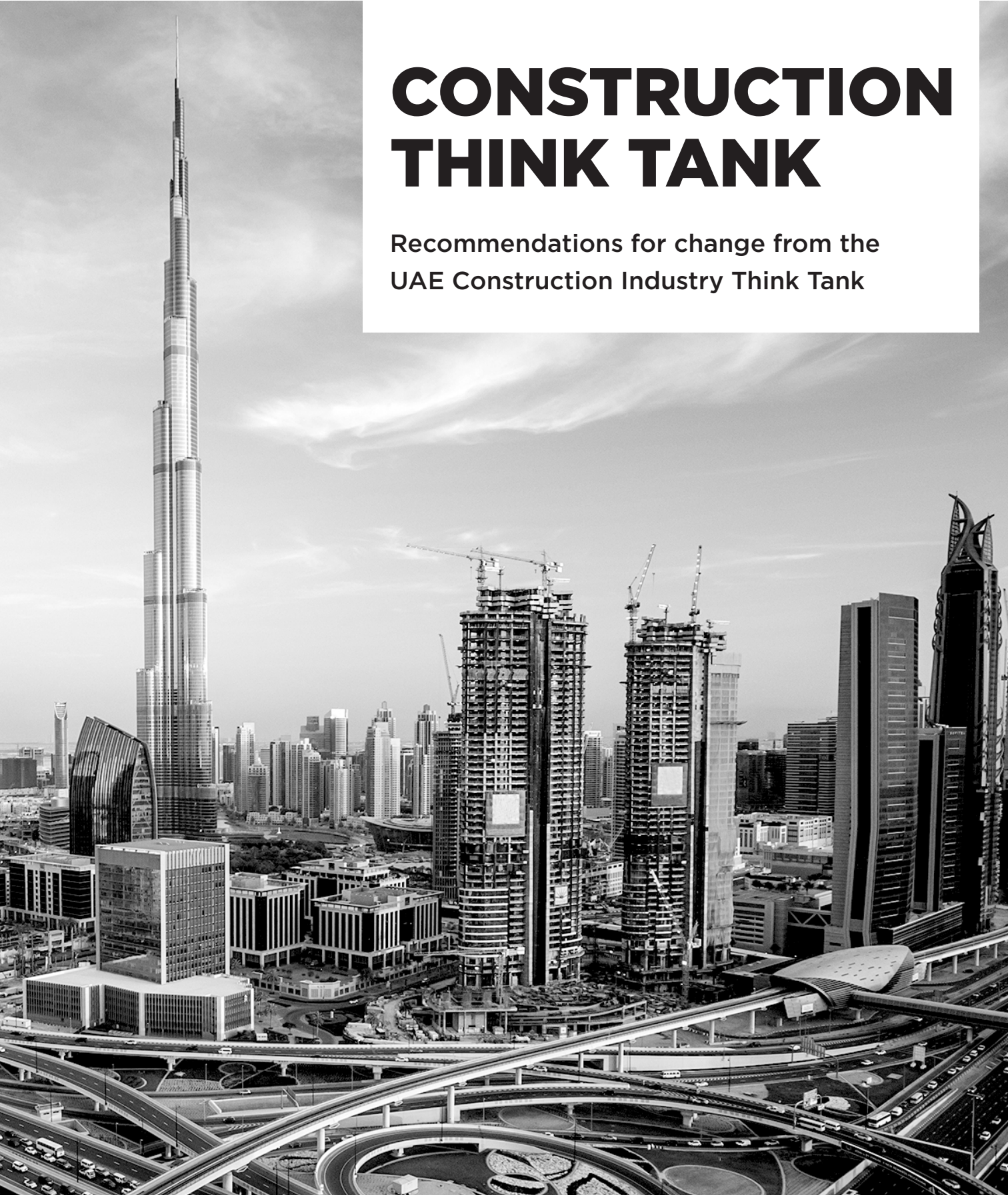


CONSTRUCTION THINK TANK

Recommendations for change from the
UAE Construction Industry Think Tank





THE UAE CONSTRUCTION INDUSTRY
MUST BUILD ON ITS ACHIEVEMENTS
TO DEVELOP THE CAPABILITIES
AND COMPETENCIES OF THE UAE,
WHILE EXPANDING REGIONALLY AND
INTERNATIONALLY TO PROVIDE NEW
LEVERS OF ECONOMIC GROWTH”

FOREWORD

The capabilities of the UAE construction industry are known around the world. From the Burj Khalifa and Dubai International airport to the Louvre Abu Dhabi, the UAE's architects, engineers, contractors and manufacturers have built a reputation for being able to deliver world-class projects. But the achievements of the past do not guarantee future success. And many of the challenges ahead will be different from those of the past.

This white paper recommends actions to foster a new ecosystem for the UAE construction sector, and to build a community that supports continuous improvement and which will deliver the objectives of UAE Centennial 2071.

The UAE's strategic vision defines a path to establish the country as the most competitive nation in the world by its 100th birthday. Integral to this path is the construction industry. The vision calls for the most modern, productive and technology-driven construction industry worldwide.

The UAE construction industry must build on its achievements to develop the capabilities and competencies of the UAE, while expanding regionally and internationally to provide new levers of economic growth.

Construction firms, government authorities and academics must come together to nurture new talent, stimulate research and enable innovation. Traditional roles must also change to remove adversarialism and other barriers to progress.

