASON QUAH, KELVIN CHNG

BUILT ENVIRONMENT

Building a shared future

From construction and real estate to environmental services and security, the aim is for industries in this sector to “come together” and integrate both vertically and horizontally. **BY JANICE HENG**

TRANSFORMING the built environment sector isn't just about construction robots or prefab walls. It starts with early design efforts, and continues after a building is completed. This holistic view is clear in the industries overseen by the Future Economy Council's built environment subcommittee: not just construction and real estate, but also environmental services and security.

The aim is for industries to “come together”, says subcommittee co-chair Desmond Lee, Minister for Social and Family Development and Second Minister for National Development. This means vertical integration: bringing together all players involved in a project's design and construction. It means horizontal integration across time and value chains. And it means tackling post-completion considerations from the start: “How do you design and construct a building that's easy to maintain?”

This is in line with sustainability, says fellow co-chair Lim Ming Yan, former president and group chief executive officer of CapitalLand. Green buildings must be both designed and managed in an eco-friendly way.

The integrated approach also improves sustainability by allowing for more efficient construction, adds Mr Lee. By getting all stakeholders involved from the start, design clashes and abortive work can be avoided, saving time, money, and resources.

Right from the start
This approach is exemplified by Integrated Digital Delivery (IDD), in which tech connects a project's work processes from start to end, linking all stakeholders. Four areas go digital: design; fabrication; construction; and asset delivery and management.

Beyond tech, IDD requires a departure from convention. “For IDD to work, your whole way of design coordination, your documentation, your procurement has to change,” says Ashvinkumar Kantilal, group chief executive officer of ONG&ONG, which offers design, engineering, and project management solutions.

Traditionally, a project proceeds in incremental stages: the architect comes up with a design, the engineers give their input, and so on, until the project goes out for tender and contractors are appointed. “But IDD requires everybody to come on board from Day One,” says Mr Ashvin.

ONG&ONG is handling Sloane Residences, one of Singapore's first 12 IDD demonstration projects. All parties share data on a single platform, letting them monitor the use of resources such as concrete and steel, and track progress in real time. “The contractor, looking at the model, can immediately quantify and ascribe a cost,” says Mr Ashvin. “The same platform will allow me to track the progress of works at site.”

Paving the way for IDD was Building Information Modelling (BIM): digital models incorporating detailed data. The Building and Construction Authority (BCA) has been encouraging BIM adoption for years. In 2015, BIM submissions became mandatory to get regulatory approval for projects with a gross floor area of more than 5,000 square metres.

ONG&ONG began BIM adoption in 2012. Says Mr Ashvin: “It's not a software but a way of doing things.” It is about bringing together all data in one model: architectural, structural, mechanical and electrical systems, down to landscaping and lighting.

“For that to happen successfully, the architect cannot be the only person to do BIM. The whole project team needs to embrace the mindset,” he adds. So although it was not mandatory for engineering submissions to use BIM, ONG&ONG decided to have their engineers use it too.

The point applies to transformation more broadly: it is not just about technology, but mindsets and processes. Says ONG&ONG group chairman Ong Tze Boon: “It will be a shame

at the leadership, strategic level if we think it's about computers.”

Behind the firm's adoption of tech is its goal of mobility, he says. One can no longer tell clients to wait while heading back to a desk: “The expectation of response is becoming five minutes.” Digital tech enables this.

The firm used to have servers on site. It moved to a cloud solution for BIM in 2018, allowing it to collaborate easily with users outside the organisation. “Users also can access their project anytime, anywhere, even using their mobile phone,” says director of design technology Daniels Chandra.

In 2019, they went further. Before, high-spec computers were needed for BIM. With virtual desktop infrastructure, even a tablet can be used, as the software runs remotely. This allows ONG&ONG to reduce investment in computers, says Mr Ong. Anyone can access BIM models without heavy hardware: “That's a gamechanger.”

Securing the future

Digital mobility is changing the game in traditionally labour-intensive areas too. Manpower is another aspect of

sustainability – business sustainability, that is, says Mr Lim.

Even before taking over as chief executive officer of TwinRock Global in 2015, Raj Joshua Thomas had seen the experiences of its founder – his father – in the security industry: “I knew about the issues that he faced.” Chief of these was a lack of labour.

