
Developing the UAE's Technology Sector

By **Martin Hvidt**

Series Introduction

In the past few years, many things have changed in the Gulf region. Oil prices have collapsed since mid-2014, the United States has redefined its policy towards the region and Turkey is emerging as the dominant power in the Middle East. Against this background, the aim of the UAE series of papers is to provide a comprehensive, interdisciplinary understanding of how the country is responding and adapting to the new reality. The papers cover different aspects of the UAE such as the economy, demographics, society, technology, foreign policy and security.

Abstract

The technology sector is of utmost importance to economic development. In the United Arab Emirates, the sector is large and sophisticated. However, it is dominated by imported technology, with solutions provided by international technology firms and operated by migrant technicians. This article explains why this has been the case and discusses how the country's indigenous technological capacity can be raised over the coming years.

On 20 July 2020, the United Arab Emirates (UAE) successfully launched a mission to Mars — the first for an Arab country. Onboard this unmanned mission was the “Amal” (Hope) orbiter, a sophisticated technological probe equipped to study the atmosphere and climate of Mars over the next two years.

But how could such an ambitious space programme be established within just six years? And that too by a country with an indigenous population of just about 10 per cent?

The key to the UAE's space programme was its ability to tap foreign expertise through partnerships. The probe was designed and built in partnership with an American laboratory, and it was launched from Japan by a Japanese rocket. In other words, the UAE took shortcuts to enter the exclusive club of space nations.

A related question is: what lies behind the UAE's interest in extraterrestrial exploration?

The space programme, and with it the Mohammed bin Rashid Space Centre, was established with the overall aim of propelling the country into a knowledge-based economy by setting both visible and aspirational goals for a younger generation of natural scientists.

The technology sector is critical for any country's economic development for at least three reasons. First, the application of technology vastly improves the productivity of the labour force. Second, the process of manufacturing technological products entails research and innovation and thus holds a range of spin-off effects for the economy. Third, there is the issue of dependency. As Samir Amin noted in his sharp analysis of capitalism four decades ago, countries that have the ability to produce the means of production, that is, the ability to produce the machines that are used in the manufacturing process are far less dependent on other countries than countries that do not have such a capability.¹

¹ Samir Amin, *Accumulation on a World Scale: A Critique of the Theory of Underdevelopment* (New York: Monthly Review Press Classics, 1974).

The impact of technology on a country's growth cannot be underestimated. This point is underscored by the famous Solow growth model, which states that about half of all historical growth can be explained by the advancement in technology.² It follows that development from an agrarian to an industrialised economy, to an information economy, and lastly to a knowledge-based economy necessitates that society adopt increasing levels of technology.

The Technology Sector in the UAE

The technology sector in the UAE is under rapid development, judging by the value of the sector and of the solutions implemented. Estimated at US\$8 billion, the country's domestic information technology (IT) market is expected to grow 5 per cent annually between 2017 and 2022, according to the International Data Corporation (IDC).³

Seen from a consumer's perspective, the UAE's technology sector is doing fine. Mobile devices, personal computers, wearable technology, cameras, televisions, sound systems, home appliances, etc, are widespread in society. Just pay attention to any group of Emirati youngsters, and you will find them armed with the newest laptops, phones and wireless earphones. Or stroll through any mall in the country, and you will find megastores selling a wide array of electronic gadgets. Even though most of these stores, especially those in Dubai, target international customers, they are usually teeming with local buyers.

The local population is well off and spends readily on electronic gadgets. While estimates differ, the UAE is known to have among the highest smartphone penetration rates in the world (91 per cent).⁴ Data from the Telecommunications Regulatory Authority (TRA) support this estimate. Among the nearly 9.9 million inhabitants in the UAE, each holds 2.2 active mobile subscriptions.

