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**Has the industry turned
the corner?**

Deloitte GCC Powers
of Construction 2018

Foreword

Welcome to the ninth edition of Deloitte's *GCC Powers of Construction* report. With 2018 seeing a decline in project awards to US\$97bn, we consider whether the industry has turned the corner in a series of articles that review the current market conditions, reflect on how the industry could benefit from positive change, and share perspectives on the smart development of tomorrow's cities. We hope you'll find this year's selection of articles interesting and insightful.

It seems paradoxical that the same markets that welcome innovation and change – and have significant planned investments in exciting new capital projects – still have a long way to go to embrace novel approaches to construction delivery, and overcome the familiar challenges that adversely affect project performance.

Delivering the GCC states' ambitious national visions demands a more sophisticated contracting environment. Market participants are eager to see positive change in the industry – not least through more-balanced contractual relationships; greater stakeholder collaboration focused on delivery; a sensible approach to risk allocation; quicker ways to resolve disputes; innovative delivery models; and the adoption of global standards that will prove attractive to international project financiers and investors.

Moving forward, private sector capital is expected to play a bigger role in the industry – whether through PPPs or fully private projects – but will demand fairer contracting practices and solutions to prolonged payment periods.

A highly competitive and price-conscious market over the past few years has unfortunately led to a 'lowest bid wins' model that has seen price as the deciding factor for awards. When you have choice in a highly competitive market, you can demand quality and the lowest price, but this is not a sustainable approach for contractors or developers. Pressure to reduce costs to win work often results in frequent disputes, and leads to eroded profit margins, which ultimately affects project delivery.

As developers look for ways to build assets at a cost that's recoverable through an acceptable ROI, there has to be more focus on the whole-life cost rather than just the initial capital cost. This paradigm shift will drive the change required in terms and conditions and a collaborative approach between stakeholders.

Changing the contracting environment to have a more balanced approach to risks and rewards will not only make pricing more sensible, it will also enable more efficient and effective delivery of large capital projects for owners. This shift will not be easy, and requires the commitment of everybody in the industry, but it has the potential to be hugely beneficial and rewarding for all involved.

Cynthia Corby, Audit Partner and Construction Leader, Deloitte Middle East

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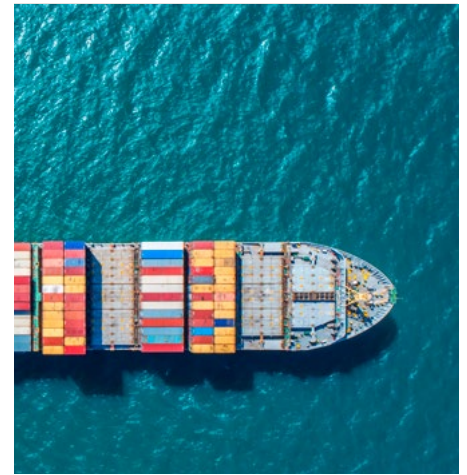
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The GCC projects market outlook

There is no doubt that it has been a tough few years for the GCC construction industry. The 50 percent-plus fall in oil prices since 2014 has resulted in lower government revenues and a decline in spending on new projects. In all, the market is about a third smaller in terms of new contract activity than it was at its peak between 2013 and 2015.

This fall in project investment has served to remind regional governments of the pressing need to reform their development models, continue their economic diversification, and focus on transforming their economies to become less dependent on crude.

Examples of the authorities' response to the worsening economic climate include the introduction of VAT in Saudi Arabia and the UAE in early 2018 to diversify revenue streams, the adoption of steadily increasing in-country value regulations for major projects, more stringent localisation targets, and initiatives to encourage and increase foreign direct investment.

As the GCC states have grappled with the economic challenge, initiatives such as the Saudi Vision 2030, Abu Dhabi Economic Vision 2030, Dubai Plan 2021 and Qatar National Vision 2030 have formed the foundations of national reform plans and strategies. Most of the major project announcements over the past three years – such as Neom and Qiddiya in Saudi Arabia, the petrochemicals diversification programme in Abu Dhabi and the development of the Duqm industrial hub in Oman – sit within the framework set out in these national visions.

Yet despite the reforms and changes implemented in recent years, it is clear that there is still some way to go before countries can claim to have achieved their objectives. Although the oil price averaged more than US\$70 a barrel in 2018 compared with just US\$52 a barrel in 2017 and US\$41 a barrel in 2016, spending on

projects continued to fall; just US\$97 billion worth of contracts were awarded last year compared with US\$124 billion and US\$116 billion in 2017 and 2016 respectively, according to MEED Projects (www.MEEDProjects.com). That makes 2018 the worst year in terms of contract awards since 2004.

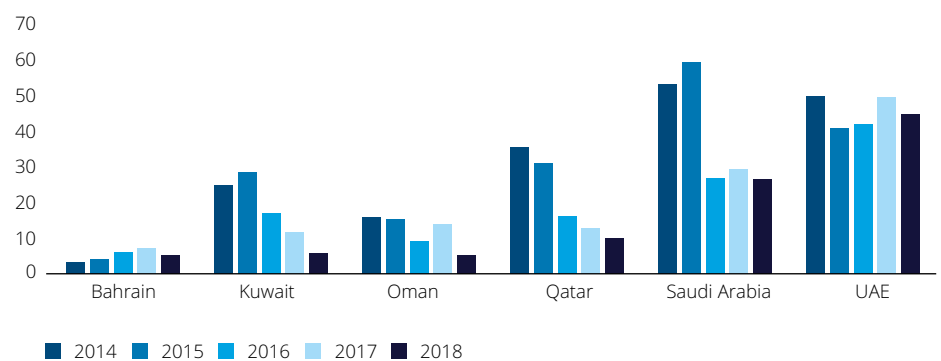
All six GCC states saw a decline in the value of new deals. The UAE remains the largest individual projects market, with US\$44.5 billion of new contracts last year – a fall of just under US\$5 billion on 2017. Saudi Arabia, traditionally the largest and most diverse of the region's projects markets, declined by a little under US\$3 billion to US\$26.4 billion. Qatar slipped by US\$2.7 billion to just over US\$10 billion, while Kuwait and Oman both experienced a more than 50 percent

fall in deals let to just US\$5.6 billion and US\$5.1 billion respectively.

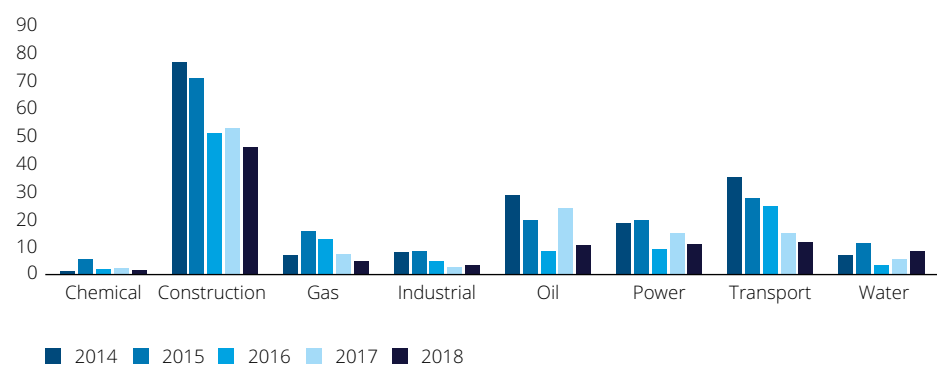
It was a similarly gloomy picture from a sector perspective. With the exception of water, all key project sectors recorded a lower total value of awards year-on-year. Some US\$45.8 billion of contracts were signed in the construction sector in 2018 compared with US\$76.6 billion in 2014. In transport it was even worse, with the sector having declined by more than two-thirds over the past five years, from US\$35.2 billion in 2014 to just US\$11.8 billion last year.

The 2018 data may seem paradoxical – after all, if oil prices rose and government revenues increased last year, why would project spending decline?

Value of GCC contract awards by country, 2014-18 (\$bn)



Value of GCC contract awards by sector, 2014-18 (\$bn)



Source: MEED Projects

There is no one simple answer to this complex problem. First, analysis of historical data highlights that it takes at least 18 months for rises (or falls) in the oil price to have an impact on overall project spending levels. This is demonstrated as recently as 2015, when crude was already well on the way down, but contract awards hit a near record high of US\$178 billion. It was not until 2016 – some 18 months after oil prices started falling – that project activity substantially declined.

Project budgets are often signed-off well before revenues tighten. Conversely, it takes time for increased revenues to translate into budgetary decisions on new projects. A positive implication of this is that the steady rise in oil prices over the past year should result in greater project activity in 2019.

The lack of growth in the private sector's role in the development of projects across the region has been another impediment to the market's performance. Dubai has consistently shown that it is possible for a projects market to be sustained by private or quasi-private entities that are not dependent on government financing. But there has been little progress made in reforming the procurement and project development ecosystem to delink organisations from the government, or create self-funding companies.

That this is critical to the long-term health of the region's projects market is underscored by Dubai's recent performance. The emirate is the only major hub to have grown in terms of project activity over the past three years, thanks to the self-dependence of its key real estate developers, such as Emaar, Nakheel, Meeras and Wasl. As government-related entities with their own income streams from their hotel and retail developments, in addition to off-plan sales, the oil price becomes somewhat irrelevant.

Higher budgetary expenditure does not necessarily lead to greater project spending; after all, 2018 budgets were also up on the previous year. But it is indicative of a general trend that will offer encouragement to the beleaguered projects market supply chain.

The fact that hydrocarbons-poor Dubai was compelled many years back to diversify its economy will not be lost on the region's other economies. Yet, while many of these neighbours would no doubt want to emulate how Dubai has evolved its projects market, it is no easy task.

Similarly, there has been much discussion about public-private partnership (PPP) models as a means of harnessing the private sector to finance and build schemes. However, aside from the power and utility sector, the region has been unable to successfully get most PPP projects off the drawing board. Uncertainty around demand, underdeveloped regulations and an insufficient allocation of risks are all touted as some of main reasons why the PPP model has failed to take off.

The decline in project market spending has also been compounded by specific localised issues unique to some states. Kuwait, for example, sometimes faces political rather than financial barriers to project development. Qatar, which will host the 2022 FIFA World Cup, has been more focused on project delivery in preparation for the event rather than on building new infrastructure.

Regardless of the underlying reasons for the market decline in the past three years, the industry is hopeful that 2019 will herald an improvement in its fortunes. Initial signs are positive: Riyadh announced a record US\$295 billion 2019 budget in late December on the back of higher project oil earnings; the UAE's federal budget is also the highest ever set – growing 17 percent to more than US\$16 billion; and Oman's expenditures are set to increase by more than 3 percent to US\$33.5 billion.

Of course, higher budgetary expenditure does not necessarily lead to greater project spending; after all, 2018 budgets were also up on the previous year. But it is indicative of a general trend that will offer encouragement to the beleaguered projects market supply chain.

Equally encouraging is the robust projects pipeline. There are currently more than US\$2.5 trillion worth of planned or unawarded projects in the GCC. The biggest market by a large margin is Saudi Arabia, with more than US\$1.2 trillion worth of future work, followed by the UAE at US\$716 billion worth of planned projects. The other markets range from US\$60 billion for Bahrain up to US\$215 billion in the case of Kuwait. 

Naturally, not all of these many thousands of future projects will end up proceeding. But it is interesting to note that the slowdown of recent years is very unlike the projects slump of 2009–12. Back then, hundreds of billions of dollars of schemes – especially those in the real estate sector – were cancelled outright. While projects today have undoubtedly been delayed, they are still very much alive. This is because, unlike the off-plan, speculation-driven investment frenzy of 2006–08, today’s pipeline is built on more solid commercial foundations and an inherent demographic and economic need. This in itself creates a degree of confidence in the market outlook.

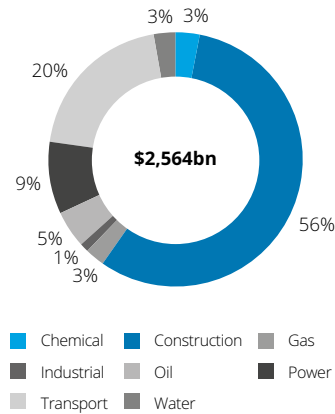
A sense of this can be found in some of the major projects due to be awarded in the year ahead. In Kuwait, the focus will be on the estimated US\$5 billion Al-Zour integrated petrochemical complex. There will also be hope that the state can finally progress the first projects on its long-awaited PPP programme by awarding the Umm al-Hayman wastewater treatment plant, the Kabd waste-to-energy scheme, and the Al-Zour North Phase II and III IWPP.

As the largest economy and population in the GCC, expectations for the Saudi market are high. The kingdom has underperformed in the past three years, but has an enormous pipeline of projects that have the potential of going ahead in 2019.

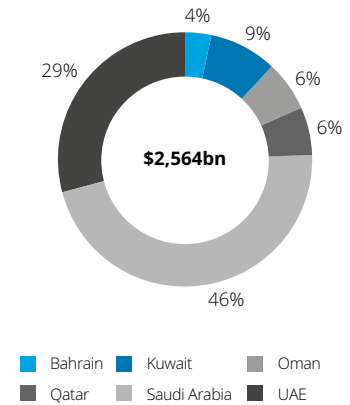
They include at least half a dozen new desalination plants, both on a PPP and EPC basis, some 3.1GW of new solar and wind schemes under the Renewable Energy Project Development Office (Repdo) renewables programme, the US\$10 billion-plus Saudi Landbridge railway linking Riyadh and Jeddah, and dozens of new affordable housing projects across the kingdom as part of the US\$50 billion housing programme.

The fast-track development Neom, the US\$500 billion self-styled ‘gigaproject’, will be a key component of project activity

Projects pipeline in the GCC, by industry, as of January 2019 (\$bn)



Projects pipeline in the GCC, by country, as of January 2019 (\$bn)



in 2019, as will other, smaller but still significant tourism and leisure projects under the 2030 Vision, such as Qiddiya and the Red Sea tourism development.

In Bahrain, the smallest of the GCC’s projects markets, all eyes are on the development of the estimated US\$8 billion King Hamad Causeway – a road and rail link connecting the island kingdom with Saudi Arabia. Likely to be implemented on a PPP basis, the project has attracted strong interest from the private sector, with more than 80 potential investors attending a project meeting last year.

Nearby in Qatar, the focus is on getting ready for the 2022 FIFA World Cup. Procurement over the past 18 months has therefore generally been limited to contracts that can be completed in time for the event. Nonetheless, with further extensions to the metro network planned, along with the rollout of EPC contracts on the long-awaited LNG expansion programme, the state is expected to maintain a steady flow of new projects for the foreseeable future.

All focus in Oman is on the ongoing development of the Duqm industrial hub. The central component of the project is the new US\$5 billion-plus grassroots refinery, which is now under way. Following a raft of announcements from foreign investors,

a number of major industrial schemes are planned in the logistics and petroleum hub that are set to transform the Sultanate’s economy.

Finally, in the UAE, now the GCC’s largest single projects market, 2019 is set to be a pivotal twelve months. After a few slow years, Abu Dhabi is becoming a more active market. Major anticipated project developments include a new US\$15 billion-plus refinery, the multi-billion-dollar expansion of the Borouge 4 petrochemical complex, and Adnoc’s US\$3 billion gasoline and aromatics project. On the civil construction side, there may well be an announcement on the revival of the long-awaited metro project and the iconic museum projects at the Saadiyat Island cultural district. The coming months will also likely see the main contract awards on the Etihad Rail scheme linking Abu Dhabi with Dubai, Sharjah and Fujairah.