One move that helped was the industry's adoption of the tripartite progressive wage model in 2016. As one of the first firms to implement this, TwinRock was better able to attract security officers. But then came the problem of contract prices lagging wage increases, making it harder for the firm to compete.

It thus made technology its selling point. In 2016, TwinRock had the beginnings of its own security management system, THOR, which has developed further since. Other players have even expressed interest in buying it: “The unique point is that it is developed by a security company.”

One of the biggest issues is “how to ensure command and control from HQ to all of your sites”. TwinRock's officers have tablets loaded with THOR, which guides them through their shift and keeps headquarters updated.

Eventually, THOR will be used for planning deployment, and integrated with payroll. All this is a far cry from the manpower-heavy, paperwork-reliant days when TwinRock used to plan deployment on a whiteboard in HQ.

“When we first implemented this, we had quite a bit of problems,” admits Mr Thomas. Security officers were resistant to change. But over time, they saw how the system could help, even outside shifts – booking leave via THOR is easier, for instance.

TwinRock is also exploring video analytics to replace humans in routine work such as perimeter protection and patrolling, as well as drones. Given the labour crunch, the shift towards tech needs to take place across the industry, says Mr Thomas, who is also president of the Security Association of Singapore (SAS).

Granted, it can be “painful to create a whole new division” to focus on technology. But there is no choice: “For traditional manpower companies, I think it is going to be very difficult to continue to compete.”

The SAS has held matchmaking sessions with technology firms. Government aid is available, from financial support to training courses to equip officers with digital skills.

Across the built environment cluster, technology is helping to create higher-skilled jobs, says Mr Lee, pointing to the Integrated Construction Prefabrication Hubs where Singapore workers handle BIM models. “These are jobs that come about because of transformation.” Players in landscaping, cleaning, and security are also coming together to see how jobs can be redesigned and combined to form higher-paying roles.



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Come together

While competition is often cited as a key challenge, the way forward is via collaboration, say the co-chairs.

In landscaping, firms are exploring common standards and procurement processes. If firms buy very different equipment, say, maintenance may be an issue – thus the idea of having common evaluation criteria so all players can adopt similar equipment.

In real estate, the Singapore Estate Agents Association (SEAA) launched a mobile app in June 2019, together with three property agencies. The RealAgent app provides real-time transaction data so agents can give their clients up-to-date information about a property's value and trends.

The collaboration was easy in the sense that all parties had a shared goal, but initially hard as the association had to balance the needs of the three agencies, said SEAA president Thomas Tan. “But eventually they appreciated SEAA's overarching mission to work in the interest of our agents.”

The impetus for the app was that “consumers are now more tech-savvy and knowledgeable, and have higher

expectations of property agents serving their real estate needs”.

Client demands drive innovation elsewhere too. ONG&ONG uses augmented reality and virtual reality (VR) for an immersive experience of future projects. Using VR, clients can see exactly what proposed changes – a different floor height, say – would look like. “It helps, rather than doing drawings after drawings, and then they still cannot decide,” says Mr Ashvin.

In other aspects, admittedly, some clients may not be ready. Not all of ONG&ONG's regional clients are prepared for the costs associated with BIM, which needs more man-hours due to the level of detail. But Mr Ong believes it is just a matter of time until they recognise BIM's advantages: “It's a good seeding for tomorrow.”

First-movers cannot be too far ahead, says Mr Ong. Using BIM is not an advantage if the client cannot view the model, or the contractor cannot build from it. But by being a couple of steps ahead, one can pull the market along – as long as one is headed in the right direction. “If you can anticipate that right, then your two steps forward will be visionary.”

“A lot of all this change may not have happened without the government taking a position,” he adds. Government support makes it easier for progressive firms to adopt tech early instead of waiting until clients are willing to pay for these advances.

As role models proliferate, even the more reluctant firms will get on board, believes Mr Ong. “When the path has been laid out for you... I think people will follow.”

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From left: ONG&ONG group CEO Ashvinkumar Kantilal, group chairman Ong Tze Boon and director of design technology Daniels Chandra.
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