The smartphone has become the day-to-day communication tool not only among friends, pizza parlours, second-hand dealers and schools but especially also with public authorities such as the Dubai municipality and federal government bodies. A mobile phone number has become a unique identifier in the public sector, which means that speeding tickets, renewal of work permits and driver's licences, health notifications, payment notices for parking, outcomes of applications to the public sector, etc, are all sent by phone.

This is the outcome of a deliberate attempt by the government to digitalise the public sector. First, a policy that emphasised eGovernment was implemented in the late 2000s. Later, in 2013, this policy was enhanced by the mobile governance initiative, known as the mGovernment initiative, which aims to make all priority services available through websites and mobile phone applications.

However, while consumer technology usage is widespread in the UAE, deeper knowledge of such technology is somewhat lacking. At a presentation in 2015 for new faculty members of Dubai's Zayed University, Ali Alsloom aka "Ask Ali", a Dubai-based cultural interpreter, public speaker and newspaper columnist, spoke of his fellow Emiratis' superficial knowledge of technology thus: "You all think that the reason most Emiratis have more than one phone is that they carry a phone for various different uses, eg, personal, business, family. However, that is not the case. The reason is simply that we do not understand the devices well enough to transfer address lists, data and pictures from an older phone to our new ones, so we keep them all, creating a mess for ourselves."

While this is at best anecdotal evidence, there are good reasons to believe that this characterisation holds true as a generalised picture of the technological capabilities of Emirati nationals. This is because, as we will see below, the UAE, like the other oil-rich Gulf states, failed to build strong incentives for its people to skill or upskill themselves technologically.

² Michael P Todaro and Stephen C Smith, *Economic Development*, 12th ed (Harlow, England: Pearson/Addison-Wesley, 2015), 128–29.

³ "UAE's \$8 billion tech industry presents extensive growth opportunities for Chinese businesses", Businesswire, 20 July 2018, <https://www.businesswire.com/news/home/20180720005009/en/UAE%E2%80%99s-8-Billion-Tech-Industry-Presents-Extensive>.

⁴ "UAE has among the highest percentages of smartphone penetration in the world", Advancesoft.ae, <https://www.advansoft.ae/blog/smartphones>.

Structural Barriers

The present state of the technology sector in the UAE is derived from its historical context. Five points are noteworthy. First, we must recall that from a developmental perspective, the UAE is a latecomer. As pointed out by Alice Amsden, the first industrialisers developed through the inventions they came up with, the second generation of developers both by inventions and innovations, while the later developers advanced not by inventions or innovations but by imitation or learning, that is, by importing and using technology developed elsewhere that was readily available on the international market.⁵ Among the last category, we find the UAE and the other oil-rich Gulf states. When the export of oil began in the 1950s–1960s and revenues became abundant, the rulers of these oil-rich states responded to the expectations of rapid development by opening the sluice gates for the import of readily available technology. As such, appropriation of technology by learning/imitation became institutionalised, which meant that little emphasis was placed on technological innovation and domestic production of technology.

A second barrier to building a technological capacity among the UAE population was the rentier nature of the economy. Deriving income from the export of oil depended only to a limited degree on the hard work and knowledge of the population. Even after the nationalisation of the oil business in the Gulf in the 1970s, oil extraction was undertaken with the foreign technology brought in by international companies, which used skilled foreign engineers, and only a small fraction of the local population for blue-collar work. The result is that the export of oil fostered large numbers of management jobs but few jobs of a technical nature for the local population.

Third, the fact that income in the Gulf countries was primarily derived from trade, apart from oil, meant that the state did not have any serious incentive to stimulate the growth of a viable industrial sector. As such, the productive capacity of the UAE continues to be concentrated in a limited range of sectors and products (eg, building materials) while all other consumer products are imported. In other words, the economy remains an undiversified, service-oriented economy with relatively little manufacturing.

