

Regional good practices

Accelerating innovation,
entrepreneurship and digital
transformation in the Arab States region



Arab States region

**Regional good practices:
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entrepreneurship and
digital transformation in
the Arab States region**



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Foreword



As countries around the world continue to grapple with the devastating effects of the COVID-19 pandemic, they are banking on digitization to build more sustainable and resilient economies and societies in addition to connecting the unconnected and bridging digital divides.

An integral part of this digitization process is to establish enabling digital innovation ecosystems. This is particularly important in the Arab region due to the fact that around 34 per cent of the region's total population is between the ages of 15 and 34, the prime age for innovators and entrepreneurs.

Fortunately, in recent years a range of good practices emerged from the Arab States region to establish digital innovation ecosystems. This report highlights many of those good practices in an effort to share this experience and raise awareness to all stakeholders in the region and beyond. I am confident that the resources and insights shared in this report will inspire Member States and other stakeholders in the region to advance their efforts to create thriving digital innovation ecosystems.

A handwritten signature in black ink, consisting of a large, stylized 'D' followed by a series of loops and a horizontal line extending to the right.

Doreen Bogdan-Martin
Director, ITU Telecommunication Development Bureau

Executive summary

The Arab States region appears to be ‘the most unequal region in the world’.¹ Some Arab countries boast exceptional ICT ecosystems and are well advanced on the path to digital transformation, whereas others lag far behind in terms of basic infrastructure and education and skills. This digital divide and the resulting lack of uniformity make it hard to capture region’s status and to offer any specific recommendations with a view to establishing thriving digital innovation ecosystems region wide.

The intertwined role of entrepreneurship, innovation and technology is fuelling a paradigm that calls for new thinking and insights. This report will attempt to understand this paradigm at the regional level, using international indices and comparative studies, so as to equip States with the capacity to act at the national level. Some countries of the Arab States region occupy leading positions when it comes to certain aspects of innovation, entrepreneurship and technology, while others may lie at the bottom of the ranking.

ITU’s research on innovation reveals that there is a growing ‘digital innovation divide’ affecting many countries worldwide. ICT-centric innovation ecosystems have a critical role to play in fostering digital transformation, leading to economic inclusion, positive externalities and sustainable growth for communities, cities and countries. In many countries, this ecosystem of entrepreneurs, entrepreneurial support organizations, academics, public- and private-sector stakeholders and financiers is struggling to provide the necessary ingredients to fuel a positive digital transformation in society.

The Arab States region has many good practices that can be used to accelerate digital transformation and serve as a basis for better policies in countries where gaps have been identified. By replicating and amplifying good practices in the region, other countries can strengthen their digital innovation ecosystems and follow in the footsteps of the global leaders. It is therefore imperative to share regional and global knowledge, expertise and experience.

This report aims to showcase the digital transformation in the Arab States region as further accelerated by entrepreneurship-driven innovative practices. At the time of writing, the world is still grappling with the negative effects of the COVID-19 pandemic. The report explores how the pandemic has served to drive innovation, entrepreneurship and digital transformation and how societies around the world will embrace this change to a ‘new normal’. The governments of the Arab States region have displayed a great deal of political will to help soften the impact of coronavirus outbreak. New policies and laws have been adopted to enable the new normal. All those initiatives will serve as a stepping stone to an even better environment for the digital innovation ecosystem.

The report is divided into five parts: an introduction, followed by two sections and two appendices.

The **introduction** summarizes the key findings covered in the report and sets out the report’s objectives. It also provides an overview of the role of innovation in sustainable economic and

¹ Facundo Alvaredo et al. International Association for Research in Income and Wealth. [Measuring inequality in the Middle East 1990-2016: The world’s most unequal region?](#) *The Review of Income and Wealth*.

social development, background information about ITU's work on digital innovation, the key challenges to innovation in the Arab States and steps that regional Member States can take to turn their countries into thriving digital innovation ecosystems. The growing digital innovation divide is also touched upon. The introduction ends by stressing the imperative need to strengthen digital innovation ecosystems in the region.

Section 2 provides regional context through *innovation policy monitors* for the *engines of growth* and *digital transformation enablers*. It sets the stage for a comparative analysis among countries using existing indices, and provides insights into the current status of the enabling environment for innovation capacity at the regional level.

