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AEC MIDDLE EAST REPORT

# Building in a time of transition: prioritising digital skills





# Summary

The world has changed immeasurably in the past two years. But even before the words “COVID-19 pandemic” were first uttered, the rise of automation and new technologies were transforming the world of work. Across the Middle East, nations continue to respond to new realities as they build economies less reliant on oil.

**They have had to adapt and transform.**

The effects of technological progress, together with the continuing impact of the COVID-19 pandemic and more sustainable futures, have all contributed to a pressing challenge: how to equip people and businesses with the skills and knowledge they need to be productive and participate in this new look economy?

The economic hit from COVID-19 caused disruptions to global economic activity and saw construction output fall across the region. The successful rollout of vaccination programmes played a part in ensuring these disruptions were temporary and activity levels rebounded in 2021. Analysis shows US$156bn worth of projects were awarded in the year across the MENA region[1]. With the AEC sector predicted to play a key role in realising nation and infrastructure plans, the region needs to maintain this momentum.

**But the economic potential of the sector – and indeed nation states – has to be powered by technology. However, there’s a widely reported skills mismatch across the region, particularly in this increasingly digitised world.**

**Focusing on the region’s pivotal construction sector, this report highlights how skills gaps could derail the transition to a world less reliant on oil.**

This report is for policymakers, educational institutions, employers and training organisations across the Middle East. It outlines some of the challenges and opportunities facing the sector which have the potential to place further pressure on an already fragile skills ecosystem. Drawing on industry exemplars, we propose some practical steps for the sector, business and academia.

# Building the vision for transition

It is a time of transition across the Middle East. Nations continue to seek to reduce their economic reliance on oil production, with increasing attention on building a more sustainable future and sectors such as tourism coming to the fore. A number of Gulf Cooperation Council (GCC) countries* have announced ambitious national transformation plans, such as Oman Vision 2040, Saudi Vision 2030 and Abu Dhabi Economic Vision 2030.

During 2020, a number of nations across the Middle East experienced greater contraction in their economies than the global average, largely due to the pandemic leading to falling oil revenues due to lockdowns and reduced output[2].

## Construction landscape

The economic hit from COVID-19 saw construction output fall across the region, in many cases more than the global trend. Qatar saw output slip by four per cent. UAE saw an estimated fall of almost five per cent. Oman's construction sector saw a double-digit drop in output[3]. Saudi Arabia bucked this trend seeing a 15% increase in construction volumes in 2020 (compared with a two per cent decrease globally)[4].

With construction predicted to play a key role in realising the nation visioning and infrastructure plans, increased construction output is anticipated across the region. MEED Projects tracked the 2021 total construction project awards value for Egypt as US$6.8 billion, KSA US$9.2 billion and the UAE US$8.3 billion[5].

Current projects include cultural, sporting and infrastructure including:

- Egypt has announced plans to develop roads and railway systems to connect nine African countries[6]
- Based on Saudi Vision 2030, in the next 20 years alone, the country is expected to spend US$1.1 trillion on the infrastructure sector[6]
- Abu Dhabi recently unveiled plans for the Natural History Museum Abu Dhabi. The new museum, currently under construction and due to be completed at the end of 2025, will be located in the emirate's Saadiyat Cultural District, which is establishing itself as a leading cultural centre[7]
- The FIFA World Cup 2022 has provided the biggest boost towards the growth of the construction sector in Qatar. The country has been on a spree to build a network of new hotels for the anticipated 1m visitors to the country[6]

* Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates



### View of economic growth across the region[2]

| Real GDP growth (annual per cent change) | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|---|---|---|---|
| Bahrain | 1.7 | 2.6 | -5.1 | 2.4 | 3.1 | 3.1 | 3.1 | 3.1 | 3.1 |
| Egypt | 5.3 | 5.6 | 3.6 | 3.3 | 5.2 | 5.6 | 5.7 | 5.8 | 5.8 |
| Iran | -6.0 | -6.8 | 3.4 | 2.5 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Iraq | 4.7 | 5.8 | -15.7 | 3.6 | 10.5 | 5.7 | 3.4 | 3.1 | 3.1 |
| Jordan | 1.9 | 2.0 | -1.6 | 2.0 | 2.7 | 3.1 | 3.3 | 3.3 | 3.3 |
| Kuwait | 2.4 | -0.6 | -8.9 | 0.9 | 4.3 | 2.7 | 2.7 | 2.7 | 2.7 |
| Oman | 0.9 | -0.8 | -2.8 | 2.5 | 2.9 | 4.2 | 2.9 | 3.3 | 2.6 |
| Qatar | 1.2 | 0.8 | -3.6 | 1.9 | 4.0 | 2.6 | 3.9 | 4.1 | 4.2 |
| Saudi Arabia | 2.4 | 0.3 | -4.1 | 2.8 | 4.8 | 2.8 | 2.8 | 2.8 | 2.8 |
| United Arab Emirates | 1.2 | 3.4 | -6.1 | 2.2 | 3.0 | 3.0 | 3.1 | 3.2 | 3.3 |
| Middle East (Region) | 0.5 | -0.1 | -4.0 | 2.7 | 4.1 | 3.0 | 2.9 | 2.9 | 2.9 |
| World | 3.6 | 2.8 | -3.1 | 5.9 | 4.9 | 3.6 | 3.4 | 3.3 | 3.3 |

> The UAE Government wants to ensure sustainable development while preserving the environment, and to achieve a perfect balance between economic and social development.
>
> **UAE Vision**

## A big role for digital technology

With regional budgets under increasing pressure from oil price uncertainty and from the impact of the COVID-19 pandemic, the vast amount of time, money and energy lost on wasteful construction practices represents a real threat to the region's development visions. Calls for reform in Middle East construction centre on the need for greater collaboration on projects, and the earlier completion of finalised designs[8].

Digitisation sits at the heart of the ambitious national transformation plans, as it is seen to play a role in increasing efficiency and improving productivity. The region's construction industry has opened up to the potential of digital technology to improve the way projects are planned and delivered.

"We also expect to see advancements to the application of digital technologies across the MENA construction industry as the technology industry continues its growth within the region. The decarbonization of projects will be systematic to the reliance and increased use of digital technology in the future. There are exemplary cases of the adoption of digital technology in construction processes within Saudi Arabia and the United Arab Emirates. The proven benefits to efficiency and cost management are expected to drive this further," JLL[1].

According to a report from MEED[9], there are three key areas where we can expect to see advanced digital technology reshaping construction in the Middle East:

1. More widespread adoption of artificial intelligence in the design process, where it can be used to generate multiple design solutions to meet specified outcome criteria.
2. A rise in the use of industrial manufacturing processes such as modular construction and prefabrication.
3. An increasing use of cloud-based project management and building design software to harmonise project team integration, collaboration and improve the way project teams work together.

Adoption of digital technologies within the construction industries varies across the region. Reportedly the UAE, Qatar and Saudi Arabia have made significant strides in the digital transformation of construction, whereas other countries in the region are proving slow to adopt digital solutions. The UAE pioneered the use of digital technologies in construction such as building information modelling (BIM) on landmark projects including Dubai's Museum of the Future, Dubai Metro, the Louvre Abu Dhabi and Expo 2020[8].

## Labour and skills challenges

If the region is to realise its ambitions, it requires a skilled workforce to meet ambitious construction projects and achieve the productivity and efficiency benefits associated with digital construction techniques.

As the region's youth enter the labour market in increasing numbers, unemployment is already high compared to global norms. The region also faces a huge challenge to bring more women into the workforce[10].

According to the World Economic Forum in 2017, there was growing evidence of a sizeable skills mismatch in the MENA region, as young people failed to acquire the skills needed to succeed in today's jobs, let alone those we will see in the future[11]. On top of this underlying challenge, one of the most significant impacts that the COVID-19 pandemic had on construction markets is on the availability of construction labour[12].

A recent report on digital skills within GCC countries revealed there was insufficient initiatives to improve the skills of employees at the entry level and as they rise up the ranks. There is also insufficient interaction between employers and educational institutions, which means that they are not collaborating to meet the skill requirements for the modern workplace[13].

