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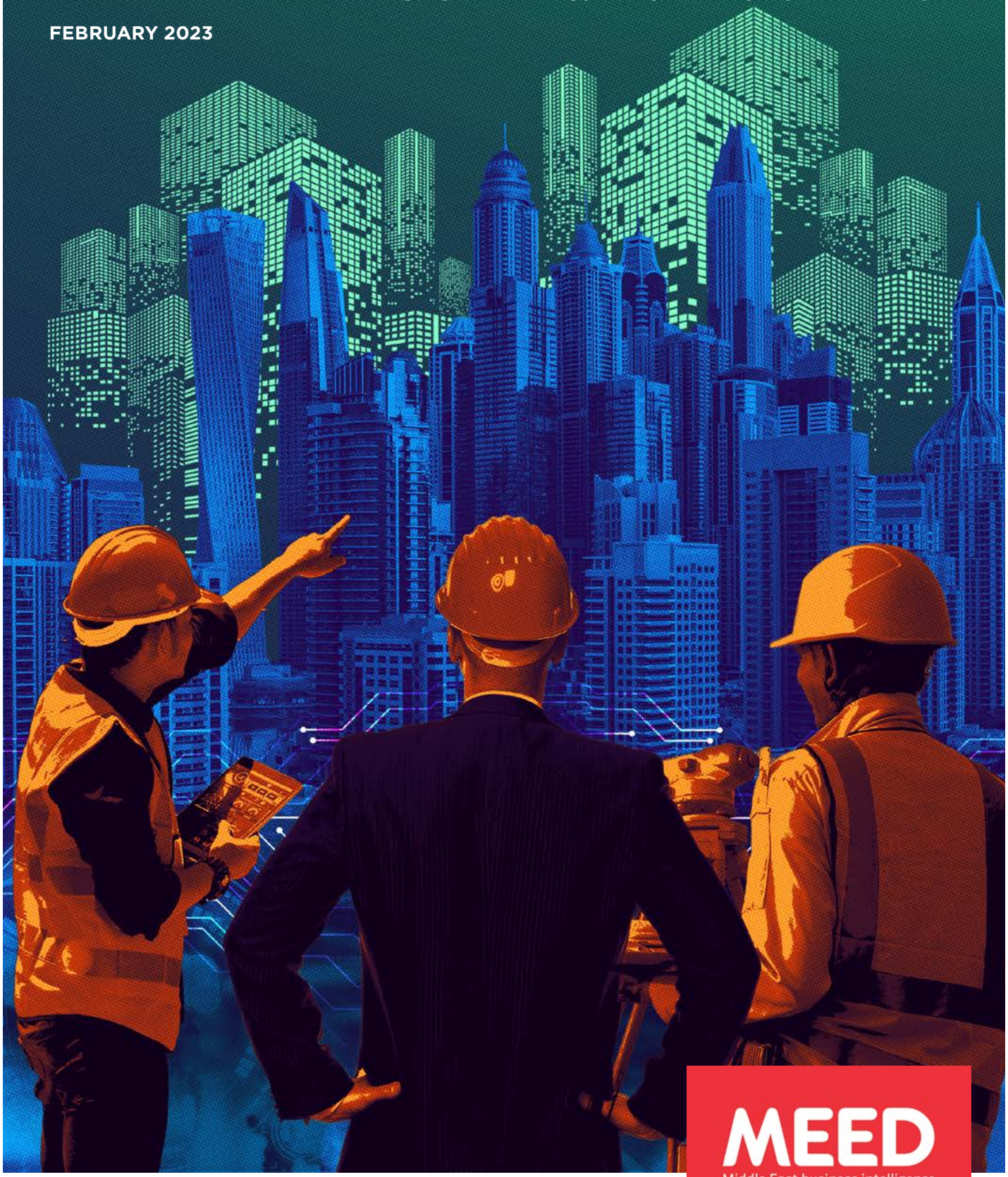
How the Middle East is leveraging technology to optimise project delivery

FEBRUARY 2023



MEED
Middle East business intelligence

"Industry stakeholders must therefore position themselves and leverage technologies to increase productivity and collaboration while ensuring visibility and transparency throughout the project cycle"

- Ed James, MEED

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DIGITAL OPPORTUNITY

Few can deny that the GCC construction industry has experienced some major challenges in recent years. Falling oil revenues and the subsequent decline in government spending saw annual construction and transport contract awards decline from a high of $107bn in 2014 to just $40.6bn in 2021, according to data from MEED Projects (see Figure 1). Struggling to adapt, many firms were forced to scale down their operations just to survive.

The mood however is changing. On the heels of the post-pandemic demand boom and sharp rise in oil and gas prices, the region is experiencing a reversal in its project market fortunes. In 2021, total contract awards across all sectors increased by 38 per cent year-on-year to $116bn, the highest level in five years. Now, with capital expenditure initiatives such as the Saudi Arabia giga projects programme well under way, the market is arguably more bullish today than it has been at any point over the last half-decade.

This optimism is supported by the ever-growing pipeline of projects. There are just under $2.1tn worth of planned and un-awarded projects in the GCC, MEED Projects data shows (see Figure 2).

Indeed, such is the size of the project pipeline that the market may soon find itself struggling to meet the anticipated workload. MEED estimates that the Saudi giga projects programme alone requires more than $300bn worth of construction work to be awarded by 2025.

Faced with such a significant potential ramp up in activity, it is more pressing than ever for companies to focus on delivering their developments as efficiently and sustainably as possible.

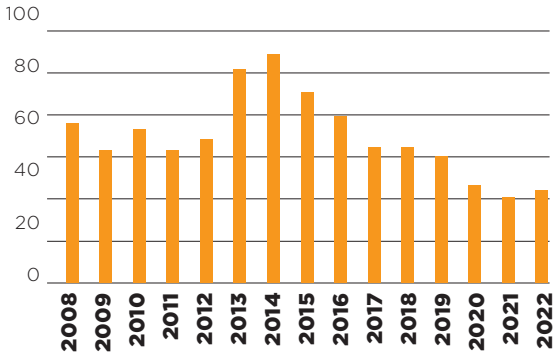
This will only be achieved with the use of technologies and software platforms that can transform the way projects are implemented from the drawing stage to handover.

Recent initiatives reflect this. Aware of the current and future project delivery challenges, the GCC states have designed forward-looking strategies that identify digital transformation and sustainable construction as key enablers of economic development. Strategies such as the Dubai 2040 Urban Master Plan, Tasmu Qatar and the Saudi Vision 2030 highlight their intent to become construction innovators.

Industry stakeholders must therefore position themselves and leverage technologies to increase productivity and collaboration while ensuring visibility and transparency throughout the project cycle.