Section 3 highlights *good practices* from the Arab States region. It provides a quick snapshot of 12 practices, giving the reader an idea of whether or not a given practice is relevant or applicable to the challenges and goals of their own ecosystem by indicating which of the *building block(s) of ICT-centric innovation* (innovation dynamics, innovation capacity and ICT innovation in key sectors) it can impact on. A case study may be of interest for one, two or all three of the building blocks of ICT-centric innovation.

Appendix A explains the report's *methodology*. It also defines the common language used in the report, in order to help readers understand the research and analysis process. Understanding the research methodology is key to deciphering the relative rankings of countries' innovation capacity. This appendix also explains the key building blocks needed to accelerate transformation: *innovation dynamics, innovation capacity and ICT innovation in key sectors*.

Appendix B provides 12 *sample case studies* from the practices identified in the report. Each demonstrates how a barrier has been successfully addressed, and its potential to be turned into a working good practice in any ecosystem. The full case studies are available on request.

Overall, the report brings to light many significant and fascinating initiatives supporting digital transformation and the ecosystem which breeds innovation within the Arab States region, cementing the region's position as innovation and knowledge hub. Some of these initiatives can serve as an inspiration for other regions in the world. Moreover, on account of its demographic make-up and trends and the positive cultural attitude towards entrepreneurship within the region, the Arab States region is a fertile breeding ground for young entrepreneurs, although many brilliant ideas remain at the grassroots level and do not come to fruition owing to the lack of an enabling ecosystem to nurture new ideas and innovation in some of the countries.

Table of contents

Acknowledgements	ii
Foreword	iii
Executive summary	iv
List of tables and figures.....	viii
1 Introduction.....	1
2 ICT-centric innovation policy in the Arab States	5
2.1 Regional context	5
2.2 Impact of COVID-19	5
2.3 Arab States policy monitor - Three engines of growth	7
2.4 Review of ICT-centric policies and strategies	13
2.5 Arab States policy monitor - Enablers of digital transformation	23
3 Good practices accelerating digital transformation	38
3.1 Agence de Promotion de l'Industrie et de l'Innovation (Tunisia)	38
3.2 Dubai Future Foundation (United Arab Emirates).....	38
3.3 Industrial Modernization Centre (Egypt).....	39
3.4 Jordan Enterprise Development Corporation (Jordan).....	39
3.5 Morocco Climate Innovation Centre (Morocco)	39
3.6 Mosul Space (Iraq)	40
3.7 Agence Nationale de Promotion et de Développement des Parcs Technologiques (Algeria)	40
3.8 Palestinian Information Technology Association (State of Palestine),	40
3.9 Qatar Science and Technology Park (Qatar)	41
3.10 Smart Dubai 2021 (United Arab Emirates)	41
3.11 Syria Digital Lab (Syrian Arab Republic)	41
3.12 World Innovation Summit for Education (Qatar)	42
Appendix A – Methodology.....	43
A.1 Research goals and methods	43
A.2 Monitoring ICT-centric ecosystems	43
A.3 Monitoring the enablers of digital transformation	45

A.4	Monitoring the Ecosystem Maturity Map.....	46
A.5	Monitoring good practices.....	48
Appendix B – Full case study samples.....		53
B.1	Agence de Promotion de l’Industrie et de l’Innovation (API) (Tunisia).....	53
B.2	Dubai Future Foundation (United Arab Emirates).....	55
B.3	Industrial Modernization Centre (IMC) (Egypt).....	57
B.4	The Jordan Enterprise Development Corporation (JEDCO) (Jordan).....	59
B.5	Morocco Climate Innovation Centre (MCIC) (Morocco).....	61
B.6	Mosul Space (Iraq).....	63
B.7	Agence Nationale de Promotion et de Développement des Parcs Technologiques (ANPT) (Algeria).....	66
B.8	Palestinian Information Technology Association of Companies (PITA) (State of Palestine).....	68
B.9	Qatar Science and Technology Park (QSTP) Qatar.....	70
B.10	Smart Dubai 2021 (United Arab Emirates).....	72
B.11	Syria Digital Lab (SDL) (Syrian Arab Republic).....	75
B.12	World Innovation Summit for Education (WISE) (Qatar).....	77