A fourth element that has contributed to the lack of an indigenous technology base in the UAE is the general lack of focus on increasing productivity in the private sector through the application of technology. As noted by the International Monetary Fund (IMF), the existing development model in the Gulf Cooperation Council (GCC) countries favours the employment of low-wage foreign workers in the private sector instead of productivity-enhancing technologies. Relative to other countries, productivity gains in the GCC countries have contributed little to growth since 1970. Rather, growth has been attributable to “hiring more hands” and thus neither to capital nor total factor productivity.⁶

Finally, the UAE’s education sector has acted as a catalyst for technological knowledge only to a limited extent. The education system generally has not prepared and stimulated the younger generations to pursue careers in the fields of the natural or technical sciences. More significantly, owing to the abovementioned structural factors, there is a general lack of incentive when it comes to wage levels, status and job prospects for pursuing careers in the technical field, compared to pursuing the management track.⁷

The combination of these five elements has created a vicious circle, which has kept the technological capacity of the UAE’s native population at a relatively low level, compared to other countries at a similar developmental stage.

Piggybacking on Imported Technology and Technology Workers

However, this does not imply that the UAE suffers from a lack of technological knowledge, for this knowledge has so far been imported, either embedded in expatriate workers or through international IT firms. At present,

⁵ Alice H Amsden, *Asia's Next Giant: South Korea and Late Industrialization* (New York: Oxford University Press, 1989), 4.

⁶ *Regional Economic Outlook: Middle East and Central Asia*, International Monetary Fund, October 2017, 25.

⁷ Martin Hvidt, “The State and the Knowledge Economy in the Gulf: Structural and Motivational Challenges”, *The Muslim World* 105, no. 1 (2015): 43.

the population of the UAE stands at nearly 9.9 million. Only around 1 million of these are Emirati citizens, the remaining being migrants.⁸

Among the migrants, an estimated 25 per cent are highly skilled.⁹ These are expatriates who are recruited precisely because they fill the gaps in the stock of local knowledge. Among them, we find large groups of IT technicians, engineers and support staff — very often of Indian origin — who maintain and further develop IT systems, both in the public and private sectors.

On top of importing technology workers, the UAE, like many other countries, welcomes international IT firms to market and sell their products in the country. The UAE is also an eager user of the services of international consultancies that help to develop software and implement digital solutions for their worldwide customers. Among these firms are the technology giants such as Microsoft, Oracle, SAP, Symantec Corporation, IBM, Accenture, Infosys and Adobe.

Microsoft, for example, is particularly active in promoting its cloud-based solutions. The company increased its commitment to the UAE market in June 2019 by opening two data centres in the country. These data centres, the company said, were intended to better cater to the needs of its business customers, but their purpose evidently was also to bring the company into a position where it can become the key provider of cloud-based technologies for the public sector.¹⁰ A specific example of the company's success in this respect was seen in June 2019, when Microsoft and the Abu Dhabi Smart Solutions and Services Authority entered into a memorandum of understanding that committed the former to deliver “excellent government solutions”. Furthermore, Microsoft is to provide training in its key systems for 240 government employees.¹¹

Notwithstanding the lack of indigenous capability, UAE authorities have launched various technology initiatives to promote the use of technological solutions in the country. One notable example in their efforts to foster a developer community of technology firms is the Dubai Internet City, established in 2000. It is set up as a free zone. Besides hosting a range of the largest international IT firms like HP, Microsoft, Oracle and IBM, it hosts around 1,600 medium-sized or smaller IT innovators and firms that provide digital solutions to the UAE and neighbouring countries.¹² But here, like elsewhere in the Gulf, the professional jobs in the technical field are mainly held by expatriates.

So, if a country has the financial wherewithal to hire experts from outside and buy expertise and solutions from the foremost companies in the world, there is no shortage of either IT or other technical solutions. As such, a country can at the same time have super-advanced IT and communication services while the technological capacity of its own population remains shallow.