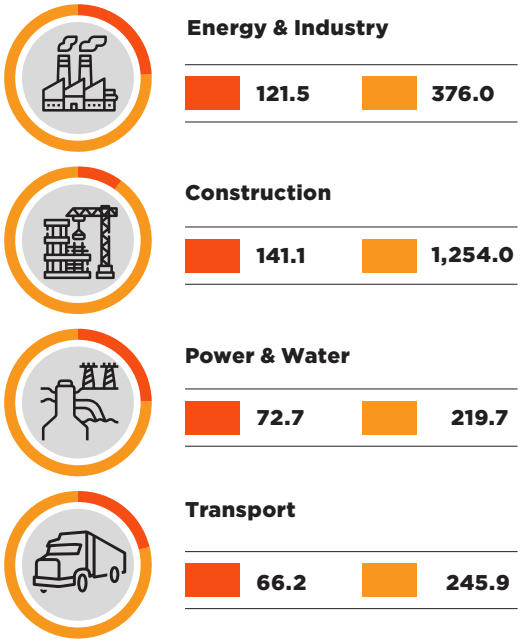
With efficiency and sustainability a core requirement of almost all new development, the adoption of construction technology is something that no company can ignore.

FIGURE 1: GCC CONSTRUCTION AND TRANSPORT AWARDS 2008 -2022* ($bn)



Data as of November 2022
Source: MEED Projects, GlobalData

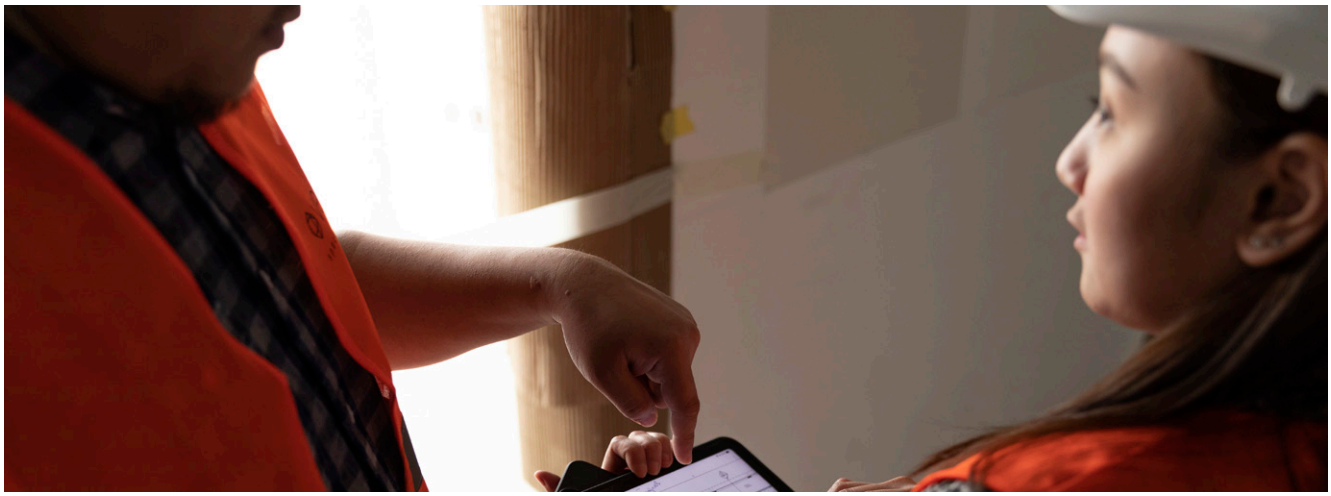
FIGURE 2: VALUE OF ACTIVE GCC PROJECTS BY SECTOR ($bn)



Projects data as of November 2022; Construction includes all buildings such as hospitals, malls, hotels, towers, villas and schools; Transport includes roads, airports, ports and railways.
Source: MEED Projects, GlobalData

A NEW DATA ECONOMY

Using a unified platform to consolidate and share data will unlock benefits for the sector



The global construction sector in general and the GCC market in particular have been latecomers to the world's digital transformation - frequently referred to as the fourth industrial revolution.

Despite the undeniable benefits of digitally-enabled smart construction tools such as digital twins (for more see Table 1 on page 6) in unlocking savings in cost, time and materials, and in improving the quality and performance of the built environment, the sector has been traditionally reluctant to invest in technology. However, this is changing.

A 2021 report by US consultant McKinsey highlighted that global technology investments in construction have doubled over the past decade to $25bn. In the Middle East, government leaders have recognised and acted on the potential for technology and integrated platforms to streamline processes and advance profitability.

The UAE's Digital Economy Strategy is a case in point. Launched in April 2022, it aims to double the contribution of the digital economy to the country's GDP to 19.4 per cent within the next decade.

This offers a clear incentive for the construction industry to accelerate technology adoption and improve the efficiency and sustainability of construction management and site operations. However, implementation of digital technology solutions on a project will itself not be sufficient to derive actionable insights from project data and to maximise efficiency.

Moreover, the amount of data generated on projects can be bewildering given the many different sources and elements of the construction process.

Although investment in cutting-edge construction technology can assist business owners in facilitating digital transformations, employing too many diverse and incompatible software solutions runs the risk of making the stream of data unintelligible.

For instance, a company that has siloed data from a range of digital tools, such as visualisation and automation technologies, collaboration programmes and digital twins, may overlook a key piece of information that could negatively impact

95%

SHARE OF DATA CAPTURED THAT GOES GOES UNUSED IN THE CONSTRUCTION AND ENGINEERING INDUSTRY

~ FMI Corporation

its project. Worse, such a scenario may well defeat the purpose of adopting the technology in the first place.

CENTRALISED VIEW

Over recent years, industry experts have signalled that the performance of the construction industry can be significantly improved with the availability of data in a centralised location, giving all stakeholders the necessary visibility into the project. Learning from their experiences, there is a growing understanding at the C-suite and boardroom level, as well as from within project teams, that technology adoption needs to be properly thought through.

The industry recognises more than ever that correctly integrated digital technologies can enable better collaboration, greater control of the value chain and a shift towards more data-driven processes. Similarly, the application of analytics can lead to more sophisticated forecasts, increased business agility and better decision-making for all stakeholders.

"Continued maturity and the rapid implementation of data strategies are paving the way for an era of predictive insights," says Ben Jackson, head of project and development services Middle East and Africa at property consultancy JLL.

Jackson says that data will be central to improving and optimising project delivery as the construction and real estate market enters the next phase of technology adoption. "Integrating data from various design, construction and operations technology into unified data lakes and data warehouses, and the rise of full life-cycle data management, are the next phases for the use of data in construction," he adds.

Even then, having fully integrated data may not be enough. According to a 2022 report by US consultant FMI Corporation, 95 per cent of all data captured in the construction and engineering industry goes unused. In many cases, crucial data is not produced in a standardised digital format, and data sharing does not happen across the industry in a meaningful way.

Construction companies can become more efficient and competitive by having one set of consistent operating procedures that are facilitated by technology. Standardised processes that are repeatable and produce measurable results optimise business performance. This makes it critical for construction companies to invest in technologies that make project standardisation easy.