According to the WEF many oil-based economies face challenges because capital and skilled nationals are heavily employed in sectors that are not the most innovative or subject to high long-term growth. For example, in the UAE the benefit from closing the skills gaps is a potential absolute gain of $4.3bn in GDP, which equates to just 0.6% of GDP; however, closing the skills gap could generate an additional 43,000 jobs by 2030[14].

Training providers and academia alike can play a role in closing the skills and jobs gaps. Courses and qualifications from organisations such as Autodesk, can offer governments and businesses ways to ensure the necessary knowledge and skills are developed and nurtured so together they can realise the region's ambitious infrastructure and nation plans.



## BIM: an in-demand skill

In recent years the application of BIM has become an in-demand digital skill which is transforming the construction sector, enabling the digital management and design of buildings and engineering processes. A recent report suggests construction must embrace a combination of all digital technologies including BIM, new visualisation tools, and big data analysis[15].

Governments across the globe are increasingly recognising the efficiencies that can be gained from adopting BIM; they view the use of BIM as a key to increasing innovation sector and addressing productivity declines[16,17].

Many governments are now making BIM mandatory for projects, defining targets for adoption. The United States adopted BIM as a requirement since 2008. BIM is mandatory in Dubai for projects over 20 storeys or larger than 200,000 feet and specialised buildings such as hospitals, education buildings, and government projects[18].

Like many markets, the barriers to usage across the region include the shortage of people specialised in BIM, the time and budget to conduct BIM planning and training, as well as the costs for its implementation.

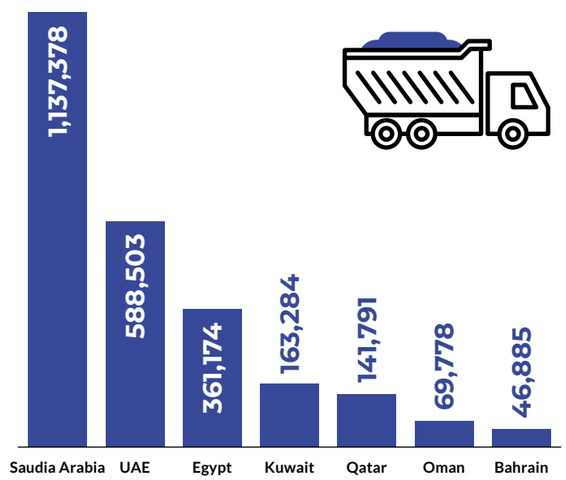
Basheer Mustafa, from Autodesk Authorized Training Center, Engineering Science Institute (Esi) in Saudi Arabia: **"After 18 months of disruption as a result of the pandemic, we foresee significant growth in the AEC sector in the Kingdom of Saudi Arabia in the next few years. This growth is being particularly driven by notable developments including some mega projects such as NEOM City, Red Sea Development, and reconstruction of the old city of Jeddah.**

**"These exciting and significant projects, and others across the Kingdom of Saudi Arabia, could benefit from the efficiencies that can be gained by the adoption of BIM. Adoption of BIM is growing across the region but it remains an in-demand skill."**

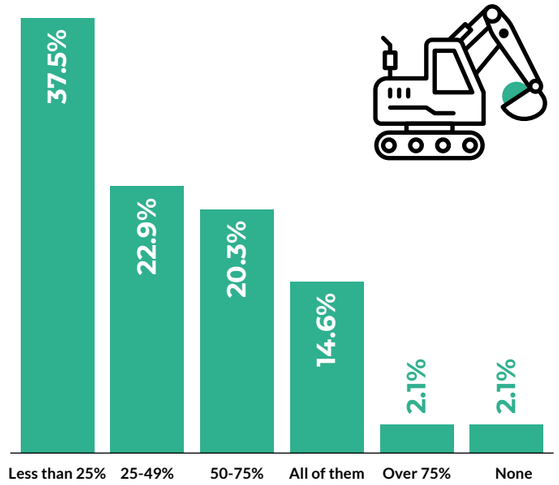
معهد علوم الهندسة للتدريب والتطوير
Engineering Science Institute For Training