As the largest single projects hub in the region, there is always a focus on the Dubai market. With real estate prices showing no sign of recovery, there is a natural concern that fewer residential projects will come to tender. The emphasis therefore will likely be on government-funded infrastructure projects such as the estimated US\$2.7 billion substructure contract for Concourse 1 of the new Al-Maktoum

International Airport, the US\$2 billion-plus Deira and Bur Dubai strategic sewerage programme, and the planned extensions of the Dubai metro's Red and Green Lines, all of which are scheduled to be awarded over the coming 12 months.

Despite its current woes, the real estate sector is still expected to provide a healthy conveyor belt of projects. Dubai Harbour, Dubai Creek Harbour, Wasl Gate, Deira Islands, Dubai Hills and Meydan, among others, will be the sites of a number of new, significant residential projects as the emirate's key developers release more property into the market.

By and large, it is difficult in the short term to envisage a return to the US\$175 billion–180 billion a year worth of contract awards in the GCC last seen in the 2014–15 period. Although oil prices have risen, it appears more cautious capital infrastructure spending is now the norm. On balance, the market looks likely to continue at around the US\$120 billion mark for at least the next two years.

The tightening pipeline of work is not the only challenge facing the projects supply chain. The industry is itself being transformed by new technologies such as building information modelling (BIM), digitisation, 3D printing, blockchain and drones. These disruptors create an additional dimension to how companies operate. Going forward, it will not necessarily be how successful firms are at winning project work and maintaining their pipeline of opportunities, it may also be how effectively they integrate and keep pace with technological change in an industry that has traditionally been reluctant to embrace it. ●

by **Ed James**, Director of Content & Analysis at MEED Projects

Going forward, it will not necessarily be how successful firms are at winning project work and maintaining their pipeline of opportunities, it may also be how effectively they integrate and keep pace with technological change in an industry that has traditionally been reluctant to embrace it.

Real estate and construction cycles – where are we?

Across the UAE, real estate market prices are in decline, with apartment sales in Abu Dhabi down by approximately 8 percent, and in Dubai by circa 6 percent¹. The residential sales price index for Dubai last peaked in October 2014 at 297.5, and has been on a steady decline since². The index reached 228.5 as of December 2018.

Deloitte's 2018 *Real Estate Predictions* survey revealed that 77 percent of respondents believe Dubai's real estate market will perform worse in 2019 compared to 2018³.

Although the key metrics for the UAE's real estate markets have been in decline, the construction sector has more recently witnessed a marked increase in pricing, with an increase of circa 3 percent in average costs from 2017 to 2018⁴.

What does this mean for investors?

Our work with real estate investors indicates a risk appetite for development returns ranging from 12 to 15 percent, with a higher multiple for equity returns. Savvy investors generally assess fundamentals on a project-by-project basis, focusing chiefly on the development yield and whether the scheme can support a credible case for finance.

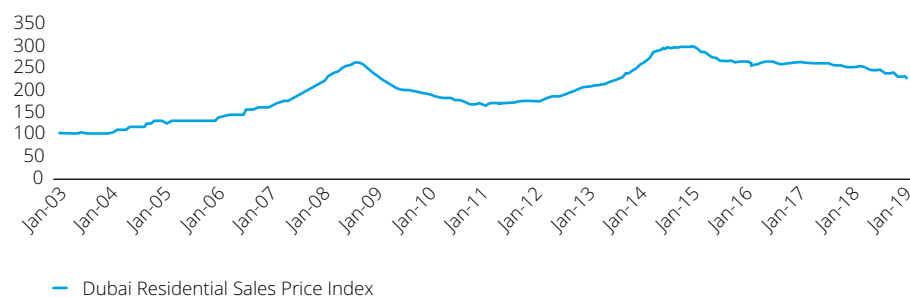
The compressed delta between revenues and construction costs is increasingly putting pressure on margins and the ability to repay banks and investors. This makes robust market and financial feasibility advice even more essential. What's more, many investors are seeking more creative avenues to fund projects, such as the deferment of land and infrastructure costs through joint venture partnerships, or by working with government – PPP structures are likely to continue to be a fixture of the market in the coming years.

Future market opportunities

The UAE market is characterised by the influence of other global economies. It continues to innovate and mature, with the following three trends seen as market disruptors that may present future opportunities across the region.

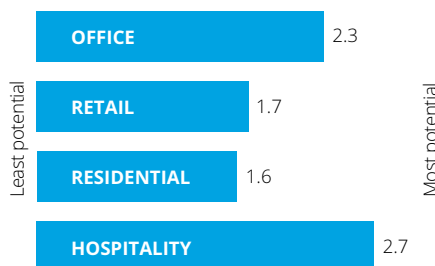
Many investors are seeking more creative avenues to fund projects, such as the deferment of land and infrastructure costs through joint venture partnerships, or by working with government – PPP structures are likely to continue to be a fixture of the market in the coming years.

Residential sales price index for Dubai, 2003 to 2018



2019 results

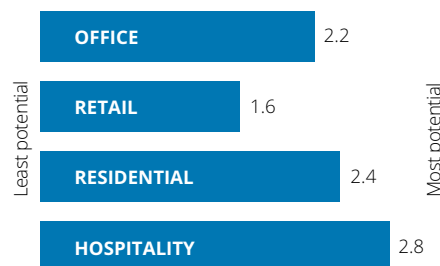
Q: Which asset class in Dubai has the most potential in 2019?



Note: Score from 1-5 with 1 being the worst and 5 being the best

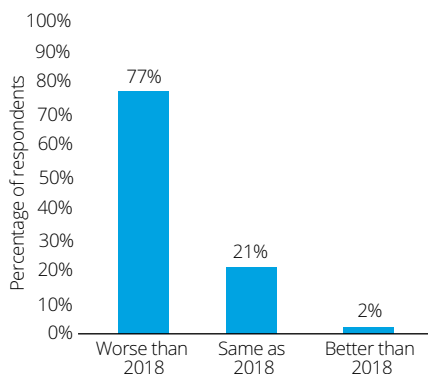
2018 results

Q: Which asset class in Dubai has the most potential in 2018?

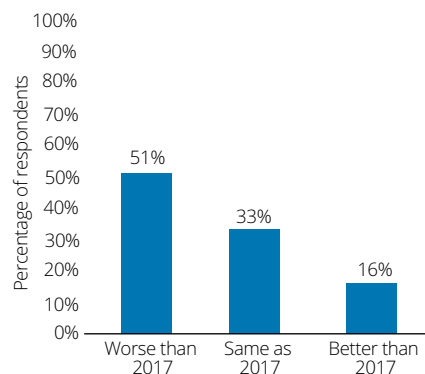


Note: Score from 1-5 with 1 being the worst and 5 being the best

Q: How will Dubai's real estate market perform in 2019?



Q: How will Dubai's real estate market perform in 2018?



1. Flexible workspace

From 7,800 co-working locations in 2015, it is estimated that there are now 17,700 locations globally, and that there will be 30,000 locations by 2022. This represents a CAGR of 31 percent⁵.

Over the past few years, co-working has begun to take root the UAE, with the launch of AstroLabs, Emaar’s e25, Our Space, 1776, Servcorp’s Level 41, Dtech, A4 Space, Youth x Hub, DIFC’s Fintech Hub and Tecom’s In5, amongst others. There are over 55 flexible office locations in Dubai, but they currently represent less than 1 percent of Dubai’s office stock. In the US, there are significantly more co-working operations, with occupancy reflecting approximately 2 percent of office stock in key cities, and in the UK, Cushman & Wakefield estimates that flexible workplace providers already occupy some 4 percent of Central London office space⁶.

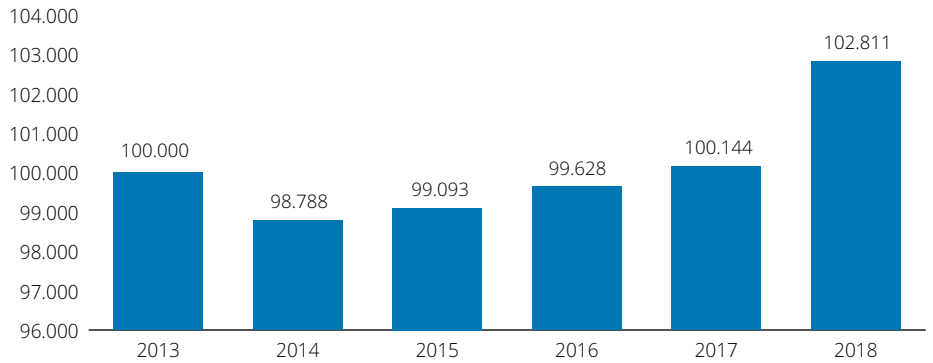
A key attraction of co-working space is the initial capital expenditure and time saving when compared to conventional space. Co-working occupiers can ‘plug and play’ without having to worry about fit out and furniture costs, broker fees and utilities, to name but a few. Based on our analysis as of Q4 2018, co-working space can be up to 50 percent more cost effective than conventional space for up to 10 staff on a one-year term.

2. More affordable hospitality stock

In the context of economic uncertainty from key source markets, leisure travellers to the UAE are becoming increasingly price sensitive. This has led to the midscale segment in the UAE seeing significant growth in supply in both international and local brands, such as the Rove by Emaar and Zabeel House by Jumeirah.

Midscale hotels are expected to exert pricing pressure on other segments as they seek to provide a quality experience and value for money, but may offer a way for investors to protect potential returns. During construction, midscale hotels typically offer 35 percent savings on hard costs and FF&E compared to higher-end product. Midscale hotels also do not

UAE Highrise Residential Input Price Index



typically occupy prime locations, and are usually compact higher-density projects requiring less investment in land.

But, as is key with all hospitality projects, a solid business case, concept and hospitality experience are all prerequisites for a successful investment.

3. Retail that embraces Digital

Digital disruptors within the retail sector provide opportunities for brands to grow their relationships with consumers. Some of the most successful retailers are those embracing a multi-channel presence that combines bricks and mortar with the consumer’s online experience. More than one-third of shoppers say they research a product online whilst in a store, and studies show that those using a digital device in-store⁷ are more likely to make a purchase⁸.

Vast amounts of data are being collected by leading brands. Artificial intelligence (AI), machine learning, and augmented and virtual reality are creating new ways for brands to engage with their consumers. The Deloitte Digital Democracy Survey identified that for 50 percent of millennials, social media advertising had a medium or high influence on their buying decisions⁹.

In 2018, Deloitte Digital and Salesforce undertook a survey of more than 500 traditional retail, pure play, consumer goods and branded manufacturing leaders from around the world¹⁰. The brands considered as elite performers (with over

10 percent revenue growth in the previous fiscal year) were 1.9 times more likely to quickly respond to demands and insights identified within consumer data than brands with flat or decreasing revenue. The survey also found that although only one-third of brands had adopted AI, the most prevalent use (40 percent) is to tailor pricing and promotions in real time.

The results demonstrate that in the context of macroeconomic challenges, there are still possibilities for retailers to grow revenues by embracing digital technology and creating an omnichannel offer within which bricks and mortar continues to be essential. ●

Oliver Morgan, Director, Development Strategy & Investment, Deloitte Middle East

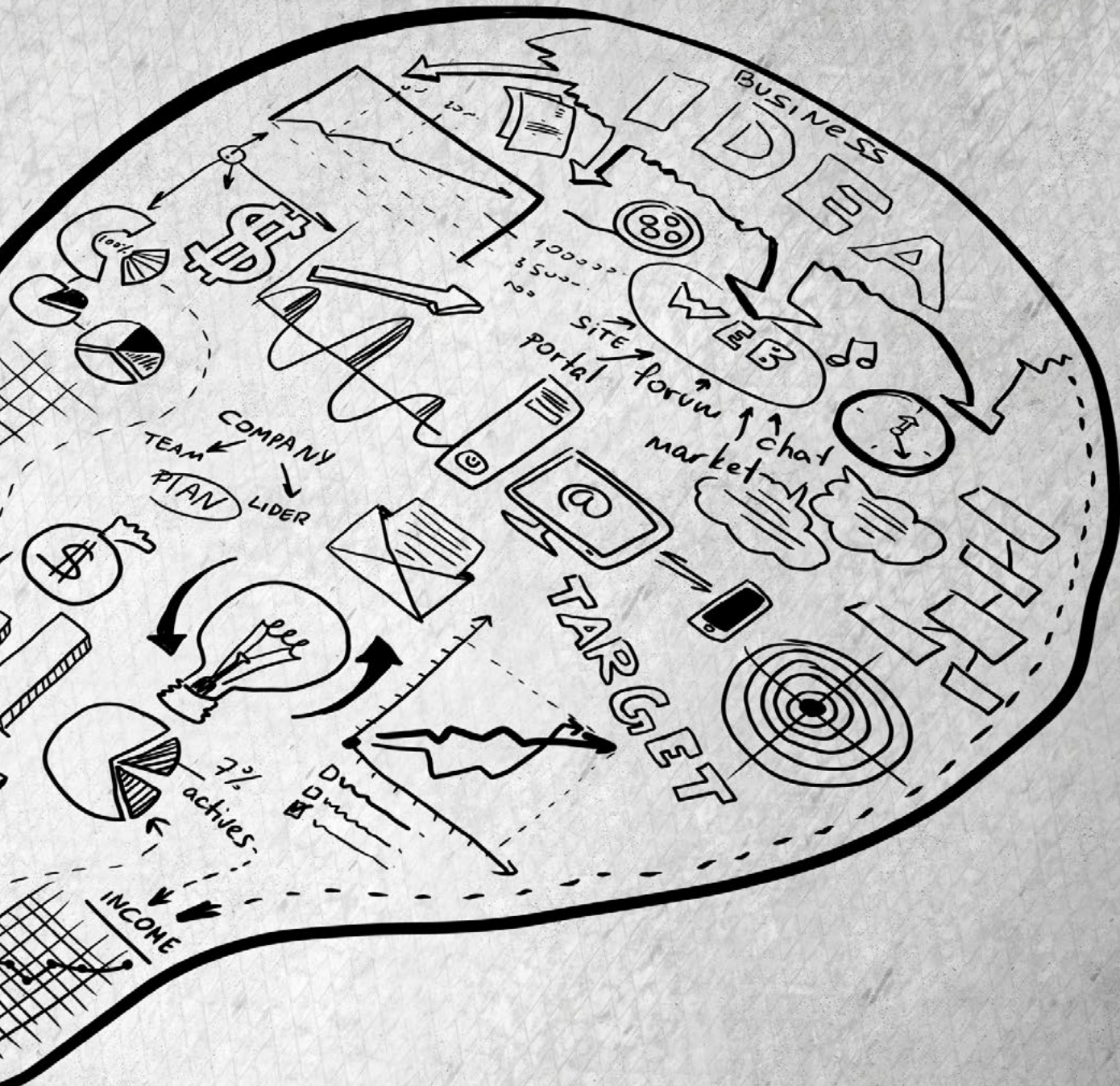
Emil Rademeyer, Managing Director at Oracus

Endnotes

1. Reidin, 2017 vs 2018 YOY average sales prices.
2. Reidin, Dubai Residential Sales Index, Base Year = January 2003 (100)
3. Deloitte Dubai Real Estate Predictions 2019, a survey of 60 leading investors and developers
4. Oracus.pro
5. Global Coworking Forecast December 2017, GCUC, Emergent Research
6. Coworking 2018, Cushman & Wakefield
7. Salesforce 2017 Connected Shoppers Report
8. Kasey Lobaugh, Jeff Simpson, and Lokesh Ohri, Navigating the new digital divide
9. Gerald Belson, Kevin Westcott, and Scott Lippstreu, Deloitte Digital Democracy survey
10. Consumer Experience in the Retail Renaissance, Deloitte Digital and Salesforce

Construction C-Suite survey





Deloitte recently conducted a survey of chief executives and chief financial officers from the GCC construction industry. The survey gained insights into market sentiments on a range of issues affecting construction across the region, building on similar surveys in 2015 and 2016.