By doing so, collection and analysis of data will streamline processes and allow teams to gather accurate data on an individual and cross-portfolio level to improve productivity and enable timely delivery with minimum wastage.

ADDED VALUE

Project clients see the benefit from their contractors employing technology to avoid time and budget issues, and ultimately improve the end value of their projects.

"The impact of poor cost control can be huge," says Farhad Azizi, CEO of Dubai-based real estate developer Azizi

$9.6bn

TOTAL SPENDING ON INTERNET OF THINGS (IoT) IN CONSTRUCTION BY 2025, UP FROM $4.4bn IN 2019

~ MEED/GlobalData

J One tower is a residential twin tower on the canal side of Burj Khalifa in Dubai, UAE

Source: rkmdubai

TABLE 1: DIGITAL TOOLS IN CONSTRUCTION

VISUALISATION

Using graphics to change the way we see work

- Augmented reality
- Virtual reality
- Digital twins
- Data visualisation

AUTOMATION

Using machines to complement human labour

- Industrial robots
- Autonomous vehicles
- 3D printing
- Robotic process automation
- Drones

INTERPRETATION

Using AI to improve decision-making

- Machine learning
- Computer vision
- Context-aware computing
- Data science

COLLABORATION

Using technology to enable teamwork

- Collaboration tools
- Customer relationship management

CONNECTIVITY

Using networked devices to improve communication

- Industrial internet
- 5G
- Wearable tech

Source: MEED/GlobalData

Developments. "The added value of maintaining the quality of construction far outweighs the additional costs of delivery and is the best way to reduce costs."

"Investors and end-users understand and appreciate quality construction in the form of, for example, sustainability; longevity; high-grade materials being used; the latest, cutting-edge technology being integrated; and renowned designers and architects working on the project. So not only does it help in marketing and selling properties, but it also leads to happier buyers. This, in turn, leads to more sales through repeat purchases and word-of-mouth," says Azizi.

Chris Seymour, director of strategy and investment Middle East, Africa and South Asia at UK-based engineering consultancy Mott MacDonald, expresses a similar view, arguing that many issues can be averted with the proper adoption of technology.

"Poor quality control (QC) should be a reducing problem," he says. "Design quality improves through the use of digital tools and as onsite digital surveillance and inspections are implemented. Incidences of poor QC will still occur, and when they do, many aspects are impacted including user experience, revenue generation, safety and rectification costs."

Seymour adds that construction professionals should also consider the increased carbon generated due to the added work poor QC entails and make every effort to get it right the first time.

WHOLE LIFE CYCLE

Smart construction benefits go beyond productivity gains and cost control. A building owner can benefit from improvement in the quality of design, safer site work/maintenance and optimised life-cycle costs.

Meanwhile, connected construction tools can provide a better understanding of how much each job costs, which then leads to better estimates.

But it is ultimately the ability to combine and share data throughout the life cycle of a building, from design to operation, that makes the most compelling case.

In Seymour's view smart construction requires project stakeholders to make full use of digital technologies not just in the design stage, but also in the manufacturing of materials, site operations and post-completion asset management.

"Too often we see the term [smart construction] being used inappropriately," says Seymour, "particularly when the commitment of the team is up to project completion only."

It is therefore critical to use digital solutions throughout the life of the asset as large-scale digitalisation endeavours require careful consideration.

By aligning construction teams and estimators with cloud-based management, it is possible to reduce oversights and improve project outcomes.

However, it again goes back to the fact that technology solutions cannot on their own deliver benefits unless construction firms have clear visibility on all the required information in a unified location throughout the project life cycle.

BUILDING SKILLS

Being an employer of choice should be a primary goal for construction companies facing an acute skills shortage

With a reputation for being a challenging and inflexible industry mired by old-fashioned attitudes and a lack of diversity, construction has struggled to attract young talent, particularly women. This has frequently made the recruitment, training and retention of new staff a top priority for construction companies.

Clearly, having the right leadership is critical to the development and retention of talent. Senior leaders have the responsibility to lead the professional advancement of the employee through structured coaching and mentoring, specialised training for individual growth and career path planning. They are also instrumental in developing the right strategies for high-performing staff and to help attract, engage and retain talent.

Failure to develop and implement employee-focused programmes potentially leads to the loss of talent and damage to the company's competitiveness in the industry. Ultimately, the bottom line is impacted.

Forward-looking leaders and organisations that have a transformational mindset and a long-term business outlook can therefore improve workplace culture and build a more cohesive and engaged team. For this to happen, it is imperative that industry leaders identify the talent that exists in the organisation and create the right initiatives to upskill them.

A 2022 World Economic Forum survey showed that learning and career development are among the most important considerations when young professionals choose a job. Worryingly, only 48 per cent of respondents said the construction industry fulfils these expectations, according to the survey.

In high demand, today's new generation of skilled workers has specific expectations from their employers.

"The world has changed dramatically over the past two years regarding employment and retention," says Ian Giulianotti, executive director of recruitment at UAE recruitment and training consultancy Nadia Global. "Companies are now having to make a radical shift in human resources (HR) strategies as employee expectations become much more demanding in terms of not only upskilling and training, but also work conditions, such as normalising remote work."

GENERATIONAL SHIFT

The industry is changing as a younger workforce takes up roles, with typically a different approach to technology. Each of them brings valuable characteristics to the industry, and it is essential to acknowledge that each generation is influenced by different circumstances, attitudes and values that in turn impact their skill sets, argues Guilianotti.

"For example, the traditionalists have excellent work ethics, millennials tend to excel with technology, baby boomers are confident and independent, and generation Z are unorthodox thinkers. Blending these character traits contributes to the overall team effort in a manner not previously seen within the industry," says Giulianotti. But this may be more applicable to managerial roles with larger client and contractor firms, which have the autonomy to be more authentic at work.

The traditional methods of talent development clearly need an overhaul. This will begin with utilising the wealth of experience that will be lost when the older generation retires, while also accepting the value that the younger generation can bring as a demographic group

33%

PROPORTION OF CURRENT STAFF OF SURVEYED TRADE CONTRACTORS THAT ARE PLANNING TO RETIRE IN THE NEXT FIVE YEARS

- Procore Global Dodge report

widely expected to be comfortable with adopting new technologies. Combined, they translate into a reverse mentoring skill development strategy, a process for creating a multi-generation workplace where senior leaders and the junior or younger staff can gain new perspectives by mentoring each other.

This practice encourages knowledge sharing and allows organisations to take full advantage of their talent pool across different generations.

ATTRACTING TALENT

The global push to achieve net-zero carbon emissions also puts pressure on construction to operate sustainably and produce greener structures. The shift towards 'greening' construction will inevitably change the skills required.