The recommendations within this white paper have been produced by the UAE Construction Think Tank, a focus group of leading industry stakeholders brought together by Mashreq and MEED. It is my hope that this document provides valuable insights on how to improve project delivery in the UAE and a model for continuous improvement in UAE construction.



THE VISION
CALLS FOR THE
MOST MODERN,
PRODUCTIVE AND
TECHNOLOGY-
DRIVEN
CONSTRUCTION
INDUSTRY
WORLDWIDE”

HE Abdul Aziz al-Ghurair

CEO
Mashreq Bank

INDUSTRY REPRESENTATIVES



THE PURPOSE

THINK TANK

As part of the MEED-Mashreq 2019 initiative, senior representatives from across the UAE construction sector met to identify actions that could be taken by government, industry and academic institutions to enable change in the UAE construction industry. The objective of the UAE Construction Industry Think Tank was to produce a set of industry-led recommendations for initiatives that could be considered by the government to enable a more productive economy, in line with the goals outlined by UAE Centennial 2071. The industry is ready to move away from the traditional practices that have slowed it down in the past. Strategic government actions aligned to industry needs are vital to facilitate change, and to deliver a productive and efficient industry.



VISION 2071

Announced in March 2017, UAE Centennial 2071 provides a long-term vision for where the UAE wants to be on the 100th anniversary of its foundation. The vision is a comprehensive government plan that encompasses a national strategy to strengthen the country's reputation and soft power; ensure that government revenue is diversified, relying less on oil; introduce education programmes focused on advanced IT and engineering; and consistently build Emirati values and ethics for future generations. Central to the vision is enhancing the productivity of the national economy and building community cohesion.



RECOMMENDATIONS

COLLABORATION



- Introduce and promote standard contracts to ensure risk is shared fairly by clients, consultants and contractors. Contracts should seek to share risk and offer pain/gain opportunities.
- Enforce a Construction Contracts Act applying to UAE construction works, codifying payment time-frame, adjudication and certification terms. At present, clients are free to impose conditions due to the highly fragmented and bespoke nature of the industry.
- Place restrictions on contractors with less experience or a negative track record by judging them on the basis of technical competence to ensure submitted bids focus on best practices and whole-life cost. The current lowest-price-wins model rewards a short-term approach to quality, safety and innovation.
- Introduce a contractor accreditation scheme that grades contractors in terms of financial strength, and technical and practical capability.

TALENT



- Grant permanent and semi-permanent visas for professionals on the basis of experience and professional attainment, not just academic qualification.
- Provide a transparent pipeline of future projects, allowing contractors to counter the transient nature of construction contracts and better plan for their staff. Coordinate timing of government and government-related entity (GRE) projects to ensure countercyclical spending.
- Establish professional development bodies for technical workers and a unified accreditation committee for built environment professionals. Work closely with renowned international bodies such as the UK's Institution of Civil Engineers (ICE) and others.
- Conduct graduate recruitment programmes in partnership with industry players to overcome the challenges of losing younger talent to more lucrative professions.

INNOVATION



- Introduce incentive schemes to reward companies that deploy new technology on their projects. This would ultimately boost the image of the country and support the development of local supply chains.
- Establish regulations concerning emerging technologies such as robotics and artificial intelligence. Only then will companies be able to openly test them on sites.
- Specify common standards and requirements for technology and data to harmonise processes across all sectors and authorities.
- Institute a patent system for innovative methods employed by a contractor on a project. Offsite manufacturing can help a contractor retain full control over the design of its solution.

VOICE



- Establish a Construction Industry Development Board to encourage continuous dialogue between the industry and authorities. This board could help set standards and regulations, while also addressing disputes and other legal matters. It could also monitor projects that generate a greater number of disputes and investigate the reasons for this.
- Create relevant accreditation bodies to help guide workers on the training needed to secure job positions within the market. Engage with international organisations such as the UK's Institution of Civil Engineers (ICE) for best practice in accreditation.
- Establish a more active association that engages with government and project clients, and helps regulate industry and maintains standards. Enable the relevant statutory authorities to better monitor stakeholders.

THE OPPORTUNITY

CONSTRUCTION PLAYERS NEED TO WORK IN TANDEM WITH THEIR SUPPLY CHAIN TO IMPROVE PRODUCTIVITY

Improving productivity in the UAE construction market is a challenging proposition. Low margins and slow payment terms dominate projects and create a necessity for contractors to carry out work at rock-bottom prices. If there is an area where contractors can save money, the chances are it has already been found.

Perhaps the biggest challenge facing the construction industry is the need to overturn the long-established and highly damaging practice of ‘lowest-price wins’. It is widely proven that awarding construction contracts to

From the outset, virtual reality and digital models can enable clients to better understand, and define, how they want their projects to look, feel and function. Designers are using algorithms to simplify the engineering process and are developing cloud-based generative designs to develop more options in less time, ensuring clients receive the optimal solutions, which in turn can drive better contracts in the UAE.

Adoption of building information modelling (BIM) by clients means that virtual versions – ‘virtual twins’ – of projects can be built before the physical asset emerges, allowing contractors to detect clashes, quickly obtain crucial information and better align their work with the design.

Offsite prefabrication and modularisation through design for manufacture and assembly has taken off, with undeniable time and cost savings in projects around the region.