### Meed construction industry survey 2021[8]

**Value of construction projects planned or underway in the GCC and Egypt ($)**




**What percentage of your projects involve advanced digital construction solutions**




> The country will have outstanding road, sea and air connections to global markets. Utilities (electricity, water and gas) and services (logistics, public transport and telecommunications) will be readily accessible and competitively priced, providing a stable base for businesses.
>
> **Bahrain Vision 2030**

# Learning from experience

Making an investment in developing skills has proven to reap rewards – at a business or individual level. Upskilling leads to meaningful work – good jobs – upskilling has the potential to trigger a virtuous circle: increased levels of skills lead to better jobs, and better jobs foster the further development of skills[14].

Employers across the AEC sector undertaking training on digital construction software, such as that from Autodesk, report seeing improved efficiency, better workflows, and being able to use software to its full potential. They also talk about the importance of certification to verify competency. Students and employees also highlight how relevant certifications are valuable for career development and reinforce knowledge and skills.

## CAD Masters, Autodesk Authorized Training Center, Middle East

**"Companies tell us our training speciality in BIM helps them save money, time and resources. Implementing BIM allows them to take on more projects and expand their market share.**

**"In addition, training has allowed many trainees to rise their positions in their companies or to join new companies with better positions."**

Operating in Egypt and across the Gulf, CAD Masters provides training, technical support, and services for engineering and graphics software. CAD MASTERS offers integrated solutions in CAD & BIM technology by implementing strategies based on commitment, quality, customer satisfaction, and high return on investment. It works with many large construction and manufacturing companies, as well as collaborating with universities and institutes across the region.

## GALAXY ACADEMY, Autodesk Authorized Training Center, Qatar

**"Autodesk BIM software is the leading software application in Qatar and authorized by government sector.**

**"Professionals and students request BIM software to develop their careers and to find new positions. Courses and qualifications lead to career enhancement, better positioning and better employment opportunities."**

GALAXY ACADEMY provides BIM Management Consultancy services for architects, engineers, contractors and owners with high-value services in each field of expertise, allowing it to develop multidisciplinary projects located anywhere in the world, where flexibility, adaptability to specific conditions and speed of delivery are essential conditions for success. As an Authorized Learning Partner, it supports construction companies, providing BIM training, coaching and hand-holding.



**15%**

increase in construction volumes in Saudi Arabia in 2020 (compared with 2% decrease globally)[4]

**100%**

Construction professionals surveyed said that digital technology improves project delivery[8]

# The case for upskilling[14]

**Closing the skills gap** across regions and industries

**Higher skilled workforce** better suited for a knowledge economy

Employees have an increased **sense of agency and well-being**

Workers have a better understanding of their **worker rights**, increased participation in **collective bargaining** and wider political activities


**Positive workforce engagement** with increased willingness to learn and self-develop

**Better and more inclusive employer** training opportunities for a stable workforce

**Stronger collaboration** between actors to foster continuous improvement and new approaches of training

**Creation of new training** to support the development of new sectors

**Source:** PwC analysis

# What needs to happens next?

This insight report highlights the challenges and opportunities facing the AEC sector across the Middle East. There are many implications for skills development – both on the near horizon and longer-term.

**There's already a skills mismatch across the region. This is only going to widen given the rising demand for skills as the world rebuilds after COVID-19. Alongside this, new skills are needed across the sector to aid the region's transition away from its reliance on oil.**

Employers, academia and industry across the region need to take collective responsibility to equip workers with the skills they need to make the most of the technology available today. The adoption of BIM is only going to increase across the region. AEC players across the region need to get ahead of the game, investing time in developing BIM skills today.

Together we need to invest in addressing the skills mismatch, to respond to the challenges facing us today and those coming down the line tomorrow.

For further information about KnowledgePoint and our role as the Autodesk Learning Partner Distributor for the EMEAR territory, or to find out about training local to you, visit:

**knowledgepoint.com/autodesk**

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