The pandemic and recent climatic events have focused attention on health and the environment. A company with strong environmental, social and governance (ESG) credentials is important to younger jobseekers, who are often keen to contribute to global wellbeing.

"With the availability of information online on companies and their employment values, more emphasis is required on their brand image and employer branding to attract the best talent," says Giulianotti.

Nadia Global identifies four key skill sets crucial for green occupations: engineering and technical skills, science skills, operational and resource management skills and monitoring skills.

"In the past five years, we have witnessed a 237 per cent increase in renewable and environmental jobs. In stark contrast, there was only a 19 per cent increase in oil and gas jobs during the same period, while the data shows that green talent has been growing at a rate of 11.3 per cent annually in the automotive industry, exhibiting one of the highest growth rates among all manufacturing industries."

The demand for a green economy will stimulate a structural change in the job market through the emergence of new occupations or by 'greening' existing jobs.

"The corporate production and operation processes will have to be more sustainable, and current positions will include environmental responsibilities, requiring retraining of staff," he adds.

> **"In the last five years, there has been a 237% rise in renewable and environmental jobs"**
>
> ***-Ian Giulianotti, Nadia Global***

While this makes staff development and upskilling more important than ever, it also highlights the need for companies to take action to attract the younger generations that are evaluating the credentials of prospective employers more closely.

PARTNER PROGRAMMES

Construction technology training may well be a blind spot for some companies. Older employees can often be late and incomplete adopters of technology, and thus not necessarily able to inform all aspects of the firm's digital platforms to younger hires, who may well be more technologically proficient but not necessarily exposed previously to construction software.

In such scenarios companies can explore and take advantage of external programmes offered by technology partners to optimise the career development prospects of their staff. Several software vendors now offer free professional certifications and online training courses. Such programmes can help validate and advance an individual's knowledge and expertise, provide continuous improvement and pave the way for career development.

To avoid any complacency, the industry should always ensure staff, especially recent hires, are adequately trained and incentivised to take advantage of the various tools at their disposal.

If not, the risk is that the technology is blamed for issues that arise from a lack of user training rather than any inherent problem with the software or platform. This in turn can devalue the technology in the eyes of the company and result in it becoming under-used and lead to unnecessary construction challenges down the line. Having invested in technology, firms must ensure that it is used to its full potential.

GREEN PRACTICES

How digital technologies and advanced materials play a critical role in delivering resource-efficient projects

Masdar City is a pioneer in sustainability and a hub for research and development, spearheading the innovations to realise greener, more sustainable urban living

According to its September 2022 tracking report, the International Energy Agency (IEA) estimates that about 6 per cent of global energy-related and process-related carbon dioxide emissions are directly related to the manufacture of cement, steel and aluminium used in construction. This figure is even higher if indirect emissions are taken into account such as the generation of electricity and heat used in buildings.

The IEA calculates that in order to meet the Net Zero Emissions by 2050 Scenario, carbon emissions from buildings, construction and operations will need to halve by 2030. Given the scale of the $2tn-plus of regional projects in the pipeline, there is no better time than now for construction companies to adopt new technologies and sustainable practices to deliver resource-efficient projects that use less material; are cost and time efficient; and reduce waste and rework.

Yet, while many contractors are adopting technologies to streamline delivery, many still lag in putting sustainability and the environment at the top of their agendas.

MANAGING WASTE

Perhaps the best example of this is the responsible management of construction material waste. A huge amount of waste is created due to poor planning, quality control and communication on construction projects. However, the volume of waste generated throughout the project life cycle can be hard to track.

According to the World Green Building Council, construction, demolition and renovation account for around one-third of global solid waste production each year. Applying this to the regional project pipeline, the inference would be that billions of dollars will be wasted before even taking into

500

NUMBER OF NET-ZERO COMMERCIAL BUILDINGS WORLDWIDE

- World Green Building Council

TABLE 2: FORMATION OF GREEN BUILDING SYSTEM IN DUBAI

2007
Dubai Green Building Regulations and Specifications established

2011
Dubai municipality makes the regulations mandatory for all government buildings

2014
Implements strategy and makes the regulations mandatory for all new buildings in Dubai

2016
Existing green building code upgraded to a Green Building Ratings System called Al-Safat, dependent on sustainability compliance

2020
Al-Safat system upgraded to Dubai Green Building Regulations and Specifications

Source: www.dm.gov.ae

consideration the environmental impact.

The issue is one the authorities are moving to tackle. One example is Dubai. In order to reduce the environmental impacts and improve the socio-cultural and economic performance of buildings, it has introduced various sustainability rating systems and green building regulations (see Table 2 above). It has also pledged to reduce the amount of waste being sent to landfills to zero within 20 years.

In neighbouring Abu Dhabi, the authorities have mandated the recycling of construction materials, stipulating the inclusion of 10 per cent recycled aggregate on government projects, while its Executive Council has mandated the recycling of at least 40 per cent of materials used in road and construction projects.

Similarly, Ras al-Khaimah now requires 20 per cent of the fuel for cement kilns to come from renewable sources, if available.

Saudi Arabia too has recognised sustainability as an important policy issue. By 2030 the kingdom says it intends to divert 60 per cent of construction and demolition waste from landfills, recycling 12 per cent, reusing 35 per cent and treating 13 per cent.

Environment aside, construction waste is incredibly costly for companies, especially now that high inflation and a shortage of supply have led to sizeable material cost increases.

Jihad Bsaibes, CEO at Amana Contracting, has seen average increases of up to 25 per cent in the prices of steel (structures and reinforcements), aluminium, copper and chemicals over the past 12 months.

"Inflation caused by global macro-economic issues has squeezed profitability and is straining the supply chain and contractors," he says.

Variation orders or rework caused by incomplete or poorly-specified designs lead to monetary and productivity losses in addition to the wastage of allocated resources and delays in project delivery. The cost of rework on projects is estimated to be 6-15 per cent of the total budget, according to a MEED Construction Industry survey conducted in 2020.

Faced with the dual cost and sustainability challenge, firms need to look at how they can improve communication among the various project stakeholders, increase visibility of potential problems, and ensure accurate and comprehensive documentation.

Adoption and efficient use of construction technology is the most obvious solution to achieve this. "Leveraging innovative construction methodologies has enabled us to shorten production cycles and foster collaboration, reducing rework and iterations," says Bsaibes.

"Amana focused on material price forecasting and increased digitalisation to address challenges, including effective project management through accurate estimating, tracking and timely delivery.

THE COST OF REWORK IS ABOUT

6-15%

OF THE TOTAL BUDGET OF THE PROJECT

~ MEED Construction Industry survey

With proper planning, risk assessment and aggressive technological adoption that reduces material and labour requirements, Amana has been able to tide over challenges and deliver projects on time," he explains.

To achieve such ambitions, construction projects must use a central connected platform that can be shared seamlessly across the business to facilitate improved communication and transparency, minimise the risk of errors and rework, and record an accurate history of the project.