Optimism seems to have increased, with 56 percent of respondents being more optimistic about their future prospects relative to the past 12 months.

Consistent with previous years, the results indicated the key external drivers are the global and local economy, increased competition, and increased pressure on liquidity.

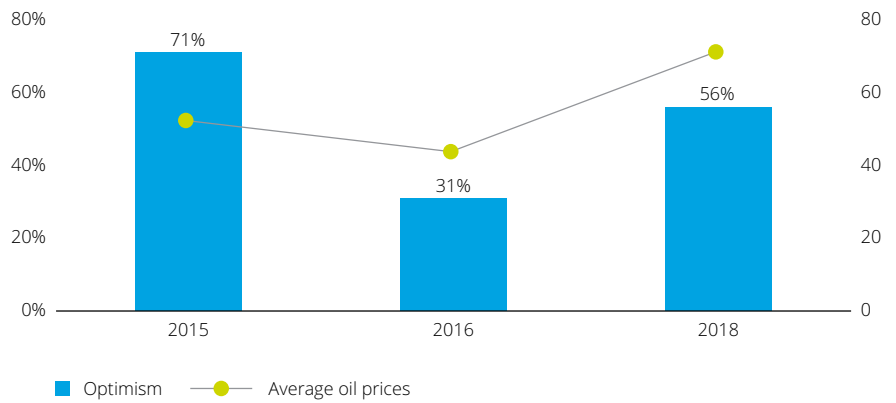
The following is a summary of the key findings.

Is optimism returning?

It remains a challenging time for many contractors. The slow oil price recovery continues to affect the award of public sector construction projects in many markets. Similarly, the private sector has continued to be cautious with new construction awards in light of economic and geopolitical challenges, which has resulted in feasibility studies and financing options coming under pressure.

That said, optimism seems to have increased, with 56 percent of respondents being more optimistic about their future prospects relative to the past 12 months, with hopes that the improvement in oil prices will improve consumer confidence and spending. This compares with 31 percent of respondents in 2016 who were more optimistic about the future, and 71 percent in 2015.

Percent of respondents optimistic about future financial prospects correlated to average oil prices (in US dollars per barrel)

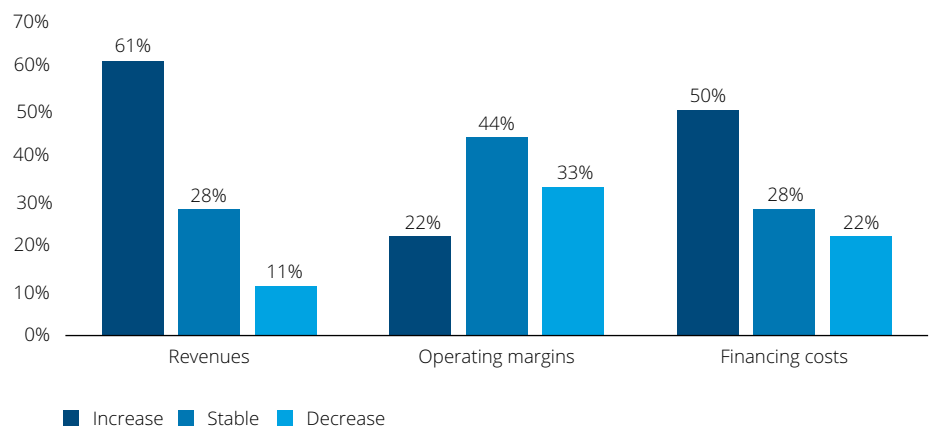


Industry performance over the next 12 months

Increased optimism among industry executives appears to stem primarily from their projected increases in revenue. Sixty-one percent of respondents are expecting an increase in their company's revenue in the next 12 months. However, this optimism appears to be limited to revenue growth, as the majority of the respondents (77 percent) believe that operating margins will either be stable or negatively impacted in the coming year.

The survey responses also indicate that the general market sentiment on finance costs has worsened, with 50 percent of respondents expecting them to increase in the next 12 months. We explore this further below.

Views of respondents on likely changes in financial metrics of their company over the next 12 months



Are contractors indirectly funding the projects?

The findings suggest the increased demand for financing in the construction industry is due to contractors indirectly having to fund projects while they wait for payment. The problem is caused by extended payment terms; 76 percent of respondents believe there is greater pressure on contractors to accept delayed payment as developers experience funding pressure in their projects. This has a knock-on effect on the supply chain.

We asked the respondents about the average time for conversion of ‘work done (WIP) to receivables’ and the average ‘collection time of the receivables’ once certified. Computing the average working capital cycle, we identified that on average it takes **75 days** longer than in 2016 to receive payments for the work done (2018: 243 days; 2016: 168 days).

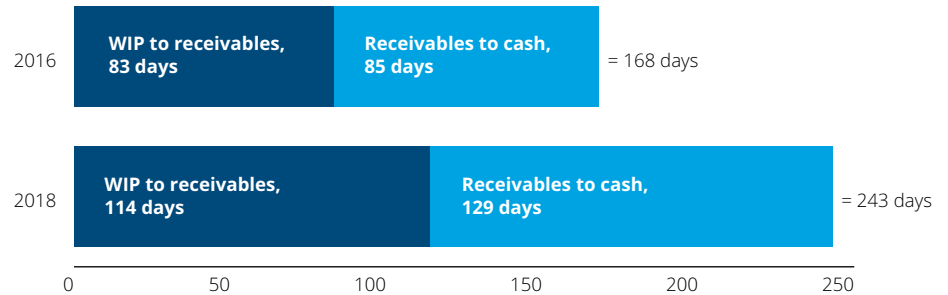
Computing the average working capital cycle, we identified that on average it takes 75 days longer than in 2016 to receive payments for the work done.

The increased time in the working capital cycle appears to be attributable to two factors:

- delays in the conversion of ‘work done (WIP) to receivables’ (i.e. delayed certifications), which increased by **31 days** (2018: 114 days; 2016: 83 days); and
- increased ‘collection time of receivables’ once certified, which increased by **44 days** (2018: 129 days; 2016: 85 days).

The above collection timeframe assumes no legal or contractual disputes. The respondents indicated that when there is a dispute with the employer, the collection period is substantially longer –

Average time taken to receive payments for work done



and this further increases the company’s liquidity pressure.

Volume of contractual disputes on the rise

When asked how significant the anticipated settlement of unapproved claims is to their future profit and loss, 33 percent (2016: 19 percent) said they expect it to be more than 5 percent of revenue.

Given the quantum involved in disputes, contractors still feel they have little choice but to enter into dispute resolution proceedings. These proceedings are on the rise as liquidity pressure increases and cash collection becomes critical.

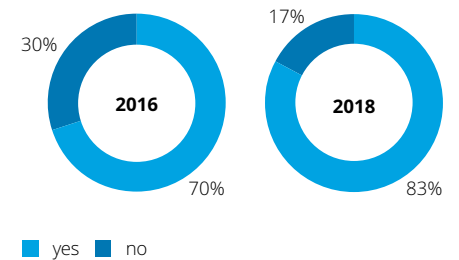
The increase in dispute activity is evidenced by the fact that 83 percent (2016: 70 percent) of respondents are currently involved in some form of contractual dispute, whether due to unapproved variations, contractual claims, project cancellation or other matters, with 78 percent of respondents rarely recognising revenue associated with these disputes until they are resolved.

When asked if pricing on tenders had become more competitive, 100 percent of respondents agreed it had. Sixty-seven percent (2016: 58 percent) responded that the final realised project gross margin was typically less than the tender gross margin, which aligns with the increased number of contractors being more inclined to follow a dispute resolution process.

Time required to resolve disputes

The survey results indicate the average dispute resolution time appears to have increased by almost five months, from two years in 2016 to two years and five months in 2018. These are significant timeframes when considering the contractor (and the employer) will be incurring additional legal and professional fees during the resolution process, further affecting net margins and cash flows, and putting more pressure on funding requirements.

Percent of respondents currently involved in disputes



Final outcome of the dispute resolution process

As indicated above, dispute resolution processes can take long time to resolve. Therefore, we asked respondents who had been involved in a recent contractual dispute their view on the outcome of the settlement. The responses are set out below. ➔

In more than half of cases reported (54 percent (2016: 56 percent)), the contractor felt that the dispute resolution process was not favourable for them, and that the settlement was less than they were entitled to. However, there has been a 20 percent increase in number of contractors who believed that the outcome of the settlement was a good result.

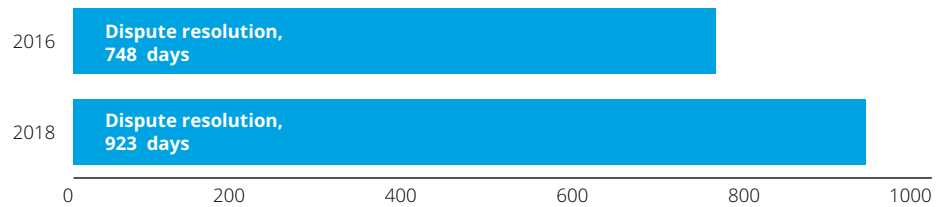
Financing availability

Given the increased need to fund projects, respondents were asked about their experiences regarding the availability of finance. Based on the survey results, there has been a deterioration in the availability of finance to companies, with 33 percent of respondents finding it either **'somewhat hard to get'** or **'very hard to get'** financing, as compared to only 13 percent of respondents in the 2016 survey.

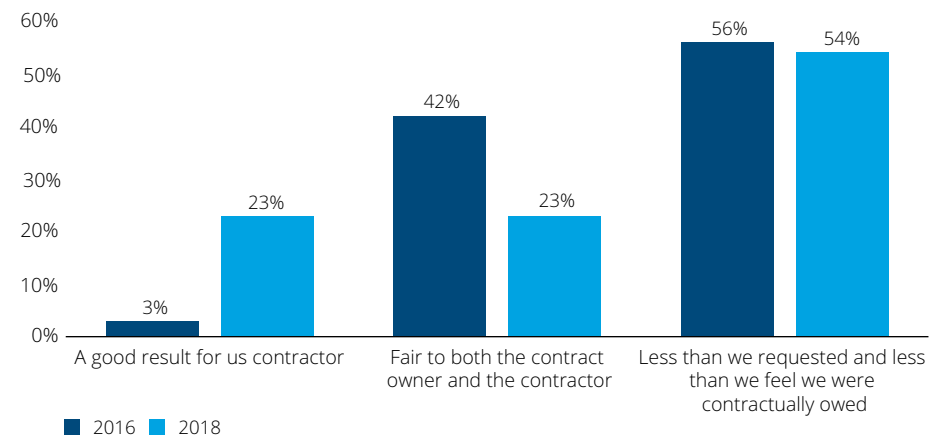
The following themes emerged from the survey.

- **Increased market optimism but limited to revenue, with a decline in the expected margins.** There is an increase in optimism among respondents relating to their companies' future prospects. Overall, it appears the next 12 months will provide satisfactory revenue growth for many, but that optimism is limited to revenue growth, with competition in the market continuing to put project margins under significant pressure.
- **Financing – the demand vs. availability.** The demand for finance stems from the increasing payment delays in the market, coupled with the growing number of disputes and expanding resolution timeframes. However, companies are finding it harder to obtain financing than before, leading to a fear that the cost of finance will rise, with a commensurate impact on net margins.

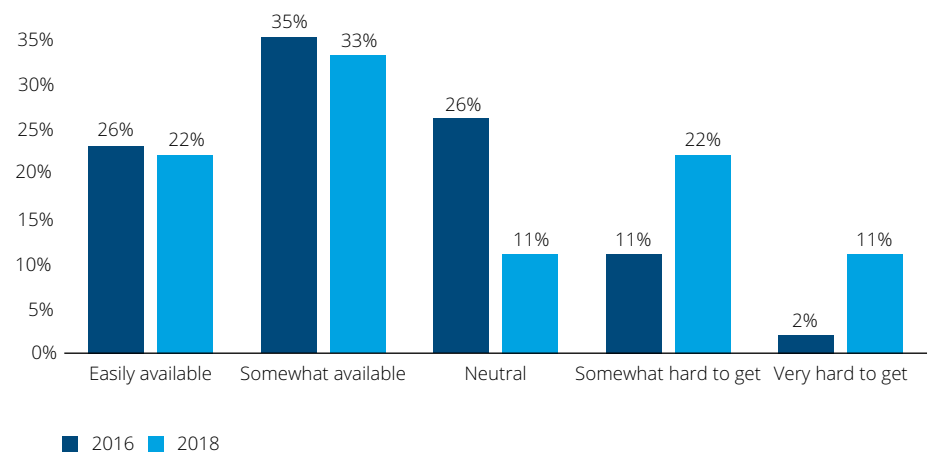
Average time to resolve contractual disputes



Outcome of recent disputes



Views on availability of finance



Having enough cash to fund the completion of ongoing projects and resolve an increased number of disputes is key to ensuring the contractors can trade through these challenging market conditions.

• **Increasing disputes improving results.**

Dispute resolution timeframes (legal and contractual) appear to be on the rise.

And despite the increased time it takes to resolve a dispute, there is an increase in dispute volume. This is primarily due to the financial significance of the disputes, and pressure on cash and margins.

The silver lining in all of this is that the final outcome of the dispute awards appears to have improved for the contractors.