In the case of the UAE, this situation is reflected in the Knowledge Economy Index published by the World Bank, which ranks countries on four parameters: economic regimes, innovation, education and information and communications technology (ICT). The most recent version of the index ranks the UAE at 42nd place out of 146 surveyed countries. The country is ranked far higher, namely in 13th place, when it comes to the state of ICT, bringing it on par with countries such as Austria or Denmark. At the same time, it is ranked quite low, ie, at 55th place, on the education index, on par with countries such as Moldova or Mongolia.¹³

⁸ “UAE Population and Demographics”, DubaiOnline.com, n.d., <https://www.dubai-online.com/essential/uae-population-and-demographics/>.

⁹ Martin Hvidt, “Exploring the Nexus between Highly Skilled Migrants, the *Kafala* System, and Development in the UAE”, *Journal of Arabian Studies* 9, no. 1 (2019): 25.

¹⁰ “Introduction to Cloud in UAE”, Microsoft.com, n.d., <https://www.microsoft.com/mea/trustedcloud/uae/>;

“UAE Cloud in Public Sector”, Microsoft.com, n.d., <https://msmea-staging.azurewebsites.net/mea/trustedcloud/uae/public-sector.aspx>.

¹¹ “Abu Dhabi Smart Solutions & Services Authority signs MoU with Microsoft to establish ‘Cloud Centre of Excellence’”,

Microsoft.com, 15 April 2018,

<https://news.microsoft.com/en-xm/2019/04/15/abu-dhabi-smart-solutions-services-authority-signs-mou-with-microsoft-to-establish-cloud-centre-of-excellence/>.

¹² “The Leading Tech Economy in the Region”, website of Dubai Internet City, <https://dic.ae/>.

¹³ “Knowledge Economy Index”, <https://knoema.com/aomssce/knowledge-economy-index?location=United%20Arab%20Emirates&indicator=Knowledge%20Economy%20Index>.

Increasing the UAE's Technological Capacity

Although imported technology and IT technicians form the backbone of many of the country's high technology initiatives, a range of high-profile and high-cost initiatives are being undertaken to encourage the development of an indigenous technological capacity in the UAE, such as the aforesaid space programme, which has aims of nurturing "a knowledge-based economy and a sustainable scientific society" and encouraging young Emiratis to become "pioneering leaders in science and technology".¹⁴ Another set of initiatives involves establishing smart cities, notably the highly publicised Masdar City project on the outskirts of Abu Dhabi. The common theme of the smart cities is to use state-of-the-art technology like 5G cellular technology, artificial intelligence, machine learning, the Internet of Things and virtual reality, and renewable energy to promote sustainable development and environmentally friendly communities. The smart cities initiative, too, represents efforts to raise awareness of the benefits of IT technology and in the long run to nurture local talent, both as users and as suppliers of these technologies.

While such high-profile and high-cost initiatives undoubtedly help to catalyse the development of a vanguard of tech-savvy young Emirati nationals, the government could embark on a much broader and simpler approach to increase the technological skill levels of the indigenous population.

All international evidence points to the fact that labour shortages or increased labour costs lead to a focus on increasing productivity. One notable example comes from the Vietnam War period, when 2.25 million young men from rural communities in the United States had to serve in the army, causing labour shortages on farms. These shortages forced farmers to become more efficient by concentrating their operations on one main crop and investing in larger, more specialised machines.¹⁵ Such productivity enhancements align perfectly with the recommendations from the IMF that the Gulf countries focus on raising productivity per worker through the application of technology.

Furthermore, it is imperative that the education system in the UAE be reformed so that science and technology become attractive study subjects and young people can be prepared to become competitive and productive members of the workforce. Within society at large, the value system needs to change for young people to be persuaded to pursue educational attainment and professional qualifications.

About the Author

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¹⁴ Official website of UAE Space Agency, <https://space.gov.ae/Page/20123/20129/About-Science--Technology>.

¹⁵ Wessels Living History Farm, <https://livinghistoryfarm.org/farminginthe50s/farm-life/vietnam-war/>.