Projects are managed through online, often cloud-based, collaborative platforms, and have increased transparency, accountability and reduced delays. Data is being retained and reused, enabling live benchmarking and giving clients virtual models of their assets that can revolutionise asset management.

For the UAE to harness the benefits promised by the digital revolution, significant challenges must be overcome. The country’s top-level commitment to innovation supports significant investments in technologies such as 3D printing and drones, and gives the UAE construction industry an ideal platform from which it can seize the opportunity to improve.

But the industry cannot deliver the required transformation on its own. It is vital that it is supported by government agencies, whose approval and permitting processes frequently do not match the national vision and slow the adoption of innovative practices.

TOOLS FOR TRANSFORMATION

Methods to improve productivity of the construction sector:

- Reshape regulations and raise transparency
- Rewire the contractual framework
- Rethink design and engineering processes
- Improve procurement and supply chain management
- Improve on-site execution
- Infuse digital technology, new materials and advanced automation
- Reskill the workforce

Source: *Reinventing Construction*, McKinsey Global Institute

the cheapest tender will generally result in the most expensive project due to the additional cost of delays, poor workmanship and repairs. Construction clients need to be re-educated to consider whole-life costs when assessing construction contract bids.

Continuing to do things in the same way will not deliver the transformation the construction industry needs. Bold steps are required to break some of the negative practices that have become entrenched in the industry.

The industry is witnessing the first stages of digital transformation, which is delivering step changes in productivity.

SUPPLY CHAIN REFORM

Supply chain relationships require an equally comprehensive overhaul to realise the full benefits of the transformation.

Improved engagement and communication with the supply chain is vital if the construction project circle is to be closed and project owners are to benefit from the experience of the contractors and suppliers.

Project sponsors must reduce their focus on the cheapest option and should not leave contractors to take disproportionate risk as this leaves no room for investment in innovation.

These opportunities for improvement are being taken by some of the UAE's more enlightened construction clients, including many of those working on the delivery of Expo 2020. Such firms are raising the quality requirements and using global best practice in procurement.

But, as with the new approach to data sharing currently enabling digital transformation, new approaches to supply chain management need to be cascaded through the industry before the country's projects market can make the most of the opportunities being trailblazed by the industry's pioneers.

STRENGTHS

- Mature supply chains with strong local capacity and capability
- Multi-disciplinary contractors apply learnings from other markets such as oil and gas
- High-level commitment to new technologies and digitalisation
- New contract arrangements are successfully implemented and delivered
- Mature clients form long-term relationships with trusted contractors that are involved in projects at an early stage
- Leading clients mandate digital modelling and information sharing between project parties

WEAKNESSES

- Lack of trust and accountability sharing among project owners and contractors
- The 'construct only' contract market places disproportionate focus on price over quality in construction projects
- Too many contract clauses and specifications are cut and pasted
- Client requirements or engineering design are not clear or changed post award
- Contractors bid too low to deliver work on budget, and then seek to claim for variations
- Inappropriate risk allocation, bonds are too high and client payments too slow
- Developers/designers are not incentivised to consider full building lifecycle costs

OPPORTUNITIES

- Collaborative project models using building information modelling can lead to time and cost savings on projects
- Government support for smarter technology drives innovation at a strategic level
- There is the potential for Dubai to become a leading global centre for 3D printing
- Wider use of prefabrication and design for manufacture and assembly (DfMA) could accelerate construction
- Pursuing quality ahead of lower capital costs would lead to greater long-term benefits and savings through more efficient maintenance and operations

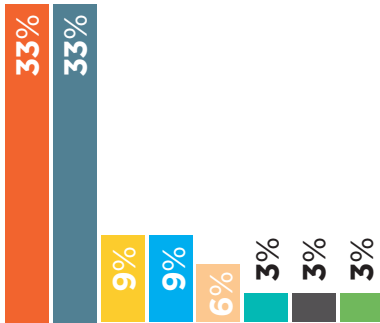
THREATS

- Clients are unwilling to accept that contractors must generate profits if they are to invest in new technologies and deliver the government's aspirations
- Engineers are not empowered by clients to manage issues on projects as they arise
- Disengagement of clients that maintain control of projects but try to pass on all the risk to the rest of the supply chain
- Inadequate contract administration leads to more claims of poor quality
- Conservative regulatory approach to new technologies and construction methods
- Statutory authorities lack the incentive to partner with industry

LOOKING TO THE FUTURE

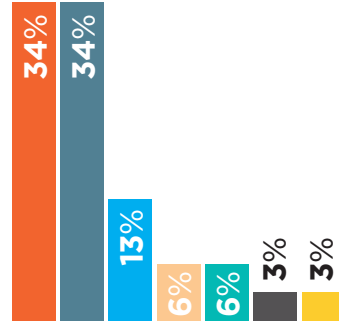
UAE construction is waking up to the benefits of digital transformation

WHAT IS THE MAIN CHALLENGE TO INNOVATION IN CONSTRUCTION?



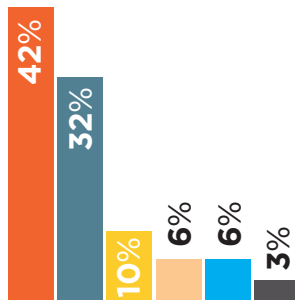
- Low contracting margins
- Getting people to behave differently
- Lack of skills
- Other
- Lack of education in technology
- Getting paid
- Lack of immediate benefits
- Unsupportive regulations

WHAT CAN BE DONE TO ACCELERATE CHANGE IN CONSTRUCTION?