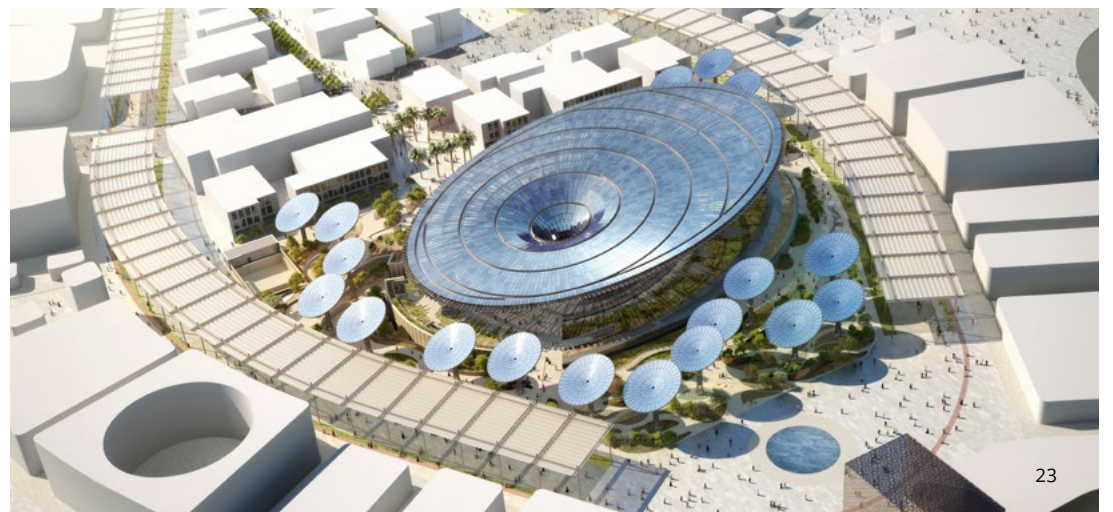
Given the continuing challenges facing contractors, it is more important than ever for companies to efficiently manage cash flow so that projected revenue increases are not at the expense of project margins. Having enough cash to fund the completion of ongoing projects and resolve an increased number of disputes is key to ensuring the contractors can trade through these challenging market conditions. ●

Note to reader: This was a 'pulse survey' conducted to ascertain the views of the C-Suite. It is not intended to be scientific in its number of respondents, selection of respondents, or response rate.

by **Jaimi Raikundalia**, Audit Principal, and Pavan Kumar, Audit Manager, Deloitte Middle East

Expo 2020 Dubai – 'Connecting Minds, Creating the Future'





Expo 2020 Dubai will be the first World Expo to be held in the Middle East, Africa and South Asia (MEASA) region. With 190 countries having confirmed that they will take part, Expo has surpassed the 180-nation commitment set out in Dubai's successful bid to host the event, and a number of significant partners have also signed up, including Cisco, DP World, Emirates NBD, and Etisalat.

The US\$8bn Expo 2020 transport and infrastructure projects have driven UAE's construction boost, with projects that better integrate the city such as the Dubai metro red line extension and the expansion of Al Maktoum International Airport. Construction of the Expo site is well advanced, with more than 70 million work hours having been completed to date. The workforce onsite is expected to swell to 40,000 people in the coming months – ranging from construction works to third-party stakeholders to participating countries – which requires a significant amount of coordination and collaboration on site for a project of this scale. UAE-based contractors are of course playing a leading role in the construction effort, thanks to Al-Futtaim Carillion, Khansaheb, Besix, Arabtec, Alec, Lang O'Rourke and Tristar Engineering, as well as early works completed by Al Naboodah Construction.

All major design elements are already complete, with 28 amendments to the master plan to date – the last being the iconic Al Wasl Plaza, a 130-metre wide, 67.5-metre tall domed space that features an immersive 360-degree projection surface visible to people both inside and out. The development also showcases a number of innovations that support the environment. For example, the Sustainability Pavilion uses innovative technology to harvest solar power and water from the air, and the Opportunity Pavilion is fully built from organic, recyclable materials – no cement – such as a canopy made from 111 kilometres of woven rope. Embracing innovation is not only represented in the planned Expo

Experience or the design and functionality of the Legacy of Expo, but is something we have also embraced in the construction process itself. Among the unique designs are pavillion with moving wings and another that can tell you a poem. It's architecture that'll make visitors wonder "How did they do that?"

Economic and social impact – weaving the social infrastructure of the future and engaging minds

Expo 2020 hopes to bring significant economic benefits the region. To date, more than 25,000 suppliers have registered to do business there, with more than half of all contracts being awarded to SMEs.

Our vision is that the Expo will continue to create opportunities that endure long after the climax of the 173-day event. A global innovation and partnership programme has an allocated US\$100 million to back projects that offer creative solutions to improving people's lives or preserving the planet – or both.

Opportunity We all have the power to shape the future.

Meanwhile, Expo Live's University Innovation Programme is encouraging and supporting university students in the UAE to work together to find creative solutions to some of the most pressing challenges in the country and wider region. Launched in September 2017, the programme has already provided 47 teams of students with grants of up to AED 50 000 each, plus exposure and support to help develop their creative solutions.

Mobility When we enable smarter movement of knowledge, ideas and goods, a new world of possibilities unfolds.

For younger students, the Expo School Programme aims to inspire the younger generation by engaging with schools and educators across the UAE. Through various initiatives including school roadshows and Expo field trips, the Programme has already reached more than 40,000 students from 620 schools in all seven Emirates, and hopes to reach many more on the journey to 2020 – educating and encourage them to play an active role in advancing human progress.

The legacy

At least 80 percent of the Expo-built structures will be transformed into District 2020, a new urban area designed to foster collaboration, creation and innovation. It will boast the latest trends in modern living, with 65,000m² of residential space and 135,000m² of commercial space in a location that will be home to world-class innovation, educational, cultural and entertainment facilities, as well as a Conference and Exhibition Centre (CoEx) built by Dubai World Trade Centre.

The Sustainability Pavilion will become a Children and Science Centre post-Expo, continuing to educate and inspire youth, and many other major structures, including Al Wasl Plaza and the Mobility Pavilion, will remain as permanent fixtures in District 2020.

The development is already attracting interest from important regional employers. Siemens, for example, has committed to establishing its global headquarters for airports, cargo and ports logistics at the site.

The significant investment in the supporting infrastructure for Expo 2020, such as the road networks, metro expansion and utilities and telecommunications investments, are enhancements that will continue to benefit Dubai and its communities long into the future. ●

Ahmed Al Khatib, Chief Site Delivery Officer at Expo 2020 Dubai

Sustainability

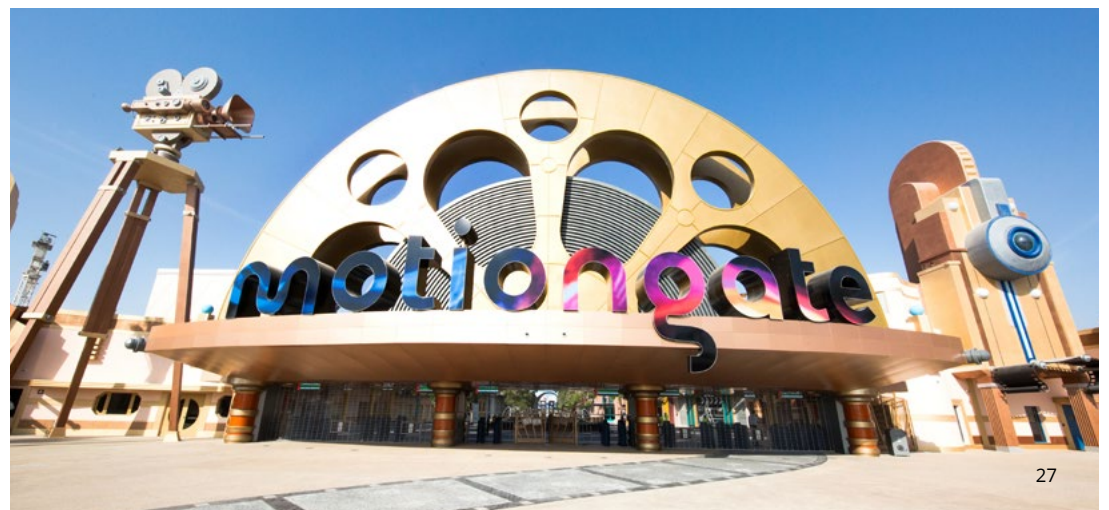
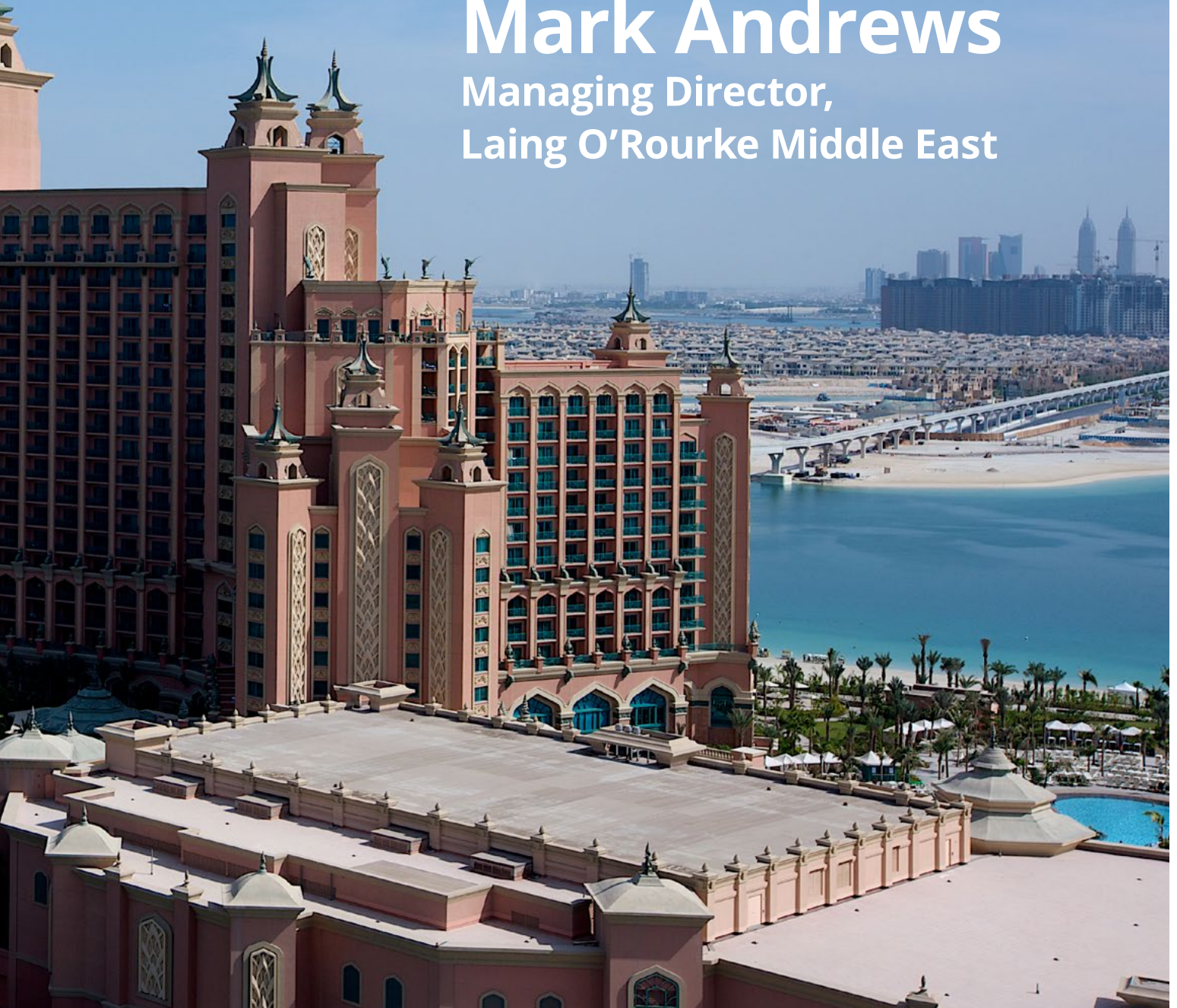
The need to live in balance with the world we inhabit has never been more critical.



Interview

Mark Andrews

Managing Director,
Laing O'Rourke Middle East



You've been in this region for a number of years now; is the GCC construction sector turning the corner yet? What changes do you think are still required in this marketplace to help the growth aspirations of this region?

Market conditions in the UAE remain difficult, with terms and conditions hardening, and some bids requiring significant increases in bonding requirements. The overall contracting model still needs to mature to get to a situation that best balances the risks and rewards between the contractor and the developer. We're still experiencing a situation where the rewards are reducing and the risks increasing, which is not where the industry had hoped we would be. In places such as the UK, the contracting market has changed dramatically over the past five years. The UK construction industry has worked to achieve a more balanced contractual relationship. This is a position we need to achieve in the UAE with a more sophisticated approach to developing and contracting. It requires a package of change: bonding requirements decreasing, along with much fairer terms and conditions, and a much faster dispute resolution process.

If the terms and conditions are fair and applied as a proper rule of law, and there is a process for a quick resolution of disputes, then long-term relationships can be maintained with contractors, and you develop a balanced commercial relationship without the need for performance bonds.

In the past financial year, Laing O'Rourke won significant new projects, including the Khazna data centre and work on Expo 2020 Dubai. But the market remains difficult, with limited visibility of future pipeline. Consumer confidence is said to be low in the region; retail is down and there's a perceived oversupply of residential and commercial property.

I believe that developers should embrace a Design and Build (D&B) model that allows contractors to better manage the build process while being in control of the design. This allows better sequencing of the job, and reduces the extent of claims. It's a model that has been successful for us in the UK and in Australia, and could bring benefits to the UAE.

Fortunately, we're in a position where our work book is secure for this year and next; we've been very conscious to focus on the scale of the business to ensure we're able to flex as and when required.

You've adopted a selective bidding policy. Has that approach been successful?

We want to deliver our projects with certainty, using innovation and technical engineering capability, working with clients who value our proposition. In any market – but particularly during economically challenging periods – it's vital to bid on and deliver projects that return an investment, and we have been clear and resolute that we will protect the sustainability of the business. We won't chase low-margin work.

The construction sector in the UAE continues to present a significant volume of variations and, consequently, claims occur. I'd like to get to a position where construction partners are involved at a much earlier stage, when they are better able to influence the design. I believe that developers should embrace a Design and Build (D&B) model that allows contractors to better manage the build process while being in control of the design. This allows better sequencing of the job, and reduces the extent of claims. It's a model that has been successful for us in the UK and in Australia, and could bring benefits to the UAE.

What's your view on innovation in construction?

In the UK, our innovations are around the increased use of off-site methods – our Design for Manufacture and Assembly (DfMA) approach. This approach uses digital engineering and BIM modelling, construction manufacturing capabilities and logistics – all of which enable an on-site assembly process.

The UAE could benefit from a DfMA approach, but to get there we need to influence the market, which involves increasing the use of D&B and creating more collaboration. There are hurdles to overcome, including the relatively low cost of labour in this market, which does not currently incentivise the use of the DfMA model.

Having said that, I'm absolutely convinced that DfMA is the way to go. Manufacturing in a factory-controlled environment reduces the need for people to work outside – often in uncomfortable conditions – and with quality checks carried out before product arrives on site, there's more certainty in the delivery timelines.

We've gone through a long learning process on how to use a DfMA approach, and have seen successes when we're involved upfront in the engineering and design: building a project digitally, converting

that into how we will build it in the manufacturing/pre-cast process, and then finally handling the logistics and assembly process. When you see this whole process work, it is fundamentally different to a traditional build.

Other innovations?

There's a raft of innovation already being used across construction, including the use of drones and virtual reality design experiences. But the fundamental innovation has to be around the use of modular building; getting the engineering right upfront, and using offsite manufacturing and assembly to achieve the build quality required. With all of that comes efficiency, faster delivery and an effective build – with minimal waste in terms of delays and changes.

In my view, traditional reporting systems have to be modified. The digital enablement of our company is an area in which we have invested. We use daily dashboards on our projects, which give us timely information, which improves our decision making. If you look at the typical systems, there's an army of surveyors and cost consultants, partly due to the contractual models and partly to the data processes. This is a key area that needs to be more automated.

What insights do you have on sustainable building?

The only way a contractor can really get into the sustainability model and whole-life costing is being involved from day one on a full D&B basis. To date, there has been a tendency in the UAE for developers of buildings to prioritise their budgets to achieve the desired design and the desired cost. Rather, developers should consider functionality and the long-term cost savings certain design or build changes could achieve without compromising the overall design, but perhaps requiring more investment upfront.