SUSTAINABLE MATERIALS

Delivering buildings that are truly green is a lot to ask from the construction industry, which has been slow to adopt significant sustainability reforms. This is especially the case given the unfortunate reality that project clients often prioritise cost above all other factors. But with regulations increasing, the pressure is building for contractors to act fast.

"Great strides are being made [in Dubai] across the entire value chain, from green, carbon-capturing concrete to low-energy reinforcements," says Roy Saker, chairman of Australian construction company Modular Precast Systems. "Construction is a business with thin margins. "The reality is that when it comes to sustainability or survival, when given the choice, most contractors will choose the cheaper option over the more sustainable one.

"However, with research and development of new sustainable materials achieving parity in performance, as well as becoming cheaper than their less sustainable rivals, we are seeing a swift uptake of new construction materials in the Middle East construction industry," he adds.

Construction companies should also not necessarily view greater sustainability measures as an additional expense. Dubai Municipality's 2015 ruling that green cement – which incorporates recycled materials, thereby reducing consumption of natural raw materials, water and energy – should be used for the construction of new buildings in the emirate and is estimated to have achieved cost savings of $52.3bn for the industry, as well as increased the lifespan of buildings by 40 years, according to market research firm Frost & Sullivan.

Looking forward, firms and the sector as a whole will have to increasingly accept that current practices must change, for example by moving to increased modularisation or exploring innovative technologies such as drones, robotics and digital twinning.

In the end, they may find they have no choice. The industry is moving in one direction and only companies that flow with it are likely to prosper.

2,000

NUMBER OF NET-ZERO HOMES AROUND THE GLOBE

- World Green Building Council

GREEN BUILDING RATING SYSTEMS

Around the world, green building rating systems are used to provide a framework to support healthier, more efficient and greener living and working environments.

LEED (Leadership in Energy and Environmental Design) certification: The most widely used internationally recognised scheme that awards points to a project according to metrics relating to carbon, energy, water, waste, transportation, materials, health and indoor environmental quality.

BREEAM (Building Research Establishment Environmental Assessment Method): Published by the Building Research Establishment in 1990, BREEAM is the world's longest established method of rating the sustainability of buildings.

GSAS (Global Sustainability Assessment System): Developed in Qatar in 2010 after analysis of existing building codes from around the world, the GSAS system aims to address local community needs and conditions while maintaining rigorous international standards. QSAS certification is mandatory for all private and public sector projects in Qatar. Saudi Arabia, Kuwait, Jordan and Sudan have shown an interest in adopting GSAS as a unified green building code for the region.

PEARL: This Abu Dhabi rating system is designed to address building requirements in a region characterised by high temperatures and low rainfall. It provides guidelines to rate a project - from one to five pearls - with respect to Estidama (or sustainability). A minimum certification of one pearl is required for all new developments in Abu Dhabi.

ARZ Building Rating System: With a focus on commercial buildings, Lebanon's first green building rating system uses an evidence-based approach to assess the operational efficiency of a building to boost sustainable building practices in the country.

ONE VERSION OF TRUTH

Facing rising costs, supply chain challenges and ambitious regional urbanisation targets, Gulf construction is turning to new technologies to drive productivity

35%

PROPORTION OF SURVEY RESPONDENTS WHO STATE THAT THEIR CLOUD COMPUTING BUDGETS TARGETING THE IMPLEMENTATION MODEL HAVE INCREASED

- MEED/GlobalData ICT Decision Makers Survey 2022

Digital technology is transforming project delivery globally.

Despite this, until now the Gulf construction industry has been a reluctant participant in the digital revolution. A focus on delivery at the lowest possible cost, coupled with demanding deadlines, incomplete designs, challenging on-site conditions and a shortage of digitally trained employees, has traditionally impeded the uptake of digital technology.

This is changing as industry stakeholders are beginning to realise the benefits of implementing advanced technologies in unlocking greater efficiencies, productivity, sustainability and wellbeing.

A 2022 MEED/GlobalData ICT decision makers' survey reveals a positive outlook for ICT spending in the construction sector. Nearly 20 per cent of the respondents claimed that there has been more than a 6 per cent increase in their enterprises' ICT budgets for 2022 compared with 2021. This in part reflects the increasing willingness of the industry to embrace construction technologies to drive smarter construction.

The gradual change in outlook can be largely attributed to the growing exposure the industry has to technology and the understanding that it can help detect, prevent, predict and optimise project delivery to ensure improved productivity and safety.

Like elsewhere, the global pandemic acted as a catalyst for change. While more adventurous construction industry professionals were already pioneering new technology to improve operations before Covid-19, it brought a new urgency to change the way that projects were managed and delivered. Remote working, social distancing and supply chain

"In 2021, investment in the construction technology ecosystem crossed $4.5bn"

Source: Cemex Ventures

disruption were immediate challenges, but an ongoing rise in the cost of raw materials, along with wage inflation, continue to impact the sector.

"There has never been a greater need for clear communication, increased collaboration and extensive digitalisation in the industry," says Anas Bataw, director at the Centre of Excellence in Smart Construction (CESC), Heriot Watt University – Dubai.

TRUE PLATFORM

While front-line construction crews have returned to job sites, many supporting personnel have continued to work from home, making it more important than ever to take advantage of cloud-based technologies and workflow solutions to keep remote workers connected to the construction site.

Bataw says that technology-enabled remote project management tools can improve communication and collaboration among all stakeholders to reduce the need for rework on a project.

"Deploying cloud-based software allows all parties to see, share, coordinate and use data, even when teams are widely dispersed," says Bataw.

Digital platforms (see Figure 3 below) enable the execution of multiple tasks in one place. With data fed directly from the construction site and by dispersed teams, such platforms simplify planning and design, enhance data management, reduce safety risks and improve decision-making.

They can also provide reports that accurately reflect project progress and help in tracking project spending for tighter budget control. Traditional methods of compiling this information on spreadsheets or even handwritten documents take time and often contain information that is outdated and

FIGURE 3: HOW CONSTRUCTION PROFESSIONALS CAN INCREASE VISIBILITY INTO THE PROJECT BY CONNECTING ALL PEOPLE, APPLICATIONS AND DEVICES ON ONE CENTRAL PLATFORM

> **"By utilising data, analysis and calculations to make informed decisions, Alec has seen up to 400% improvement in processes"**
>
> ***-Imad Itani, Alec***

inaccurate. Having the ability to shorten this process therefore can save time, effort and money.

In addition to increasing the efficiency of project delivery, digital platforms can also be used to manage the social and environmental impact of a development, from the disruption to the local community during construction, to emissions and energy consumption once in operation. These considerations are becoming increasingly important as environmental, social and governance (ESG) principles have risen up the agendas of governments, clients and end-users.

In time, data collected throughout the life cycle of a project - from planning (pre-construction), construction and end-use, to demolition and the recycling of materials - will enable better decision-making, giving way to more accurate planning for future developments.