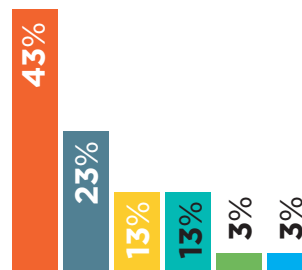
- Clients require specific technologies
- New forms of contract linking design, construction and operations
- Other
- Government creates a centre for construction research
- Construction companies invest in technology partnerships
- New regulations requiring increased R&D spend
- Long-term supply chain agreements

WHAT TECHNOLOGY OFFERS THE BIGGEST GAINS?



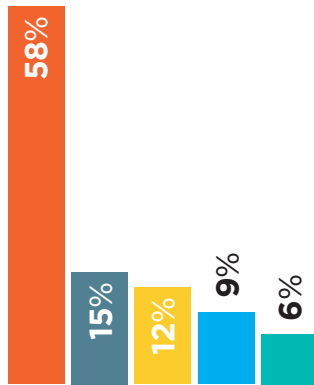
- Offsite prefabrication of modular units
- Building information modelling
- Robotics
- Cloud-based project management platforms
- Other
- 3D printing

WHAT IS YOUR COMPANY'S APPROACH TO THE ADOPTION OF DIGITAL TECHNOLOGY?



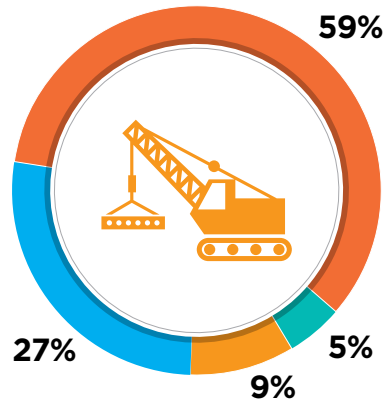
- Project-by-project basis
- Purchase technology expertise when need arises
- Annual technology R&D budget allocation
- No digital development strategy
- Working with technology partners
- Other

HOW SHOULD PROJECT STRUCTURES AND PROCESSES CHANGE IN ORDER TO MAKE THE MOST OF NEW TECHNOLOGY?



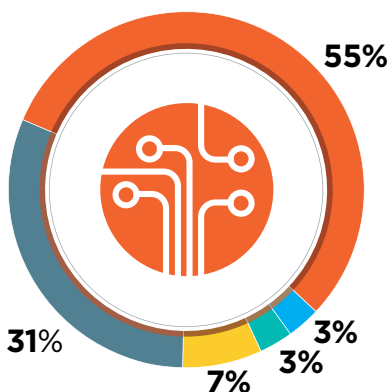
- Greater collaboration between project teams
- New laws for contracting
- Information must be more transparent and shared
- Digital models must be standardised and mandated
- New forms of contract required

WHAT IS THE PRIMARY BENEFIT OF DIGITAL INNOVATION IN CONSTRUCTION AND PROJECT DELIVERY?



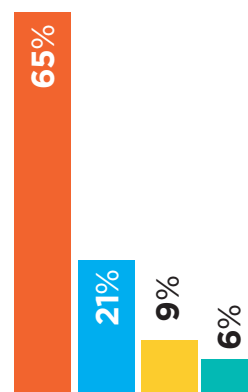
- Efficiencies that will speed up project delivery
- Cutting construction costs
- Improving collaboration between end-user, contractor and designer
- Providing accurate as-built asset data to support lifecycle operations

WHAT TECHNOLOGIES IS YOUR COMPANY INVESTING IN?



- Building information modelling
- Cloud-based project management
- Robotics
- Smart contracts (blockchain)
- Other

HOW ARE YOUR COMPANY'S PROCUREMENT PROCESSES CHANGING?



- We are investing in new platforms and technology
- We are planning to change our processes
- We are restructuring our internal and external suppliers
- We have no plans to change

Source: MEEED Construction Industry Survey, 2018

THE CHALLENGE

CONSTRUCTION AND INFRASTRUCTURE PROJECTS ACCOUNT FOR THE BIGGEST PROPORTION OF PROJECT SPENDING

Mounting pressures on cash flow and margins due to increased competition means that construction companies must deliver projects more efficiently in order to maintain profitability. This requires being more productive.

Globally, the construction sector appears to have stagnated, with productivity gains totaling a meagre 6 per cent over the past 60 years, according to the McKinsey Global Institute. This is considerably lower than industries such as manufacturing, where technology and automation have driven productivity improvements of over 1,000 per cent over the same period.

The biggest gains can be achieved by tackling the root cause of the issues affecting most construction projects – culture.

WORKING TOGETHER

Collaboration between the various actors working on a project needs to be enhanced. Projects that are successful benefit from having a project team with a client, consultants, contractors and suppliers that are all working together to get the job completed, while those that fail are blighted by mixed agendas, poor communication and adversarial tensions.

While contractors have an important part to play in those project teams, the leader of the project is the client, and without a commitment to work with the other actors involved the scheme is unlikely to be a success for all parties. The traditional ‘master/servant’ relationship could change in the future as the nature of project delivery changes.