The fundamental innovation has to be around the use of modular building; getting the engineering right upfront, and using offsite manufacturing and assembly to achieve the build quality required. With all of that comes efficiency, faster delivery and an effective build – with minimal waste in terms of delays and changes.

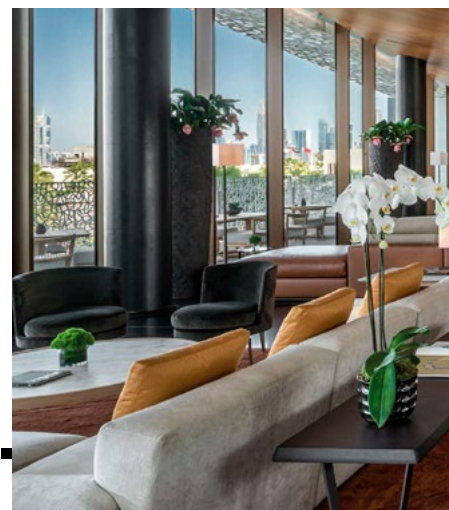
When you look at constructing any building, you ask three fundamental questions: How iconic do I want the building to be? What is the building cost? What is the energy footprint? You can pick two of these, and the third is pre-determined. To date, the focus has arguably been on iconic design and cost, which has meant that sustainability aspects have been compromised to achieve the budget and design. To embrace sustainability, the building priorities must change.

What will you seek to prioritise in the coming years?

My focus is on successfully and safely delivering our current project portfolio, and of course securing high-quality projects for our future pipeline. Our experience and expertise in D&B MEP is well suited to pursue opportunities in further high-tech and data-centred developments.

I hope to see a continuation of certain niche opportunities from a small number of clients who really value our proposition. I think that the next few years will remain tough while the opportunities for international investment in the region are developed and executed. ●

Mark Andrews, Managing Director of Laing O'Rourke Middle East



How to deliver complex construction projects successfully

A contractor's view



The great majority of large complex projects are late and over budget.

Construction projects have become more complicated and layered, with multiple stakeholders that are not necessarily aligned towards a successful project. The challenge we face in our industry is to address these current issues in a constructive way that ensures a positive outcome in the future.

The three Cs

The three critical players on a project are the **client**, the **contractor** and the **consultants**. These parties need to work together and need to be aligned to ensure project success. The contract documents should accurately reflect this intent. A solid constructive working relationship between these individuals is key, with common objectives and a focus on project outcomes. These influential key individuals will ultimately determine the project culture.

The **client** plays a critical role in creating a project environment in which all parties may succeed. The client needs the experience and knowledge to galvanise the project team and drive it in the right direction. The best way to build trust in a team and set it up for success is to deal with issues quickly and fairly, resulting in positive project momentum. Ultimately, the client should know what it wants from the beginning, should limit changes and disruption, and should pay all parties on time.

The **consultants'** role needs to be clearly defined, with specific deliverables, and there should be no ambiguity as to their responsibility. The design should work, and it should be cost-effective and efficient. All information and approvals required should be delivered in line with the project execution strategy.

The contractor should set a clear direction on the project with a well-considered plan. All stakeholders should understand this plan and the execution strategy. Throughout the duration of the project, all

the parties must adhere to the schedule from design to approvals and execution. The project execution strategy should be simple, graphical and easy to understand. It is critical that the important aspects of the plan are captured and communicated effectively to all the teams; a complex, 20,000-activity programme will not be read or understood by the vast majority of users.

Our industry has demonstrated a clear appetite for new technologies and innovation. Creating a culture where everyone is constantly trying to improve efficiency and production is vital. Everything should be simplified as much as possible, and improvements should be recognised and communicated throughout the business.

Add more value

If you have already succeed in establishing great teamwork between the client, the contractor and the consultants, the following elements will further add value to a project.

- Contract document: fair and reasonable, with clear accountability aligned to project success.
- Contract specifications: clear, with no ambiguity, and with a true reflection of the latest technologies and products available in the market.
- Measurable team goals that are not constrained by contract documents and specifications.
- Open, direct and constructive verbal communication to resolve issues. Only write to record the discussion.
- Proactive discussion around potential risks, with mitigation and prevention plans.
- BIM is optimised – we design once and only once; redesigns are minimised.

Creating a culture where everyone is constantly trying to improve efficiency and production is vital. Everything should be simplified as much as possible, and improvements should be recognised and communicated throughout the business.

- Conflicts and disputes are resolved quickly, and if not resolved, are elevated to the next management level in the respective organisations.
- Create a culture of continuous improvement and innovation that is embraced by all. Recognise success, and praise the teams for the great effort and work done.
- Standardise as much as possible – do not reinvent the wheel.
- Leadership should be visible, active on projects, and in touch with the people who are executing the work under difficult circumstances.

Creating these environments is the greatest opportunity we currently face in our industry. They will result in overall team success, and we will build long-lasting relationships that lead to repeat business between the stakeholders. This is a dream that drives us on daily basis in order to deliver high-end, complex projects. ●

by **Kez Taylor**, CEO of ALEC





Is it time to change how major capital projects are delivered?



Alternative delivery models and digital innovations are helping break the traditional delivery structures that have come to hinder capital project delivery. There are many examples where this 'rethinking' is improving performance, and these pioneering projects are shaping how future projects will be delivered.

Introduction

Delivering infrastructure and capital projects successfully is difficult. Work is often undertaken in a complex environment that is prone to failure. Capital projects span many sectors and include new railway lines, airport expansions, oil refinery upgrades, broadband network installations and the construction of new hospitals. But despite this breadth of sectors, the problems encountered by projects are often similar.

Schedule delays, cost overruns, quality issues, cancellations; project failure rates are well documented and widely reported across the world, but change is in the air. Many governments and private sector organisations have started to rethink the way in which they deliver projects, and this is resulting in significant improvements.

Given that these projects often deliver important national infrastructure, they sit at the boundary between the public and private sectors; a boundary that has shifted recently, with previously hands-off governments becoming more active in project delivery to create an environment that enables the private sector to be more effective.

Alternative delivery models and digital innovations are helping break the traditional delivery structures that have come to hinder capital project delivery. There are many examples where this 'rethinking' is improving performance, and these pioneering projects are shaping how future projects will be delivered.

This article considers whether the Middle East is also at a tipping point, and whether this rethinking has a key role to play in realising the ambitions set out in national transformation programmes.

The current challenge

The ambition and scale of investment in infrastructure and capital projects in the Middle East is significant – and not only from a financial perspective. These capital projects are the fundamental building blocks of the

socio-economic transformation of many countries in the region.

However, the record of project delivery in the Middle East is poor. Recent studies highlight the continued delays and cost overruns caused by a variety of issues, such as a lack of upfront planning and overly optimistic baselines, complex stakeholder landscapes, slow decision making, scope changes, and instability of funding, to name a few.

Moreover, the relationship with the supply chain is often adversarial in its nature, with late payments and disputes being the norm rather than the exception.

To compound matters, the current delivery environment and scale of ambition are perhaps not so well aligned. The fiscal contraction at the macro level, as well as a desire to break investment cycles from oil cycles, is driving governments to focus on spending money as efficiently and effectively as possible. To realise the ambition and enable better performance from the supply chain, perhaps it's time to fundamentally rethink how projects are delivered?

These challenges are not unique to the Middle East. Some of the fundamental changes that other governments have made to break free from the old delivery models and improve capital model performance include:

- changing the nature and scale of public sector involvement in the management of projects;
- creating bespoke organisations that sit outside the normal boundaries of government;
- choosing innovative commercial models that approach risk in a different way; and
- embracing a digital capital project mindset, with data and analytics at the core.

Insights

The shifting boundary between the public and private sector

Traditionally, many governments have adopted an 'outsourcing' model on their major projects, where the delivery risk is packaged up and transferred to the supply chain through a 'prime' contract, and a significant proportion of project management is outsourced to a third-party project management consultant (PMC).

Recent experience has demonstrated that this does not always work. The complexity, size and funding arrangements of modern projects often mean that a single private sector organisation is not necessarily best placed to own the delivery risk, and its shareholders are often unwilling to accept the potential liability. Moreover, when major projects are of national importance, governments are unable to tolerate failure; and although some risk can be transferred to the supply chain, ultimately it is the client that holds the risk for unsuccessful delivery.

To address this, a number of governments have taken a greater role in project delivery, accepting that they are the natural underwriter of the project risk. For example, in the UK, the delivery of the London Olympics, High Speed Rail and Crossrail were managed by a public-controlled entity where the public sector took a more active role in the management of the project.

This model recognised that the private sector was not best placed to accept the overall delivery risk, and built a client organisation with the capability to act as the overall integrator of the project. This created an environment where the private sector could be more effectively engaged in the project, and led to a single 'intelligent' client organisation that was able to effectively manage both the delivery and the complex stakeholders around the project.

The current delivery environment and scale of ambition are perhaps not so well aligned. The fiscal contraction at the macro level is driving governments to focus on spending money as efficiently and effectively as possible. To realise the ambition and enable better performance from the supply chain, perhaps it's time to fundamentally rethink how projects are delivered?

Creation of bespoke organisations that operate outside the boundaries of government

Major capital projects are often sponsored and funded by governments, but the way a government operates does not necessarily create the right environment to successfully deliver projects. For example, governments often set fixed annual budgets as a way to control spend, whereas the successful management of long-term capital projects requires the flexibility to move work and resources – and therefore funding – between years.

Capital projects governance is another example. A capital project requires agile and flexible governance that enables timely and expert decision making. This is often at odds with governance in a public sector organisation, which is often fixed, complex and unwieldy.

To address these challenges, a number of governments have created bespoke organisations that operate at arms-length to the public sector to deliver major capital projects. This enables the creation of fit-for-purpose organisations that are more flexible in addressing the challenges of programme delivery. These organisations are supported by appropriate governance arrangements, simplified stakeholder communication lines, suitable funding

arrangements, and the right capabilities to enable better project performance.

Innovative delivery models that approach risk in a different way

The greater involvement of clients in project delivery has also resulted in new delivery and commercial models, as well as innovative approaches to risk management.

The transfer of risk to the supply chain through 'prime' contract arrangements often results in the mobilisation of an army of commercial managers to ensure that the contractor's financial position is safeguarded.

However, the complexity, scale and duration of modern projects makes it difficult to quantify and effectively allocate risk at the outset, and this has prompted alternative models to be considered.

Infrastructure and capital projects have traditionally underinvested in technology, failing to realise the benefits presented by digital innovations. These emerging capabilities provide the opportunity for significant benefits, including better productivity, reduced headcount, improved safety and more real-time insights to manage projects.

For example, the client organisation established by BAA, the owner of Heathrow Airport, to deliver Terminal 5 masterminded a more collaborative arrangement where all parties would benefit if the programme was successful, to prevent costly and disruptive disputes. It achieved this by owning all the delivery risk, and it let project contracts with the Tier 1 suppliers that protected their costs. For each project, a risk contingency was calculated and then set as an incentive pot. At the end of each project, any remaining contingency would be split amongst the client and Tier 1 suppliers as additional profit.

This resulted in an environment where the Tier 1 suppliers focused on successfully delivering the project rather than protecting their commercial position through change requests and dispute proceedings.

Adopting a digital capital project mindset

Infrastructure and capital projects have traditionally underinvested in technology, failing to realise the benefits presented by digital innovations. The term 'digital' covers all manner of potential enhancements, from new ways of working such as robots laying bricks, to the adoption of drones and sensors, to the management of project data (predictive analytics, BIM and digital asset management). These emerging capabilities provide the opportunity for significant benefits, including better productivity, reduced headcount, improved safety and more real-time insights to manage projects. Moreover, they enable a better linkage across the life cycle from design to decommission.

But to access these opportunities requires the investment in some fundamental digital building blocks. At the heart of a digital capital project is data. Major capital projects now generate significant volumes of data, which must be well structured and robustly managed. Once achieved, and through the adoption of technology,

vast amounts of data can be seamlessly integrated and interrogated with ease.

In the short term, this creates powerful reporting of project performance, and the ability to pinpoint issues to be addressed in a timely manner to minimise or remove the cost and time impact. In the longer term, this foundation enables the broader benefits to be realised through advanced analytics and emerging technologies, which both inform delivery and enable more efficient operation.

For this approach to be successful on a major capital project requires the whole supply chain to align under a common approach. This is often adversely affected by the appointment of multiple PMCs on various projects without a central strategy for how project data should come together.

This doesn't mean that all technologies need to be the same, or that suppliers need to change their data structures and approaches; rather it means developing an environment where the data can be integrated with minimal manual intervention.

To make this transition requires upfront investment and drive from client organisations, who are ideally positioned as the overall integrator. However, the right balance must be struck to create an approach that does not constrain the supply chain's way of working with the need to create a better environment to integrate all aspects of a project together.

For example, to transform the project controls capability of the Proyecto Modernización Refinería Talara project, Petro Peru established a single data model to provide a consolidated visualisation of programme performance. Drawing on this 'single source of truth', and supported by digital analytics, Petro Peru was able to create an integrated programme schedule, a risk control system and a set of standardised reports that enabled it to accurately monitor, control and forecast

the health of the programme. Meanwhile, it was also able to give greater confidence to its sponsors and stakeholders.

Conclusion

The national transformation programmes in the Middle East are ambitious, requiring the successful delivery of major capital and infrastructure projects. There are many challenges that threaten that success, but they've all been encountered by other governments across the world; governments that have started to rethink the way in which they deliver their projects, resulting in significantly improved performance.

If you would like to continue the discussion on these approaches, or would like to understand what this could mean for your projects, please contact Deloitte's Global Capital Projects team. ●

by **Tim Parr**, Partner, Consulting CEO, Global Head of Capital Projects, and **Paul Hirst**, Director, Infrastructure & Capital Projects, Deloitte Middle East

To access digital capital projects opportunities requires the investment in some fundamental digital building blocks. At the heart of a digital capital project is data. Major capital projects now generate significant volumes of data, which must be well structured and robustly managed. Once achieved, and through the adoption of technology, vast amounts of data can be seamlessly integrated and interrogated with ease.



A blue-tinted photograph of a city skyline, likely Dubai, with a hand holding a document in the foreground. The image is overlaid with a faint, semi-transparent grid pattern. The text is positioned in the lower-left quadrant of the image.

Drafting contracts with collaboration and partnering in mind

Summary

Effective collaboration and partnering is often essential to the successful delivery of construction projects. For a sector so heavily dependent on co-operation and joint-working, the construction industry can be surprisingly contentious. Factionalism, competing interests and conflict can all too often lead to delays, disputes and fractured commercial relations.

Drafting contracts with collaboration and partnership in mind can help reduce the likelihood of protracted disputes, incentivise party performance and increase the chance of project success.

Why draft with collaboration in mind?

Broadly, partnering or alliancing requires the parties to a contract to work together and collaborate to deliver a project or a set of specific outcomes. In addition to entering into standalone partnering agreements, parties can also seek to incorporate specific clauses into traditional construction contracts with the object of facilitating collaboration and joint-working. When used appropriately, these clauses can help reduce or avoid confrontational behaviour, and lessen the risk of a party taking inappropriate commercial or legal advantage of the other.