The value of digitalisation is not lost on Dubai-based construction company Alec Engineering & Contracting. The company's head of innovation, Imad Itani, says that Alec implements about 20 digital initiatives every year, which enable its teams to utilise data, analysis and calculations as a basis for informed decision-making.

"By analysing operations and concentrating on low-productivity areas, Alec has seen improvements in processes ranging from 10 per cent up to 400 per cent," says Itani. "However, a significant amount of work and investment was required to facilitate real-time, data-driven insights."

This reinforces the need for an easy-to-use, holistic management platform that enables visibility across different teams and allows them to work more efficiently.

"Construction professionals are not data scientists," says Itani. This makes it even more important to deploy an easy-to-use platform that improves visibility across projects and can be used by professionals of varying expertise.

Despite the urgent need to implement digital technology in the GCC construction industry, Itani says that it takes time to build capabilities, and digital solutions may have to be tailored to suit the specific needs of a construction company or project. Patience is therefore needed, as well as a willingness to accept failure.

"Make sure to create a means for streamlined knowledge sharing across projects to bolster adoption," says Itani. "After all, solutions will get more mature and effective as they are used for a longer time and in multiple use cases."

SMART DECISIONS

Mohamed Swidan, Mena head and senior director at US construction management software company Procore, says that to achieve successful data usage, construction firms need platforms that support third-party applications.

"Similar to a physical platform, these digital platforms provide a base structure onto which multiple components can attach. From this, users are able to consolidate information into this one collaborative and integrated ecosystem, with all vital data and communication at their fingertips," says Swidan.

It is critical that construction professionals differentiate between technologies that only provide a temporary fix, and those that will enable long-term efficiency.

"Many software providers will claim to offer cloud-based, connected construction solutions but when we strip that back, what they actually provide is somewhat of a connection between point solutions," says Swidan. "This cobbling together of solutions will force users to copy and paste data and information from one application to the next, leaving insights vulnerable to human error and inaccuracy."

Adopting a more collaborative approach with a dedicated platform vendor can help enable long-term digital evolution for clients.

49%

SHARE OF RESPONDENTS WHO SAY THERE HAS BEEN UP TO A 6 PER CENT INCREASE IN BUDGET ALLOCATION FOR NEW SOFTWARE

- MEED/GlobalData ICT Decision Makers Survey 2022

EXPERT VIEWS

Challenges and recommendations for tech adoption and investment

Resistance to Adapt to New Methods

FADI MASSOUH
Managing partner, TSSC Glass & Aluminium Works
The management at construction companies needs to be open-minded to trying new technologies to improve their business operations and advance the industry. Workers, who are used to working in a certain manner, will always resist change. It is the duty of the management to force the change to happen. Software companies can overcome the lack of sufficiently skilled labour by offering training to construction firms.

DAVID GLENNON
Senior digital delivery director, Red Sea Global
As projects typically have a relatively short lifespan, there is always pressure to show a return within that project for the client. In reality, any meaningful and sustainable transformation will take years – it is a multi-project investment with multiple stakeholders involved. The key is to demonstrate short-term gains that are aligned to the project challenges or organisational strategy, and to have these aligned to the long-term vision.

Lack of Sufficiently Skilled Labour

MARK BENAICHA
Managing director, ESMOS Recruitment
We are seeing a post-pandemic boom in the market. This shortage of labour/talent is effectively an increase in demand due to the surge in business activities and rapid growth. Most people put it down to a skills shortage, but what we have seen in the market is that the demand has increased and more skilled labour is required than ever before. At least 80 per cent of our placements are overseas hires to help accommodate the demands of our client base in the Mena and Apac regions.

Material Price Increases and Inflation

JIHAD BSAIBES
CEO, Amana
The global pandemic and supply chain issues underscored the need to invest in digital transformation and sustainable technologies to future-proof our business. Integration of assets, people and processes into a single intelligent and secure platform can help improve operational efficiencies and transparency, reduce errors and fast-track projects to successful completion. Leveraging innovative construction methodologies helps shorten production cycles and foster collaboration, reducing rework and iterations.

Lack of Awareness of New Technology

BEN JACKSON
Head of project and development services MEA, JLL
This is quickly changing, with data initiatives in construction and real estate being driven from the C-suite and board level, as well as from within the project teams. Continued maturity and implementation of robust data strategies is paving the way for the era of predictive insights. As applications, smart technologies and the overall construction and real estate market enter the next phase of technology adoption, data will be central to improving project delivery and optimising construction in the years ahead.