As government budgets continue to be constrained, contractors are now being tasked with financing as well as building infrastructure.

As alternative ways of delivering infrastructure such as public-private partnerships (PPPs)

are used, contractors will have more control over the way projects are delivered as they will have the opportunity to be a part of the client body responsible for delivering the project in the form of the concessionaire.

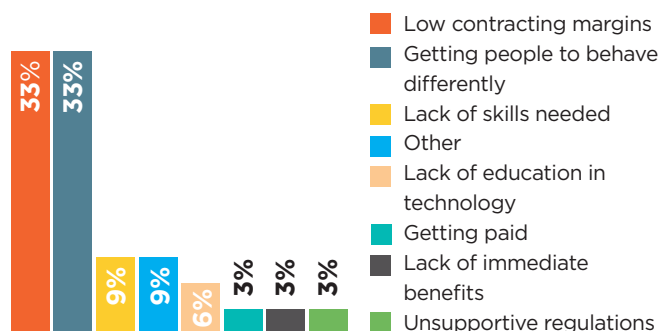
INDUSTRY 4.0

The other megatrend affecting the UAE construction industry is the disruptive impact of digital technology, or the so-called ‘fourth industrial revolution’.

Over the past two decades, there have been sweeping changes to a wide range of other sectors as technological innovations driven largely by the internet have transformed the way these sectors operate.

The problem for construction companies is that investing in technology and innovation is an upfront cost that makes them less competitive if bidding against companies that are not making the same investments. This disincentivises firms and could undermine Dubai’s vision for the construction industry.

WHAT IS THE MAIN CHALLENGE TO INNOVATION IN CONSTRUCTION?



THE QUESTION

WHAT CAN THE UAE GOVERNMENT DO TO ENABLE THE CONSTRUCTION INDUSTRY TO DRIVE A MORE PRODUCTIVE ECONOMY IN LINE WITH THE UAE CENTENNIAL 2071 GOALS?



How can government and business come together to enable better industry collaboration?



What can the UAE government do to help attract and retain the right talent within construction?



How can the UAE government help accelerate innovation in construction?



How can the construction industry ensure that its voice is heard?

ENABLING CLOSER RELATIONSHIPS

Supply chains in the UAE are highly integrated. Contractors are often part of multi-disciplinary holding groups that are adept at delivering multiple aspects of projects simultaneously, at low cost, and can give the buildability advice that consultants and designers often lack. But to gain their insight, clients must engage more actively with the industry.

Parties across the sector lament a lack of pre-project working groups, supplier conferences and general engagement. The average supplier works with many clients, but the top-down nature of the industry means that they are often not given the opportunity to share the lessons learned.

A good example is Dubai's Expo 2020 project team, which has been paying attention to global best practice. Not only has it engaged leading contractors in pre-construction services agreements to strengthen its requirements for major contracts, but it has extensively engaged with the supply chain to ensure that its needs are well understood and its partners are aligned with the ultimate vision. This is a crucial step for the UAE.

Expo 2020 is the first World Expo and the second ever 'mega-event' to secure a procurement excellence award from the Chartered Institute of Procurement & Supply (CIPS).

Developing more long-term frameworks with suppliers could benefit project owners with large programmes of work in the UAE.

PAYMENT CHALLENGE

It is vital for clients in the region who want more productive project teams to pay their supply chains on time.

Payment terms in construction are out of sync with other industries, which typically use 30-day payment terms, and it comes as no surprise that rates of innovation are considerably higher in other sectors.

Contractors and suppliers in construction can wait 120 days for payment, and combined with the imposition of liquidated damages on top of

large retentions sought, cash flow is a serious issue throughout the project supply chain.

Even in the current competitive market, suppliers are examining their relationships with contractors above them in the chain, reducing their payment terms, some to as low as seven days, and rejecting the back-to-back clauses that feature in many contracts in the UAE.

TECHNOLOGY

Regulatory focus on investment in digital technology would smooth collaboration between parties both at the planning stage and execution stage, and improve safety on the jobsite. Within the supply chain, there is also significant scope for the further standardisation of components, as well as the greater use of supply chain management in public sector and government-related entities.

Finally, the construction sector could potentially benefit significantly from improved risk sharing through more balanced contracts between client and contractor, for a more amicable project environment.

AN IDEAL SCENARIO

The aim is to create a collaborative construction ecosystem that enables better risk sharing by all parties involved on a project. From clients to contractors, all stakeholders should feel obliged to deliver better results. This would mean fewer disputes, as risk allocation would be clarified within standardised contracts. Selecting contractors on the basis of their reputation and quality, not only price, would improve the quality of construction projects.



WE CANNOT THINK OF
THE FUTURE WITH THE
TOOLS OF THE PAST”

HOW CAN GOVERNMENT AND BUSINESS COME TOGETHER TO ENABLE BETTER INDUSTRY COLLABORATION?