Although historically driven by the client, drafting a contract with a view to encouraging collaboration can be in the best interest of all parties involved. Although the UAE construction market is showing activity, profit margins remain squeezed. Not only does effective collaboration increase the chances of delivering a project on time and within budget, it can also improve profit margins and reduce the likelihood of contractors being stuck in protracted disputes or facing lengthy payment delays.

Common pitfalls, and how to avoid them

» *Misalignment of commercial interests* discourages collaboration, encourages disputes and can negatively affect progress of project works. Parties should consider

appropriate methods to increase the alignment of competing interests – for example, by using key performance indicators or introducing payment mechanisms that financially motivate each participant to act in a manner that is best for the project, rather than the individual party.

» *Overly complicated contracts* can often cause ambiguity in the scope of each party's obligations, and lead to unnecessary disputes regarding the interpretation of key contractual provisions. Parties and their legal advisers should make an effort to ensure contracts are clearly drafted and unambiguous.

» *Lack of co-ordination* between contracts can often lead to disputes as to the extent of each party's obligations. We have seen a number of cases where a lack of co-ordination between the early works contract and the main contract have led to otherwise unnecessary disputes.

» *Failure to serve timely notices* can be detrimental to the progress of the works and, in the long run, have a negative impact on clients and contractors alike. Contractors can benefit from the introduction of a system for regularly reviewing site conditions and serving relevant notices.

» *The engineer* should in theory be independent and 'hold the balance' between the parties. In practice, this is often not the case. The client should consider taking steps to encourage independence, and should take particular care if the appointed engineer also acted in the capacity of designer for the project.

» *An overly ambitious baseline programme* often results in otherwise avoidable revisions, and opens the door to early disagreements between the parties. The contractor should ensure that the baseline programme is realistic and achievable, and ensure that it builds in enough time to account for unexpected delays.

Not only does effective collaboration increase the chances of delivering a project on time and within budget, it can also improve profit margins and reduce the likelihood of contractors being stuck in protracted disputes or facing lengthy payment delays.

A proactive approach: drafting contracts with collaboration in mind

A number of clauses can be introduced into construction contracts with a view to encouraging collaboration and partnership. Whilst these provisions can be very effective, there is no 'one size fits all' solution. The appropriateness of each provision should be considered in light of the particular project and parties involved.

- » *Co-operation clauses*, such as the overarching 'good faith obligations' contained in some contracts, can be considered. Against the background of the general good faith obligations in the UAE, these clauses may hold particular sway when incorporated into contracts based on local law. When combined with more detailed collaboration obligations, they have the potential to encourage joint working, and can help nurture an attitude of good faith between the parties.
- » *Regular meetings* between the contractor and client should be considered. Where appropriate, the contract can make detailed provision for holding mandatory weekly or monthly progress meetings.
- » *Designated roles of key project personnel* are commonly found in construction contracts. The parties may benefit from incorporating into the contract a short description of the roles and responsibilities involved in each of the key positions.
- » *Early engagement* and open discussion of potential disputes should be encouraged. Although often uncomfortable for the parties to discuss, when tackled proactively, many disagreements can be resolved or settled without having to resort to costly litigation.
- » *Mechanisms for the service of notice on a regular basis* should be considered. For example, the contract may set out a requirement to circulate a monthly register detailing any extension of time events, or potential variations occurring within the respective period.

These mechanisms can help lower the risk of otherwise legitimate claims being time barred, and reduce the likelihood of employers being faced with a 'bank' of claims toward the end of a project.

- » *Early-warning mechanisms* should be built into the contract. When combined with provisions for mandatory attendance at early-warning meetings, these mechanisms can increase visibility across the contract, and encourage the parties to work together to tackle any delay events and mitigate their impact on the project timetable.
- » *No-blame clauses* may be considered by contractors forming joint ventures, consortiums or alliances. Where appropriate insurances are available, such clauses can substantially lower the risk of disputes between partners and, in combination with profit-and-loss-sharing mechanisms, can encourage contractors and joint venture parties to work together to drive a project toward completion.

Three top tips: communicate, incentivise and engage

1. *Communicate*: encourage clear and frequent communication between all parties involved. Where appropriate, use contractual provisions to allow communication to take place within an organised framework.
2. *Incentivise*: ensure appropriate incentivisation mechanisms are in place to align the interests of all parties involved in a project.
3. *Engage*: introduce mechanisms to encourage early engagement, increase party communication and improve transparency. ●

by **Alastair Young**, Partner at Dentons

Has international project finance deserted the GCC?





In 2018, international project finance debt reached just US\$399 million in terms of financially closed deals. Are international financiers turned off by the GCC, and what is the outlook for 2019?

A slow year

Although 2018 was a busy year for developers, banks, advisers and government authorities, it appears to have been disappointing in terms of completed project financings in the GCC. Initial financings for publicly tendered project finance transactions in the region comprised only three deals, with a total reported debt financing requirement of US\$470 million. Of the total debt deployed across these deals, 85 percent was committed by international project financiers.

Transaction	Debt	International	Local
300 MW Sakaka Solar PV IPP	240	240	-
80,000 cm/d Sharqiyah IWP	109	109	-
115,000 cm/d Salalah IWP	121	50	71
Total (US\$m)	470	399	71











Source: IJGlobal

Compared to 2017, when over US\$1 billion of project finance debt came from international financiers, 2018 could be seen as the start of a trend in reducing appetite from the international debt financiers. However, the amount of international project finance debt arranged in 2018 is explicitly linked to the number and features of the projects available. You can only finance what's in front of you, and there are many reasons to be positive for 2019.

It's a numbers game

Typically, a public open tender for a project finance BOO(T) transaction, be it an IPP, IWP, ISTP or other type of PPP, can take one to two years from launching to the market to reaching financial close. Therefore, those deals that closed in 2018 were initiated in either 2016 or 2017. Hence, tendering activity in 2018 should provide an indication of whether we will see a positive increase in project financings for 2019.

The table below sets out a sample of public tenders by government-related entities, where bids were submitted in 2018.

600,000 m ³ /day Rabigh 3 IWP, KSA	 Water
200,000 m ³ /day Dammam West ISTP, KSA	 Wastewater
300,000 m ³ /day Jeddah Airport 2 ISTP, KSA	 Wastewater
450,000 m ³ /day Shuqaiq 3 IWP, KSA	 Water
400 MW Dumat Al Jandal IPP, KSA	 Wind
900,000 m ³ /day Taweelah IWP, UAE	 Water
500 MW Ibri II Solar IPP, Oman	 Solar
100 MW Amin Solar IPP, Oman	 Solar
1,500 MW Al Dur II IWPP, Bahrain	 Power
100 MW Askar Solar IPP, Bahrain	 Solar

From a tendering perspective, it is clear that 2019 should demonstrate a significant jump in the volume of project finance transactions. However, a large number of deals does not necessarily mean that there will be a large amount of project finance debt from international banks. The interest and participation by international project financiers in these deals will be driven by the specific features of each project.

Attracting the international project financiers

The Deloitte Project & Infrastructure Finance team raised over US\$1 billion in committed and uncommitted project financing in 2018, and a major portion of the interest came from international project financiers. We suspect that this is consistent across the tendered projects in 2018, although it should be noted that debt raised during the tender process does not necessarily translate into completed project financings, either due to the bidder not being awarded the project or the project being aborted or put on hold.

From a tendering perspective, it is clear that 2019 should demonstrate a significant jump in the volume of project finance transactions.

A few key recurring themes among the GCC projects are being actively looked at by international lenders, as set out below.

- Established models with a track record.** Although PPP has become prominent in the GCC in recent years, sectors such as utilities and oil & gas have been employing PPP-style models for decades. IPP models have been evolving in the GCC since the early 2000s and benefit from stable regulatory regimes.
- Critical infrastructure.** Power and utilities projects have featured heavily in 2018, with 10 large projects tendered in the GCC. These types of projects benefit from the 'soft comfort' that the infrastructure is integral to the country and/or economy's future plans, and is not likely to be cancelled or terminated.
- Strong sponsors.** 2018 included a mix of conventional and renewable energy projects, as well as water and wastewater projects, all of which are being keenly pursued by predominantly international developers. Due to established global relationships, these international developers tend to bring along international project financiers.
- Creditworthy counterparty.** The counterparty to the project agreement should be financially robust; ideally a government entity or a government-related entity that benefits from direct backing by the associated government finance department.
- Predictable and stable cash flows.** A tried and tested payment mechanism

and, in the context of power and water generation, a structure where payments are made regardless of whether output is despatched. Such 'availability-based' payment mechanisms are common in PPP deals across the globe.

• Exchange rate mechanisms.

Currencies in GCC countries are currently pegged to the US dollar or to a basket of currencies where the US dollar is a major component. Due to this approach, there is no real requirement for foreign exchange hedging instruments related to the dollar, as this is achieved through monetary policy. Therefore, it is not possible for international developers or financiers to mitigate the risk of adjustments in the US dollar peg cost-effectively, and, in many cases, the offtakers assume this risk either through an adjustment in the payments or a change in law provision.

Benefiting from the involvement of international project finance

Having outlined key project features that attract international project financiers, below are some of the advantages of their ongoing participation in GCC projects.

• Liquidity. The natural home for long-term project finance debt is often quoted as the pension funds and other institutional investors, rather than commercial banks. By including international project financiers from the outset, there is a higher probability that transactions will be structured and acceptable to these long-term investors, often based outside the GCC.

• Potentially lower tariffs. In general, tariffs can benefit from the long-term interest rate hedging instruments available for US dollar lending. This allows developers to mitigate interest rate risk through interest rate swaps that do not tend to be available for long tenor (>15 years) local currency loans in the GCC.

• Structuring and due diligence.

There are a number of highly experienced local project financiers who reside in the GCC; however, comfort can be drawn by

International project finance will play a big part in 2019, and is expected to continue to play a major role as the GCC forecasts more and larger projects in the near future.

the involvement of international project financiers who bring experience to the GCC from projects in other parts of the world.

• Healthy competition. With the number of project finance transactions forecast in the coming years, the involvement of international financiers will bring a degree of pressure on debt margins being proposed locally.

Outlook for international project financings in 2019

Based on the increased tendering activity in 2018, it is highly likely that there will be a corresponding increase in project financings in 2019. The nature of the projects being tendered, which exhibit key features when it comes to attracting international financiers, means that a significant portion of the debt financings are anticipated to be from international debt providers. International project finance will play a big part in 2019, and is expected to continue to play a major role as the GCC forecasts more and larger projects in the near future. ●

by **Vishal Rander**, Director, Project & Infrastructure Finance, Deloitte Middle East

Reference table

International project finance debt	Long-term (>15 years), limited recourse debt provided by financiers from outside the GCC
Completed project financings	Transactions that reached financial close (i.e. first drawdown of project finance debt), excluding refinancings
Public tenders	Process open to all market participants and advertised publicly; usually facilitated by a government entity
PPP	Public-Private Partnership
BOOT	Build-Own-Operate-Transfer
IWP	Independent Water Project
IPP	Independent Power Project
IWPP	Independent Water and Power Project
ISTP	Independent Sewage Treatment Plant

The GCC is key to the UK's export finance offer



Background to UKEF

UK Export Finance (UKEF) was established in 1919 as the world's very first export credit agency. In the 100 years since, while UKEF has continued to innovate, its mission has remained constant: to ensure that no viable trade with the UK fails because of lack of finance and insurance from the private sector. UKEF is a UK government department, and its commitments carry the full weight and authority of the UK government.

The UK has a long tradition of innovation and excellence, and, with an open and friendly business environment and a long record of expertise in the construction sector, is a trusted business partner to buyers around the world. Through UKEF, we want to ensure the quality of UK products and services is matched by agreeable payment terms and competitive finance.

UKEF's business plan for 2017–20, which the government published following the 2017 UK election, set a whole new level of ambition, putting UKEF at the heart of government support for UK trade. We want to be taking a more proactive role in bringing business to the UK, and providing end-to-end support for exporters and their overseas buyers as they build their trading relationships.

To achieve this, we identified 20 priority markets where UKEF support can have the biggest impact, and we also committed to building a new international network for UKEF, putting front-line finance experts on the ground to grow our presence. Several of these markets are in the GCC region, and it has always been a key market for us – in the past two financial years, we provided more than £2.5 billion in support for projects in the region. Dubai was therefore a natural choice for one of our first regional teams, which is headed by David Moleshead, based in the British Embassy.

UKEF support is increasingly seen as a game-changer for international projects, giving a huge advantage to borrowers, banks and contractors.

David's role is to engage private and public sector project sponsors and buyers in the UAE and across the Middle East, finding projects that can benefit from the high quality of UK suppliers as well as UKEF's financing support, making for a compelling proposition. While the team on the ground is new, UKEF has been an important partner for our key stakeholders in the region for a long time. Having a permanent physical presence in the same location and time zone can only enhance our offering to these parties in the region.

UKEF's track record in the Middle East

If you look at the Dubai skyline, you can see the impact UKEF support can have. The UK's export credit agency has supported some of the city's most iconic projects – the expansion of One Central at the Dubai World Trade Centre, Bluewater Island, the Dubai Arena, and in next-door Sharjah it is backing the construction of Bee'ah's remarkable new 'green' headquarters building, which is designed to be powered by 100 percent renewable energy by 2021. UKEF also supported the sukuk arranged for Emirates Airlines – a first for an export credit agency.

In the wider GCC region, we've played a significant role in the oil & gas sector, having supported the Liwa Plastics Industries Complex and Duqm refinery expansion in Oman, and the Sadara petrochemicals plant – a Saudi Aramco and Dow Chemical joint venture – in Saudi Arabia. And for other countries in the region, for example Bahrain and Iraq, we have provided support for key utilities projects to improve public services – in particular, through provision of water and power.

And we can do more: UKEF has a capacity of billions of pounds to support business in the region, including £5 billion for the UAE and £4 billion for Dubai itself. As David and the team grow our pipeline of business in the region, the main focus to date has been the UAE – not just the prime markets of Dubai and Abu Dhabi, but the Northern Emirates of Sharjah, Ras Al Khaimah, Fujairah and others as well – and we have plans to expand our relationships further.

UKEF support is increasingly seen as a game-changer for international projects, giving a huge advantage to borrowers, banks and contractors; but many people still don't quite know what it is. For buyers, it provides access to a new source of finance, with potentially higher loan-to-value amounts, longer tenors to repay, capitalisation of interest during drawdown and lower interest margins. For UK exporters and contractors looking to sell overseas, it gives certainty of payment as the finance is 'ring-fenced' for payment of specific contract/project items. And for banks, it means they can zero-weight the loans for capital weighting purposes, thus improving their return on capital.

That's why, once clients have actually used export finance, they become very strong advocates and recurring partners.

UKEF's support

UKEF has fantastic products that benefit both UK companies and the international governments and project owners that source from the UK. For buyers in the Middle East – both public and private sector – its support can help make sure capital goods or services from the UK come with competitive terms of finance.

UKEF can help overseas project sponsors access attractive long-term financing – both through guarantees on commercial lending and through loans directly from the UK government – that makes sourcing from the UK more competitive. It can support a range of flexible and innovative financing options to make projects happen, including repayment terms of up to 10 years, project finance, capital markets refinancing, sharia-compliant structures and more than 60 international currency options – including the UAE Dirham, Saudi Riyal, Bahraini Dinar, Qatari Riyal, Omani Rial and Kuwaiti Dinar.