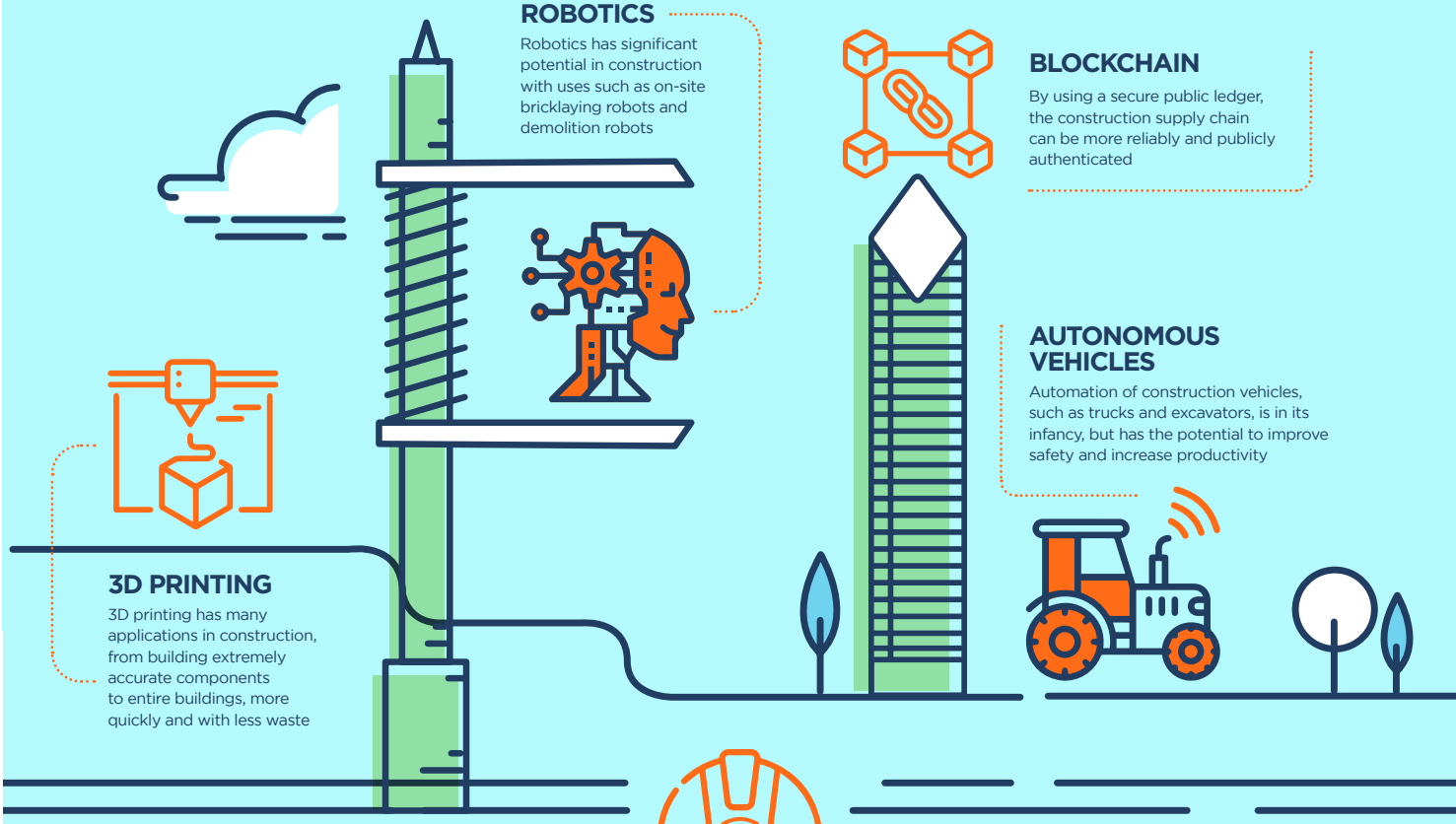
Siloed Data Across Project Teams

STEVE GRIFFITHS
Senior vice president, research and development, Khalifa University
Innovation in the construction sector is inherently challenging due to strict regulation and limited near-term financial gains from the development and implementation of new technologies. However, government stakeholders can help overcome these barriers through targeted public procurement initiatives. Beneficial initiatives are those that provide market incentives for the development and use of new technologies and that ensure the establishment of a regulatory environment supportive of novel technologies.

Regulatory Uncertainty

DINO WILKINSON
Partner, Clyde & Co
Data-driven construction requires a robust regulatory framework to offer legal protection for information and data. A lack of appropriate legislation in this area creates uncertainty about the rights and obligations that attach to data. Fortunately, this is being recognised with a wave of new regulation in the Middle East. These laws will create some new compliance burdens but should increase the level of certainty for contractors, developers and other parties, to allow them to invest in and deploy technology with more confidence.

CONSTRUCTION TECHNOLOGY TRENDS IN 2023



ROBOTICS

Robotics has significant potential in construction with uses such as on-site bricklaying robots and demolition robots

BLOCKCHAIN

By using a secure public ledger, the construction supply chain can be more reliably and publicly authenticated

AUTONOMOUS VEHICLES

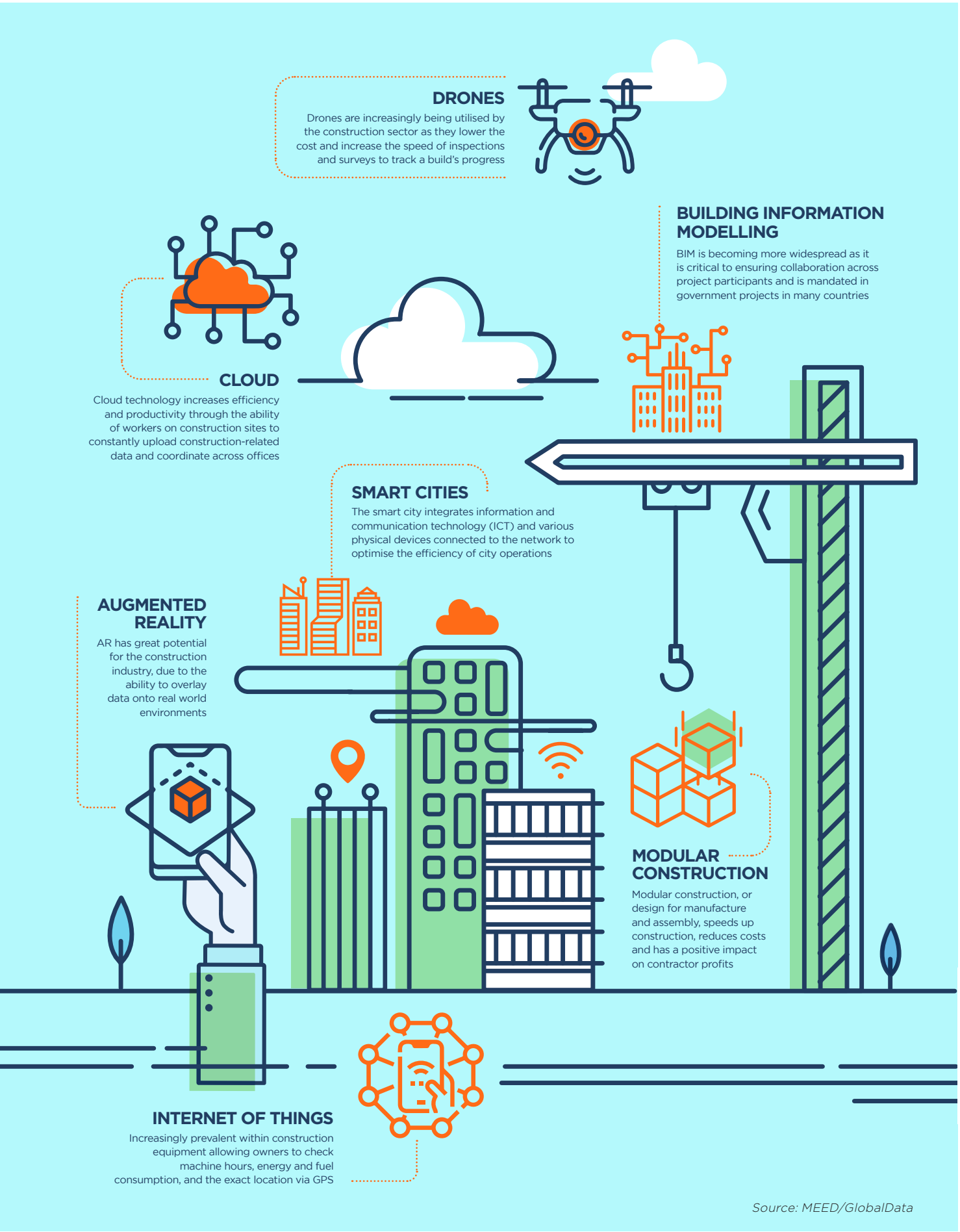
Automation of construction vehicles, such as trucks and excavators, is in its infancy, but has the potential to improve safety and increase productivity

3D PRINTING

3D printing has many applications in construction, from building extremely accurate components to entire buildings, more quickly and with less waste

WEARABLE TECH

Wearable technology has a number of benefits across the construction industry, particularly in regards to safety, productivity, communication and improved data collection and processing



Source: MEED/GlobalData

CONCLUSION

Construction companies are increasingly relying on digital technologies to achieve a competitive advantage, improve efficiency, productivity and safety, reduce costs and enhance the quality and sustainability of the completed project.