CHALLENGES	RECOMMENDATIONS
<p>UNBALANCED TERMS</p> <p>Contractors say contracts in the region tend to be unfairly skewed in favour of the project paymaster or project owner, and leave the main contractor exposed to high levels of commercial risk with little recourse available.</p> <p>This results in higher pricing by contractors to cover construction risks, inefficiencies and ultimately greater risk of project failure.</p>	<p>RISK ALLOCATION</p> <p>Introduce and promote standard contracts to ensure more balanced distribution of risk between clients, consultants and contractors. Contracts should seek to share risk among all parties and offer pain/gain opportunities.</p> <p>Include a price adjustment clause in standard contracts to cover risk.</p>
<p>UNFAIR CONTRACTS</p> <p>There is a need to develop more balanced contract terms that allow for a fairer allocation of risk between the project owner/paymaster and the main contractor.</p> <p>A fairer allocation of risk would benefit all stakeholders in the project. It would mean better pricing (see above) and also foster an atmosphere of collaboration.</p>	<p>REGULATORY FRAMEWORK</p> <p>Set clear definitions and understanding of traditionally vague contract terms.</p> <p>Introduce a Construction Contracts Act applying to UAE construction works, codifying payment timeframe, adjudication and certification terms.</p> <p>At present, clients are free to impose conditions due to the highly fragmented and bespoke nature of the industry.</p>
<p>NEW PLAYERS</p> <p>The construction sector is loosely regulated and has low barriers to entry that allow new players to enter the market with few restrictions. This has intensified competition and driven down prices.</p> <p>New players are entering the market even when work is being secured with damagingly low margins. This is a challenge for established players, although project clients have welcomed this as it allows them to secure contractors' services for low prices. There is value to the UAE in having globally recognised construction industry champions in key segments.</p>	<p>LIMITING BIDS</p> <p>Place restrictions on contractors with less experience or a negative track record by judging them on the basis of technical competence to ensure submitted bids focus on best practices and whole-life cost.</p> <p>The current lowest-price-wins model rewards a short-term approach to quality, safety and innovation.</p> <p>Introduce a contractor accreditation scheme that grades contractors in terms of financial strength, and technical and practical capability.</p>

BECOMING AN ATTRACTOR

A more open and efficient construction industry that delivers projects successfully is a more attractive option for young people choosing their careers.

During its heyday a century ago, construction projects involved cutting-edge technology and were able to overcome some of the greatest engineering challenges of their time.

Today that appeal comes from other sectors such as IT and healthcare. Construction is finding it increasingly difficult to attract the best minds, a problem that could be solved by better adoption of technology.

READY FOR DIGITALISATION?

The construction industry is lagging behind other sectors when it comes to investing in digitalisation and research and development (R&D).

Globally, the construction industry is estimated to invest only about 2 per cent of its revenues each year in R&D, significantly less than the 80 per cent levels achieved in other more technology-driven sectors.

As a low-margin business model sector, construction companies find it tougher to put aside funds for R&D, yet despite its laggard status when compared to other industries, construction has been making some moves towards adopting digital technology.

Technology such as building information modelling has made its way into construction processes. However, the technology is not being used as much during the construction stages of projects. In this phase, traditional techniques and methodologies are more entrenched, often due to a lack of skilled professionals.

This may be a regional issue because of its traditional reliance on low-cost, poorly skilled expatriate workers for many of the functions on a construction site. Workers prefer to use traditional techniques that they are familiar with and understand.

OUTSOURCING

Construction firms in the region are typically large, complex organisations that provide a

wide range of services to support their key role of delivering projects.

This is largely a legacy issue because when companies grew in the past, they had to be self-sufficient as service providers were not available in the market to take care of functions such as catering and transport.

Today, as the UAE economy has grown and diversified, many of these functions can be outsourced. By doing so, construction companies can focus on their core competency without the distraction of performing other roles.

Outsourcing also brings in external expertise and talent, as well as innovative ideas from outside the traditional construction ecosystem.

Given that graduates often prefer to work in sectors such as technology and finance that are perceived to offer more interesting careers, this will help reinvigorate an industry that in recent years has struggled to compete with other sectors for the best talent.

AN IDEAL SCENARIO

The goal is to create a supportive and transparent work environment, which understands the value of skilled professionals in creating a successful city. Long-term visas could be provided to individuals of merit: engineers, architects, consultants and so forth. Companies would then invest in talent as they would be able to retain professionals in the longer run.

The industry would become digitally advanced, with an influx of young talent eager to succeed in this thriving industry.



IF WE WANT TO
BE READY FOR
DIGITALISATION, WE
NEED NEW TALENT”

WHAT CAN THE UAE GOVERNMENT DO TO ATTRACT AND RETAIN THE RIGHT TALENT WITHIN CONSTRUCTION?

CHALLENGES	RECOMMENDATIONS
<p>SHORT-TERM VISAS Given the transient nature of work in the UAE and with visas dependent on project contract duration, construction firms are hesitant to invest in long-term talent development. Employees leave the country once a project is complete, which means investing in skills development brings no long-term benefits.</p>	<p>VISAS BASED ON SKILLS Grant permanent and semi-permanent visas for professionals on the basis of experience and not just academic qualification. Establish a regulated business for manpower hiring and impose high skills.</p>
<p>PIPELINE UNCERTAINTY The cyclical nature of the economy means there is a lack of visibility when it comes to the project pipeline, and it is difficult for companies to invest in required resources and plan ahead of time for their staff.</p>	<p>FUTURE PROJECT TRANSPARENCY Provide a transparent pipeline of future projects, allowing contractors to counter the transient nature of construction contracts and better plan for their staff. Coordinate timing of government and government-related entity (GRE) projects to ensure countercyclical spending.</p>
<p>LACK OF STRUCTURED TRAINING The UAE lacks training institutes for the ongoing development of professional workers. The focus is on hiring based on academic qualifications, not skills. Furthermore, there is no unified accreditation body for engineers.</p>	<p>ESTABLISH PROFESSIONAL BODIES Establish professional development bodies for technical workers and a unified accreditation committee for built environment professionals. Work with renowned international bodies such as the UK's Institution of Civil Engineers (ICE) and others.</p>
<p>LACK OF INDUSTRY APPEAL With an increasing technology appeal in sectors such as IT and healthcare, construction is finding it increasingly difficult to attract the best talent. A technology-driven and efficient construction industry that delivers projects successfully would be more attractive to young people.</p>	<p>SUPPORT INDUSTRY RECRUITMENT Support graduate recruitment programmes in partnership with industry players to overcome the challenges of losing younger talent to more lucrative professions.</p>