UKEF provides support where the commercial finance sector isn't able to, and operates at no net cost to the UK taxpayer, so we charge a premium and only provide support where a transaction meets our risk – as well as environmental, human rights and compliance – criteria.

For UK exporters, UKEF can support access to trade finance and export insurance for companies of any size, and in any sector, that sell goods, services and intangibles such as intellectual property. Nearly 80 percent of the companies we support are SMEs, and as of last year, we can also provide trade finance support to companies that aren't yet exporting themselves, but are supplying to an exporter. This means that smaller companies selling to contractors on larger overseas project can qualify for UKEF support, which is a great way to become part of international supply chains and grow business overseas.

UKEF provides support where the commercial finance sector isn't able to, and operates at no net cost to the UK taxpayer, so we charge a premium and only provide support where a transaction meets our risk – as well as environmental, human rights and compliance – criteria.

Traditionally, UKEF's strength has been in sectors such as infrastructure, aerospace and energy, and these continue to be important areas for the department. However, in the GCC, we are increasingly seeing demand for Britain's high-quality and innovative goods and services to support the region's diversification agenda – notably in education, healthcare, life sciences, renewable energy, transportation and technology. In fact, there isn't a commercial venture in this part of the world where the UK can't play a part.

We want to support the region in delivering these projects, helping its governments meet their ambitious targets. We believe these ambitions will become more achievable if they use cutting-edge companies and services such as those that we have in the UK. But access to finance is just as important, which is why the attractive financing offered by UKEF is so relevant in the region. ●

by **Simon Penney**, Trade Commissioner for the Middle East, UK Government





Applying smart thinking to the built environment

Our planet is becoming increasingly urban. Nearly 70 percent of the world's population will live in urban areas by 2050¹¹, and 60 percent of these urban dwellers will be under the age of 18¹². Even today, over 1 billion of the planet's urban residents are children¹³. There were 37 megacities in 2018, each with over 10 million residents¹⁴; by 2050, there could be over 50 megacities, with the top 8 having more than 30 million residents each¹⁵. There is a pressing need for us to be better at city building on a planetary scale – not just to protect our delicate global environment, but also for the prosperity of the human race and the ability of the next generation to thrive.

Our industry must be smarter in the built environment to achieve this. 'Smart' is not just about data and digital innovation, it's about applying them to achieve specific outcomes. Indeed, smart thinking sometimes does not include data and digital at all, but the application of intelligent design and integrated answers.

Whilst cities are often focused on the achievement of local needs, we must influence city leaders to contribute to strong strategic goals that have long-term and lasting benefits for our planet. These goals already exist.

The United Nations Sustainable Development Goals (UNSDGs) came into force officially in September 2015, when they were adopted by world leaders at an historic summit. These goals recognise that to end poverty, tackle climate change and protect the environment, we need economic prosperity and growth – and that prosperity and growth require the social needs of populations to be met through education, health, social protection and job opportunities. The UNSDGs' 17 goals and 69 associated targets create a common framework for our industry to work within. Some are more closely associated with cities and the built environment, but all are important and I urge you to become familiar with them.



If we take a single goal – Goal 11: Sustainable Cities and Communities – this has 10 associated targets, and is clearly linked to the built environment. The targets include aspirations for better housing and services, access for all to jobs, better public transport, special attention to vulnerable users, sustainable human settlement planning, protection of cultural and natural heritage, resilience against disasters, improved road safety, better air quality and waste management, universal access to green and public space, strong regional and national development planning, greater inclusivity, resource efficiency, sharing of knowledge and sustainable and resilient buildings.

Smart thinking applied to the built environment to achieve these targets and ultimately this goal is being applied around the world.

It is imperative that cities learn and share their experiences to achieve goals more effectively. Often, cities apply single innovations, but the real power of smart thinking is where these combine. For example, four recent technology innovations to improve the walking environment in cities are entirely complementary, and yet currently happening separately in London, Melbourne, Seattle and New York:

- i-Tree Green Cover Survey Project (LEAF for London Mayor's Office). This volunteer survey of London's trees is the first step

towards a proposed 5 percent increase in tree cover by 2025;

- Smart LED Urban Lighting Strategy (CitiPower for City of Melbourne). By upgrading streetlights to a network of smart LEDs, Melbourne aims to cut energy bills by 56 percent, as well as limit maintenance costs, increase brightness and improve night-time wayfinding;
- 'State of Place' Quantified Urban Data Analytics Project (Mariela Alfonzo for NYU-Poly). This amenity-indexing algorithm attempts to quantify the 'pedestrian appeal' of given locations, using hard-data tools to present an economic case for prioritising walkability in new developments; and
- WalkScore Neighbourhood Accessibility Assessment Tool (Walk Score/Redfin for commercial use). This web – and app-based neighbourhood assessment tool allows users to view any location's 'walkability score', based on average distance to a user-defined set of amenities.

The most appropriate solutions can then be applied with new insights. These can often be low-tech solutions, such as the Rainbow Stairs public realm improvements initiative in Istanbul, which transformed a previously neglected public concourse into a tourist attraction and source of local pride, inspiring other interventions across the city.

The combination of these environmental, social and security improvements have the potential to achieve a significant increase in the number of people walking in our cities. This in turn reduces vehicular trips, which in turn reduces infrastructure capital and operational costs, reduces air pollution, increases the health of citizens, reduces the burden of long-term ill health on society, extends life expectancy and improves social cohesion and wellness. Clearly achieving this UNSDG also makes strides towards other UNSDG goals and targets.

The above innovations are the 'now', but what is 'new' and 'next'? Smart thinking must be flexible now to allow maximum benefit from the new and next. Achieving better outcomes through smart thinking beyond what we know today is vital. However, deep technical and cross-sector thought is required to prevent the unintended consequences of new and next technology from having a negative overall impact, and must be an integral part of smart thinking.

Let us consider autonomous vehicles (AVs). There is much discussion related to positive impacts, but it is possible that the increasing ownership of AVs by private citizens will increase congestion across a city, as more people have access to a vehicle, and that vehicle travels alone to and from a free parking space at home. We must consider the implications of how new technology is introduced. If we are to benefit from increased safety, reduced city-centre parking requirements and reduced levels of congestion, then we must also consider how we change social norms of car ownership and behaviour associated with today's travel patterns and expectations. We must then consider the implications across different sectors; if electric vehicles make up an autonomous fleet, how does this affect the energy demand for the city? If there are fewer deaths on the road, how does this affect organ-donor needs? If people can be picked up and dropped off close to their

Deep technical and cross-sector thought is required to prevent the unintended consequences of new and next technology from having a negative overall impact, and must be an integral part of smart thinking.

destinations, will obesity and its associated health issues increase? If AVs are more convenient, what will make people continue to use the mass-transit systems? Will the health sector and energy sector need to work in close partnership as part of a transition towards this future?

This integrated transitional and consequential thinking must form part of any government strategy to scale up from pilot studies that simply don't consider the city-wide implications of new technology. And this is only for one new technology in front of us. There are many more – and many more still – that we have not even conceived of yet.

If I were to define smart thinking in one sentence it would be: 'to be consciously aware of what is being implemented all over the world, thinking broadly about how these complement each other, and then applying the best of what we know to a given objective, with a constant

eye to the future and the transition and consequences of new innovations in the most integrated and cross-sector teams that can be created.' Quite a challenge for our changing industry! ●

by **Joanne Carmichael**, Director, Middle East Planning Leader at Arup

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Funding and financing smart city infrastructure

‘Smart city’ investment needs are here to stay

The smart city concept is playing an ever-more critical role in meeting the challenges cities face. Digital and traditional infrastructure increasingly connects government, citizens, business and non-profits to transform cities across a range of domains, including environment, economy, mobility, security, education and living¹⁶ (Figure 1).

By embracing new smart city models, cities are not only made more safe and secure, but also more resilient and globally competitive. Smart cities can also help governments reduce costs and increase revenues while serving citizens better.

This requires physical infrastructure investment across a range of domains; cities that do not meet this investment and delivery challenge will be left behind.

Those looking to provide innovative solutions and funding capacity to advance smart city agendas must turn to the private sector; just 16 percent of cities are able to self-fund required investment into infrastructure projects¹⁷.

In this article, we assess the role and significance of smart city investments for the GCC, consider the trends and challenges to date, and highlight the potential role of improved private sector participation to meet these challenges.

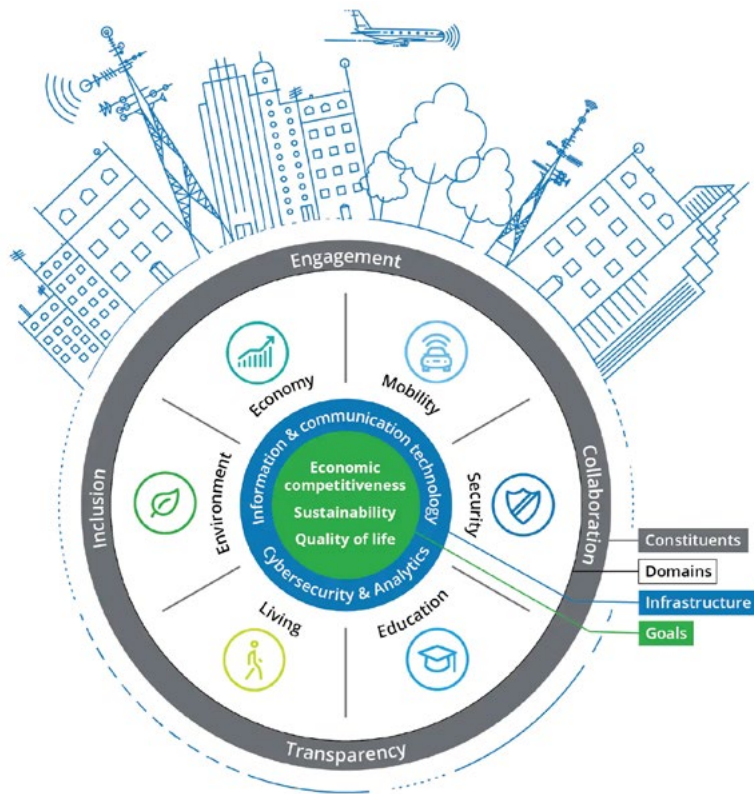
GCC governments and citizens stand to be the biggest winners from smart cities

A number of macro-drivers position the GCC region as one of the biggest potential winners from successfully delivering smart city investments and sustainable urbanisation; however, it also faces among the largest risks from a failure to do so. The key drivers are set out below.

Relatively high rates of urbanisation and a rapidly expanding population

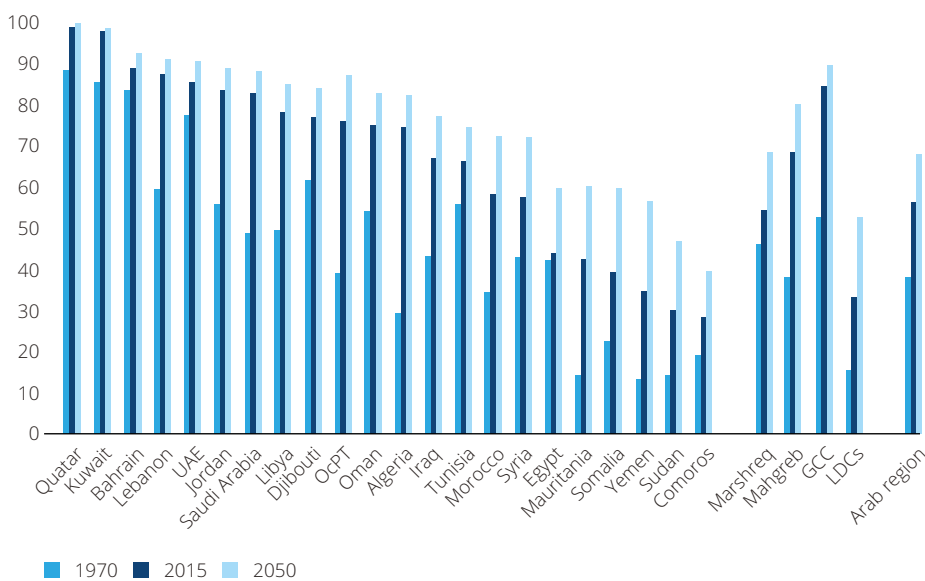
GCC countries have a young, rapidly growing population, and very high current

Figure 1. Deloitte smart city framework



Source: Deloitte Insight | deloitte.com.insight

Figure 2. Urban population projections (%) – Arab region



Source: UNDESA (2017)¹⁸.

and forecast levels of urbanisation. This compares to a current global average of around 55 percent, with 82 percent in Northern America and 74 percent in Europe¹⁹ (Figure 2).

Economic transformation and diversification requirements

A number of national transformation programmes in the region reflect the dependency of many GCC countries on the hydrocarbon economy. Falling and volatile oil prices from 2014 have had a major economic impact. The global transition to new energy sources may also leave economic gaps that need to be filled, presenting both an opportunity and a risk. The economic value created by smart city investments represents a significant regional opportunity.

Critical climate change adaptation and mitigation needs

The 2015 Paris Climate Change Agreement set out a targeted limit to global warming of two degrees Celsius. This limit implies significant global investment in economic transformation, retrofitting and new infrastructure (for example, low-carbon infrastructure, energy efficiency and improved water management); as high as US\$12.1 trillion over 25 years²⁰.

The investment requirement falls disproportionately to smart city initiatives, with a particular need to transform transport and energy sectors (estimated to account for 43 percent of total infrastructure needs in MENA²¹).

Investments in smart mobility and smart environment can play a key role in climate change adaptation (for example, improved urban resilience to climate change through business and citizen awareness) and mitigation initiatives (for example, through more efficient public transport systems and deployment of clean energy).

Many of MENA's cities need to counter specific climate change risks. These include vulnerability to sea-level rises for

Investments in smart mobility and smart environment can play a key role in climate change adaptation (for example, improved urban resilience to climate change through business and citizen awareness) and mitigation initiatives (for example, through more efficient public transport systems and deployment of clean energy).

coastal cities, and increasing summer temperatures. Indeed, some studies have suggested that summer temperatures in MENA could rise more than twice as fast as the average rate of global warming, even if the two degrees Celsius target is achieved. By 2050, such models forecast MENA will have 80 "extremely hot" days a year – up from 16 on average from 1986 to 2005. In the absence of significant change and investment, such outcomes could have a dramatic negative impact on economic wellbeing – particularly in cities with a relatively high dependence on tourism – not to mention the basic 'livability' of those cities.

'Lock in' effect of inefficient infrastructure investment

Since infrastructure investments are long-lived, failure to plan for the 'right' and agile investments can lead to the risk of 'lock in' to inadequate or underperforming infrastructure. This may undermine the economic, environmental and other benefits envisaged by the current rate of investment.

Smart city experience across the region varies considerably, and reliance on public-sector funding remains high

National and municipal governments in the GCC have launched significant initiatives to meet these challenges and opportunities. For example, the UAE's Green Growth Strategy is aiming to create 160,000 new jobs and boost GDP by 4–5 percent by

2030. Energy efficiency is projected to be the single largest generator of new jobs in the UAE, with 65,000 jobs by 2030²².

The GCC is also at the forefront of sustainable greenfield city developments. Saudi Arabia's ambitious plans for NEOM, billed as "a new blueprint for sustainable life" and including renewable energy, driverless vehicles and robotic automation, has a US\$500 billion investment commitment²³. New cities provide significant opportunities to advance smart infrastructure and technology solutions, as well as innovative commercial partnership solutions unconstrained by legacy issues and relationships.