However, success through technology implementation is not just about using technology on projects. It is also about using the right solution that simplifies and standardises processes and workflows, and ensuring that it is properly used by fully-trained employees who understand the value it can bring.

By creating standards and transforming data taken from different sources into a consistent format, project teams can gain a better understanding of the project throughout its lifecycle.

And by implementing a scalable, cloud-based construction management platform that aggregates, organises and clarifies project data in a collaborative virtual space, construction professionals can lower the risk of miscommunication with a single, transparent source of project truth.

The industry is also responding to environmental concerns by investing in new technology and the development of sustainable construction through a greater emphasis on reducing rework, cutting waste and by participating in green certification schemes.

More importantly, companies must transform their culture in terms of their hiring policies, retraining and upskilling of staff through internal initiatives as well as training programmes and certifications offered by vendors.

Construction companies that take advantage of the key ongoing technological themes are well placed for long-term success. Over the next 12 months, there is likely to be even greater acceleration in the trends explored in this report to the point that they become the norm rather than the exception.

OUTLOOK FOR THE YEAR AHEAD

1. **Collaboration and visualisation tools will be key to the future of work**
2. **Advanced data analytics will drive visibility and enhance resilience**
3. **The application of technology to reduce waste and rework will increase**
4. **Remote worksites and distributed teams will remain commonplace as digital tools and apps continue to provide accurate documentation to clients, contractors and inspectors, allowing some aspects of project completion to occur offsite**
5. **Increased use of virtual construction technologies such as construction management software and building information modelling will help engineer and visualise projects digitally**
6. **Emerging solutions as such as modular construction and green building practices will see greater adoption**
7. **Growing demand for greater regulation of digital technologies on projects, especially calling for greater transparency and stringent standards**
8. **Demand will grow for industry-wide metrics to deliver and measure sustainable, low-carbon and resilient buildings**
9. **Talent shortages will push companies to change their business practices and drive innovation to attract the best**
10. **Digital tools will be used to analyse and predict hazards to improve worker safety**

Source: MEED/GlobalData

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Procore is a leading provider of construction management software. Over 1 million projects and more than $750bn in construction volume have run on Procore's platform.
Our platform connects every project stakeholder to solutions we've built specifically for the construction industry—for the owner, the main contractor, and the subcontractor. Procore's App Marketplace has a multitude of partner solutions that integrate seamlessly with our platform, giving construction professionals the freedom to connect with what works best for them.
Headquartered in Carpinteria, California, Procore has offices around the globe, including Dubai, Paris, London, Sydney, and more.

To find out more, visit
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ABOUT MEED

MEED has been integral to delivering business information, news, intelligence and analysis on the Middle East economies and activities for over 65 years.

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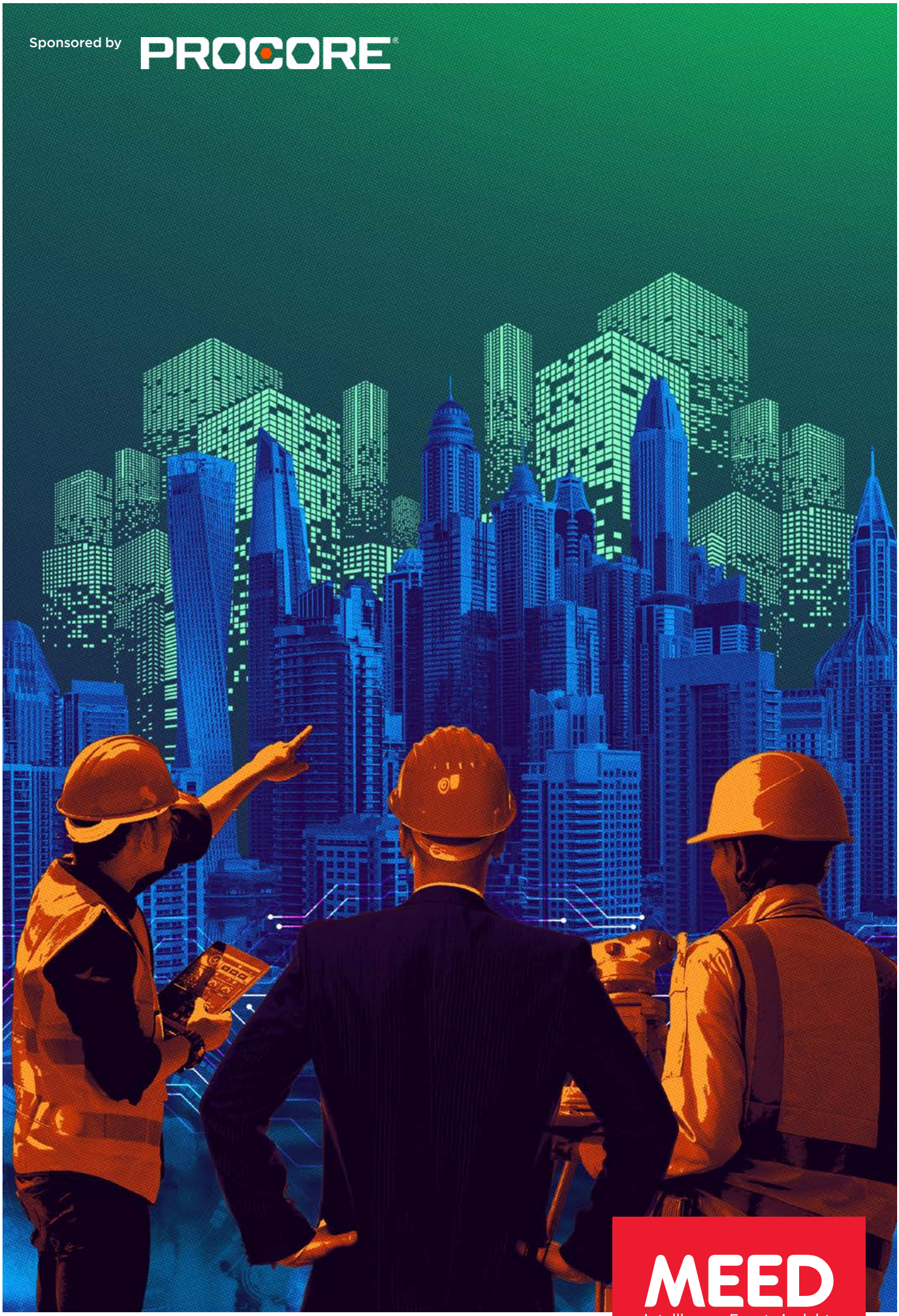

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