ENABLING NEW APPROACHES

New technologies for construction fall into three broad categories: onsite construction; office-based; and collaboration.

For construction work onsite, technologies include 3D printing, autonomous vehicles and robotics. In the office, there are technology solutions for portfolio management, virtual reality, automated design and new enhancements to BIM. For collaboration, technologies are helping to improve teamwork and customer management. But while other industries invest a significant percentage of revenues in research and development (R&D), construction lags behind. Most companies are low-margin businesses, often with little or no R&D budget.

Performance gains achieved in the past have often been made without developing any intellectual property (IP) that can be patented and monetised. Instead, the construction industry's IP is the knowledge held by staff within the industry.

The burden of R&D could be shouldered by organisations that are better positioned to take it on, such as research departments at academic institutions and start-up companies. Both of these can be enhanced with government funding and grants

A NEW APPROACH.

While there is always the possibility of developing a revolutionary new product or technique for the construction industry, the most likely advancements are expected to be made by adapting existing technologies that are already proven to work.

Using additive manufacturing or 3D printing for an entire building may be decades away from being commercially viable, but useful applications have shown results. These include 3D-printed mock-ups for easy review.

Aerial drones have allowed improved surveillance of project sites, while refining the frequency and quality of data obtained.

IMPROVED PROCESSES

Machines and equipment can use the internet of things to communicate when maintenance

and repairs are needed and artificial intelligence (AI) can perform repetitive chores, leaving workers free to do more complex jobs.

While AI can perform some tasks, it may not be as useful in construction as other sectors. Construction projects involve building bespoke solutions for clients, leaving no exact precedent or logic for AI.

Without this precedent, AI will only be able to identify where mistakes have been made once the work has been completed.

Blockchain codes can be used to speed up processes that require a lot of approvals and validations, such as design drawings. Blockchain could be used to check the latest version of drawings against previous versions so that manual checking is only needed when updates or changes have been made.

AN IDEAL SCENARIO

The ultimate aim is for the construction industry to no longer be regarded as a laggard when it comes to innovation. Future construction projects should act as digital playgrounds and testbeds for innovation, with technology treated as necessary for improving productivity and efficiency, rather than a cost burden.

All stakeholders in the value chain will want to be a part of these innovative changes, and the research centres and labs developed by companies, academia and government to trial technologies will benefit the whole industry.



YOU NEED PEOPLE WHO
ARE COMMITTED TO THE
ADVANCEMENT OF THE
COUNTRY—THEY SHOULD
BE AWARDED”

HOW CAN THE UAE GOVERNMENT ACCELERATE INNOVATION IN CONSTRUCTION?

CHALLENGES	RECOMMENDATIONS
<p>ATTITUDE TOWARDS INNOVATION Contractors need bigger profit margins to invest in innovation. And they need client permissions.</p> <p>The focus on cost rather than value limits the amount of innovation a contractor can deploy for a project. If the cost of innovation does not sit in the budget, the contractor stands the risk of either losing a bid in the tender stage, or overrunning cost margins in the project stage.</p>	<p>INCENTIVISE Introduce incentive schemes to reward companies that choose to deploy new technology on their projects. This will ultimately boost the image of the country and support the development of local supply chains.</p>
<p>LIMITING LEGISLATION While there is awareness of many new technologies in the market, contractors and clients alike are hesitant to innovate due to the lack of complementary legislation. Companies that run ahead of the law with technology are at risk of penalties in the future. This means the industry misses out on vital opportunities to engage with technology.</p>	<p>REGULATIONS Establish regulations concerning emerging technologies such as robotics and artificial intelligence. Only then will companies be able to openly test them on sites.</p>
<p>DIFFERING APPROACHES Some companies are unable to deploy new technology because their project partners do not have the budget or same interest in using the technology. This creates obstacles for all players attempting to moving ahead.</p> <p>There is also the issue of general specifications used across most projects, creating conflicts and disturbing the project's execution in a bespoke industry.</p>	<p>STANDARDISATION Specify common standards for technology and data to harmonise processes across all sectors and authorities. Set bare minimum technology requirement to ensure all stakeholders are on the same level of implementation and compliance.</p>
<p>REPLICATION OF IDEAS Contractors that incorporate new technological solutions and innovation into their tender bids often find that their ideas have been replicated for a much cheaper cost.</p>	<p>PATENTS Institute a patent system for innovative methods deployed by a contractor. Offsite manufacturing can also help a contractor retain full control over the design of its solution.</p>

REPRESENTING AN INDUSTRY

The downturn in the GCC's construction sector since 2015 has exposed the construction supply chain to increased business risks resulting from delayed payments, disputes with clients and wafer-thin profit margins due to increased competition.