However, there are high levels of variation in technology dissemination and adoption of digitalisation regionally. The 2016 Networked Readiness Index (NRI) from the World Economic Forum ranked the UAE as 26th, Saudi Arabia 33rd, Oman 52nd and Jordan 60th of 139 countries assessed. Singapore was first²⁴. There remains a long way to go to develop private-sector capabilities that can enable a true smart city ecosystem; for example, in 2017 just 8 percent of businesses in MENA had a digital presence, compared with 80 percent in the US²⁵. 

Ultimately, proving the credibility of policy announcements will be key to mobilising and developing the smart city ecosystem, and a greater role is needed for the private sector to act as project developers, sponsors and technology providers, and to provide funding and financing.

A range of practical interventions by GCC governments can enhance private-sector funding, financing and delivery of smart city projects

To deliver this, it is important to have a strategic plan to secure financing from different sources for different aspects of smart city programmes as required. Experience has shown that a majority of smart city funding and financing has come from public or blended public/private sources. This will likely reduce as smart city business models become more accepted by financiers, and their actual and perceived risks reduce.

There have been examples where private-sector finance has been very successfully deployed. In 2016, the US Department of Transportation awarded Columbus, Ohio, US\$50 million as the winner of its 'Smart City Challenge'. This helped reinforce Columbus's smart city plans, and attracted more than US\$360 million in private investment for the Smart Columbus Acceleration Fund.

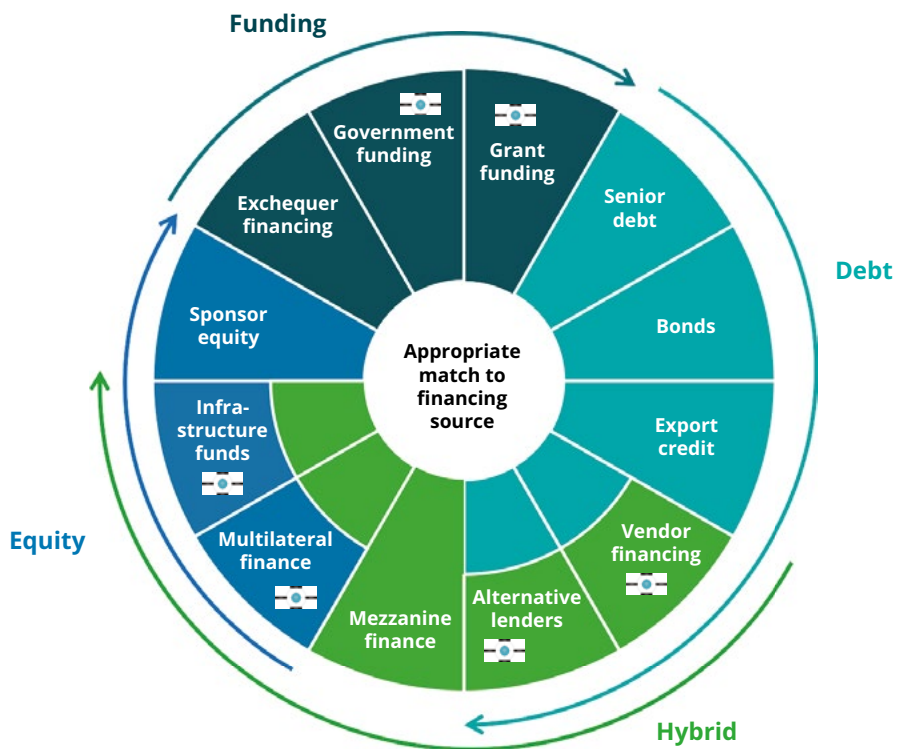
Smart city projects often come with unique and novel risks that challenge traditional infrastructure investors and contractors. These risks need to be mitigated to secure financing, and include:

- a limited ability to establish a revenue model for some public goods and to determine the value of data;
- a lack of certainty on returns because of new and untested technologies and business models; and
- disruption risks requiring shorter-term payback relative to traditional infrastructure investments.

In these instances, innovative and non-traditional revenue models for public services, such as savings sharing or subscription-based models, can support projects. Further, innovation in monetising existing investments – for example, through co-locating wifi and sensors with smart street lighting upgrades – can improve project viability.

However, many of the infrastructure investments required to enable smart cities are tried and tested, and in these instances the requirement for regional governments is to prove they have the institutional capacity to 'do business' with the private sector using more conventional financing tools.

Government can take steps to address underinvestment through using the government balance sheet to engage financial markets in ways that build the market and do not crowd out the private sector.



Cities such as Dubai have been able to achieve this through the development of mature institutions and governance systems that are seen to be reliable by the private sector. However, more needs to be done to build markets by removing obstacles such as overly onerous and inappropriate contracting terms and conditions and outdated procurement processes.

Government can also be more proactive in partnering with the private sector to deliver smart city initiatives, as well as other government entities and cities. Government is uniquely placed to mitigate certain project risks that the private sector cannot – including planning and regulatory risks – making it easier for the private sector to invest and bring innovation.

In the short and medium term, government can take steps to address underinvestment through using the government balance sheet to engage financial markets in ways that build the market and do not crowd out the private sector. For example, through co-investment and partnering initiatives and the use of special development funds, government can take proactive steps to leverage incremental private-sector investment.

Critical steps can be taken, as has been seen in other markets, to convince financiers that governments are able to meet smart policy commitments; this includes stable and long-term project pipelines, good communications, and ultimately provision of government funding to stimulate markets.

City governments also typically have a significant asset base that can be used to support incubator initiatives and projects. Understanding existing municipal assets, their value and potential role in the future smart city is critical for success. Green city bonds are also a rapidly growing financing mechanism globally; in 2017 alone, new green bond issuance grew by 78 percent to more than US\$155 billion worldwide²⁶. By issuing green bonds, government can demonstrate a clear investment commitment to the private sector.

The challenge for governments in the region will be their ability to drive integrated and co-ordinated solutions across a wide range of stakeholders, spanning multiple government entities, state-owned enterprises, and the private and non-profit sectors. In many cases, demonstrating an ability to ‘get things done’ with the private sector will be a critical step to building market confidence and capacity. ●

Deloitte has published extensively on topics relating to smart cities. A wide range of materials are freely available at <http://smartcity.deloitte.com/>. The following publications and resources relating to PPP and funding and financing of smart cities are recommended reading:

- Using public-private partnerships to advance smart cities
- The challenge of paying for smart cities projects
- Smart cities funding and financing in developing economies
- The Deloitte City Mobility Index
- Global renewable energy trends.

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The urgency of becoming a smart port

The global port industry is changing

World population growth continues to drive global seaborne trade volumes and port throughput (Figure 1²⁷). However, the global port industry is facing an increasing number of challenges including:

- **Shifting trade flows.** Changing global purchasing power dynamics, increasing productivity and competitiveness of source markets, and enhanced capabilities of ships are factors influencing global trade patterns and supply chains towards Asia. Also, as the climate changes, sea levels are rising and new trade corridors are opening (such as the Arctic route). Existing assets are threatened by these changes;
- **Declining rates.** The consolidation of shipping lines has resulted in increasing pressure on freight transport rates, as well as pressure on port tariffs. The increased competition is heading to create commercial challenges for ports and their operators; and
- **Increasing security compliance requirements.** Port security has become a priority for the global industry, and well-managed port security (ISPS²⁸) is a critical decision factor for shipping companies. In parallel, there is an increasing demand for end-to-end traceability and the use of common systems. Ports are required to adapt and leverage new technological and data-driven solutions.

The Middle East port industry is being challenged

In the midst of these global challenges and macro factors, the Middle East is faced with its own set of unique challenges.

Historically, a number of countries – especially in the Gulf region – have benefited from favourable conditions: strategic government support and availability of funds (primarily hydrocarbon-driven), availability of land, and economic growth. This had led to the successful development of a number of Greenfield ports.

However, these positive market conditions have resulted in considerable capacity development, and the Middle East region is now considered to have an oversupply of port capacity. Further, subdued regional economic growth and geopolitical tensions are affecting trade volumes. Finally, the existing competitive landscape is expected to shift further with the arrival of the GCC rail network and the new connectivity options.

These new challenges are resulting in considerable pressure on existing ports.

Port operators are having to reposition their offerings, and are more than ever required to become more competitive commercially, operationally and from a security point of view. In response to these challenges, the most advanced port operators are leveraging a combination of ‘smart’ and data-driven tools to improve their competitive advantage.

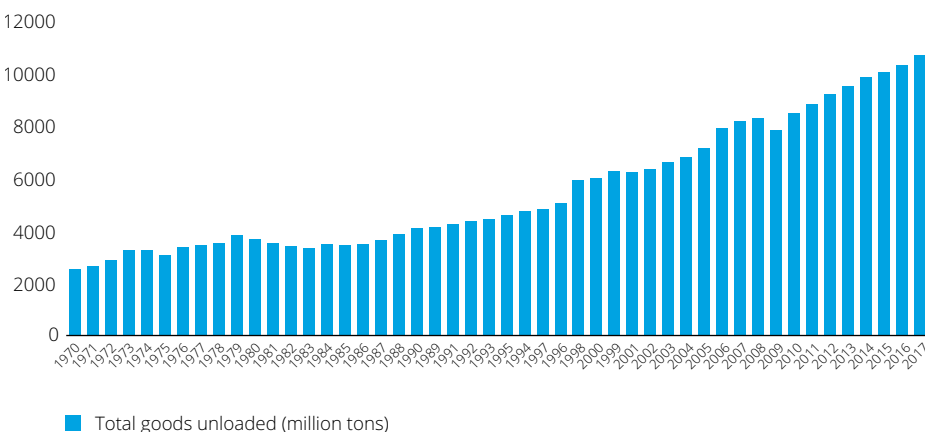
What it takes to become a ‘smart port’

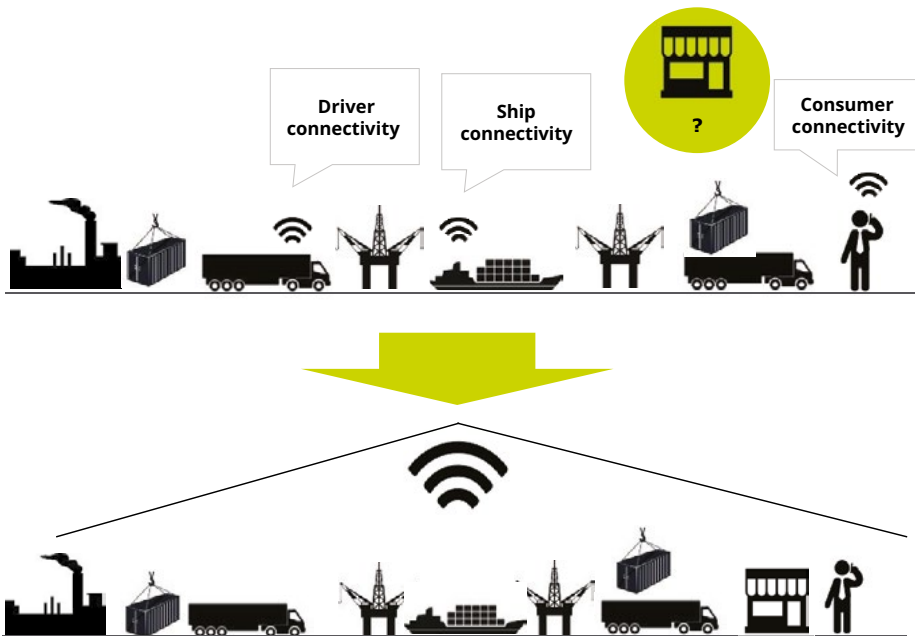
Technological advancements offer ports new opportunities to successfully face the above-mentioned challenges by transforming themselves into ‘smart ports’. The ongoing development of new technological solutions is creating an unprecedented disruption of the port industry. Automation is on the rise, with processes being streamlined and digitalised, and large data sets being stored and analysed to inform decision making. This transformation is opening a means of re-engineering the entire port industry. Its stakeholders, such as shipping lines, cities and customs authorities, are equally caught up in this disruption.

To achieve a successful transformation, ports need a deep understanding of the various solutions on offer. Globally and in the region, ‘smart port’ solutions pursue various objectives, the most important of which are:

1. **Enhanced business intelligence.** New data-analytics platforms can support ports by enhancing their business intelligence. They allow ports to take informed commercial and operational decisions, something Deloitte describes as becoming an ‘insight-driven organisation’ (IDO)²⁹. Becoming an IDO enables the embedding of analytics into the decision-making process, linked to an overarching business strategy, providing line of sight from business decisions to data, with technical solutions delivered to support this process;
2. **Greater co-ordination and integration.** Managing the internal and external traffic flows of port terminals requires co-ordination. New technological solutions can enable smart traffic flow planning and management (e.g. smart gates³⁰ allowing more efficient truck movements to and from the different port terminals, and container-taxis³¹, which are autonomous wagons managed by a control centre). There are also systems, such as blockchain³², that allow secure and ‘paper-free’ information-sharing across the port community, thereby fostering supply chain integration;

Figure 1. World seaborne trade





Ports need to be sophisticated in the way they choose to implement ‘smart port’ solutions – there is no ‘one size fits all’.

Ports need to be sophisticated in the way they choose to implement ‘smart port’ solutions – there is no ‘one size fits all’. Ports need to take a holistic business approach when assessing the adoption of smart initiatives. But it is not a case of adopting technology solutions for the sake of it. It is critical to understand the overarching business challenges, identify the range of solutions available and develop solid business cases to ensure return on investment. Then ports must ensure the implementation of the solutions is appropriately managed and considers the overall impact to the business, as well as track the benefits realised. ●

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3. Operational performance improvement.

Increased efficiency of robotics and analytics is driving automation. Port terminals are increasingly automated (e.g. unmanned water drones for the inspection of underwater hulls), limiting the need for human-controlled operations and their associated costs, as well as the risks of accidents. A number of innovations are also being explored on the sea-side, with self-steering ships for instance (where sensors replace the need for towing);

4. Asset management optimisation.

Smart asset/infrastructure management is becoming a new competitive advantage for port players. Capacity-sensing, fault-detection and resolution can be done more efficiently with the use of embedded or mobile sensors, Internet of Things (IoT) data analytics and data exchange for port cranes or ship control, and unmanned aerial vehicles (e.g. drones for port inspections). Digital twins of ports can reduce the asset management costs through the entire life cycle, and potentially extend the life of existing assets. Innovative solutions also enable reduced energy consumption;

5. Solution commercialisation.

Ports have the opportunity to pioneer technology and commercialise solutions. This may be applicable to systems (e.g. port community systems, port management systems) and to innovative operational solutions (e.g. Hyperloop³³); and

6. Safety and security improvement.

Being at the heart of global supply chains, ports need to be at the forefront of safety and cybersecurity. Illustrative examples include biometric access-control systems and surveillance systems (e.g. early-warning systems through video analytics and smart road controls within the port area).

There is no ‘one size fits all’

Ports need to re-invent themselves amid the shifting global industry landscape, regional challenges and the necessity to support national diversification mandates. Becoming a ‘smart port’ can allow them to take full advantage of their environment and stay ahead of competition, while improving safety and security. A range of solutions are available to allow more accurate planning, efficient operations and commercial benefits.

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