The impact of this is a potentially serious loss of investment and skills that could undermine the quality and delivery of projects in the region and set it back against its competitors.

STRAINED RELATIONSHIPS

Many of these problems have, at their root, the lopsided contractual relationship between clients and contractors that characterises the construction industry.

The client holds all the cards and typically tends to see getting the lowest price for a project as its primary objective.

The contractor, meanwhile, is required to pitch for work against competitors on a lowest-price-wins basis, as well as being expected to carry almost all the project risk through the construction period. Its only scope for recourse is through claims for design variations made after the contract is signed, thus exacerbating the adversarial approach instilled by clients.

This toxic mixture has endured because the majority of construction clients are irregular, or even one-off project sponsors with no long-term interest in the industry. The relatively low barriers to entry for contractors foster cut-throat tender bids in order to win work.

BRINGING IN CHANGE

Industry-wide changes can be implemented through constant dialogue between the government and construction stakeholders. Spear-headed by a regulated body, strategic initiatives can be introduced in construction procurement and project delivery through increased regulation of procurement, particularly in the public sector. This will allow greater use of a range of beneficial project management concepts.

From a bidding perspective, these include the replacement of the dependence on low-

est-price-wins tendering with requirement for technical assessment of build, and the closer integration of design and construction through earlier involvement of contractors or design and build contracts.

AN IDEAL SCENARIO

In an ideal future, a Construction Industry Development Board would act as the 'middle man' for the industry and government. The board would consist of a group of industry leaders representing industry interests and empowered to speak with the authorities to convey feedback, grievances and suggestions for the development of the construction industry.

New legislation introduced after thorough discussions with industry representatives would benefit all parties.

Furthermore, new regulations would require all designs to be completed and approved by a regulating entity before being tendered, addressing disputes that arise from projects that have begun construction without complete designs.



WE SHOULD NOT UNDERPLAY THE ROLE OF ACADEMIA IN INFLUENCING POLICIES”



WE COULD LAUNCH A UAE CONSTRUCTION BLOCKCHAIN CONSORTIUM TO INCREASE TRANSPARENCY”

HOW CAN THE CONSTRUCTION INDUSTRY ENSURE THAT ITS VOICE IS HEARD?

CHALLENGES	RECOMMENDATIONS
<p>INDUSTRY REPRESENTATION There is a lack of official industry representation by contractors and related parties at a government level. The construction industry stakeholders are unable to jointly present their grievances to the government.</p> <p>In an industry plagued by disputes and payment delays, efficiency in dispute resolutions is necessary.</p>	<p>DEVELOPMENT AUTHORITY A Construction Industry Development Board would encourage continuous dialogue between the industry and authorities. This board could help set standards and regulations, while also addressing disputes and other legal matters. It could also monitor projects that generate a greater number of disputes and investigate the reasons for this.</p>
<p>PROFESSIONAL TRAINING Training institutes focus on developing vocational skills of labourers. There is a lack of training centres for developing managerial-level professionals and highly skilled talent.</p>	<p>PROFESSIONAL DEVELOPMENT Create relevant accreditation bodies to help guide workers on the training needed to secure relevant job positions in the construction market.</p> <p>Work with established international bodies such as the Royal Institute of British Architects (RIBA), Institution of Civil Engineers (ICE) and Construction Industry Training Board (CITB) in the UK and others. Develop a curriculum for graduate continuous professional development (CPD) in construction.</p>
<p>CONTRACTOR ASSOCIATIONS Existing contractor associations in the UAE hold little or no real authority within the construction industry. Other markets have active contractor associations that help look out for the industry's interests.</p>	<p>MORE AUTHORITY Establish a more active association that engages with government and project clients, and helps regulate industry and maintains standards.</p> <p>Award more authority to the association, enabling it to better monitor stakeholders – for instance calling out contractors with a history of project delivery issues.</p>

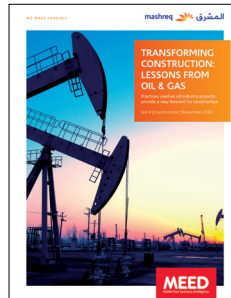
MEED MASHREQ CONSTRUCTION PARTNERSHIP

Over the past two years, the MEED Mashreq Construction Partnership has produced a valuable industry resource bank, with insights from experts and thought leaders from around the world.



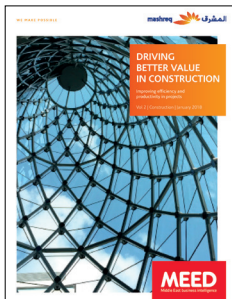
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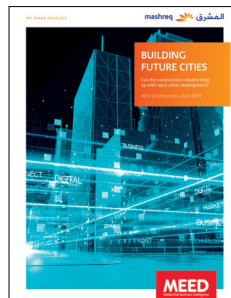
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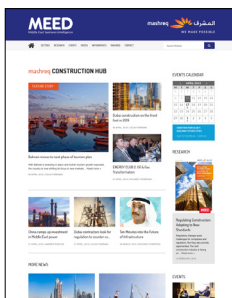
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Mashreq Construction Clubs

Regular networking and industry discussions with executives from the construction sector to discuss challenges and trends in various construction segments.