List of tables and figures

Tables

Table 1: Three engines of growth.....	7
Table 2: Technological dimension of innovation - Availability of data	9
Table 3: Arab States policy monitor - ICT-Centric Innovation Performance monitor	11
Table 4: ICT-centric innovation ecosystem strategies and policies in the Arab States region	14
Table 5: Gross enrolment in tertiary level education and literacy rate in adult population (15-64 years old) (%)	28
Table 6: Societal values about entrepreneurship in Arab countries	36

Figures

Figure 1: IDI score evolution 2016-2017	10
Figure 2: Internet access and network coverage as a percentage of population	13
Figure 3: Evolution of the quality of overall infrastructure in Arab countries.....	25
Figure 4: Readiness sub-index	26
Figure 5: Mobile-cellular (left) and fixed-broadband (right) subscriptions per 100 inhabitants, by region, 2005-2018 (ITU estimates)	27
Figure 6: Penetration of basic, standard and advanced ICT skills as a percentage of population for selected Arab countries (%), 2019	31
Figure 7: Access to capital and finances.....	32
Figure A.1: The three engines of growth.....	44
Figure A.2: The entrepreneurial lifecycle.....	47
Figure A.3: Colour-coded Ecosystem Maturity Map for Country A	48
Figure A.4: The Good Practice Canvas	49

1 Introduction

About the report

This report provides an overview of the comparative innovation capacity of the Arab States region through ICT-centric innovation policy monitors, and an insight into how good practices can strengthen capacity to mainstream ICT innovation into national development agendas. It showcases a number of countries that display exemplary innovation practices and occupy leading positions in all three ecosystems (entrepreneurial, innovation and technology ecosystems), and looks at other countries of the region which lag behind in all three ecosystems as well as in terms of hard and soft infrastructure.

To understand this divergence, the report introduces two ICT-centric innovation policy monitors: the 'Three Engines of Growth' monitor and the 'Digital Transformation Enablers' monitor.

The report notes that there are many good practices in the region fuelling the entrepreneurial journey. Each practice presented in the report was analysed on the basis of its impact, in a third ICT-centric innovation policy monitor, the 'Ecosystem Maturity Map' monitor. Each stakeholder group, at each of the five stages of the entrepreneurial journey, is assessed by its level of engagement in order to gauge the maturity of the ecosystem. For example, the first stage of the journey for entrepreneurs is 'entrepreneurial interest', while for the public sector it is having a 'vision and strategy'. This monitor enables stakeholders to visualize the maturity of the ICT-centric innovation ecosystem and identify which practices to keep, which must be improved and which to replace.

Many of the traditional national innovation agencies responsible for guiding innovation dynamics can benefit from expanding their mandate to include building innovation capacity and integration of ICT innovation into key sectors; otherwise, they will be restricted to relying on other ecosystem stakeholders.

The importance and relevance of showcasing good practices to be replicated or scaled up (as well as knowing which bad practices to replace) for creating a thriving and mature ICT-centric ecosystem is made clear throughout this report. However, understanding digital innovation and learning about the importance of good practices is only the first step on the innovation journey.

Vibrant ecosystems that are the envy of other countries require a culture where stakeholders organically leverage existing resources and continuously update their policies and programmes to remain competitive. Building an innovation culture at the country level is a journey. Ecosystems go through stages of development, and in these stages every stakeholder has actions they must take and roles they must play.

To obtain a holistic assessment of a particular community's or country's capacity to innovate with ICTs, further engagement is necessary, especially to be able to map its context. This report does not, for example, offer an analysis of the Ecosystem Maturity Map monitor, nor does it offer country-level details on the Ecosystem Maturity Map.

ITU's Digital Innovation Framework can offer the tools first highlighted in its 2017 report on good practices¹ and updated in the 2020 edition (*Bridging the Digital Innovation Divide: A toolkit for developing sustainable ICT-centric ecosystem projects*).² Publications such as this enable ITU to share its expertise with ecosystem builders. Interested stakeholders may request technical assistance to develop a national profile (see, for example, South Africa's *ICT-centric innovation ecosystem snapshot*)³ or map two of the policy monitors at the country level, through either a holistic country review (see, for example, *Moldova's ICT-centric innovation ecosystem*)⁴ or a digital innovation profile (see, for example, *Digital Innovation Profile - Montenegro*).⁵ Stakeholders can also engage in capacity-building courses, such as the *Ecosystems 101* series, where they receive training and certification on ITU's innovation framework.⁶

This report has some shortcomings. First, some of the information provided may be outdated, as practices and current data are difficult to obtain through desktop research. Secondly, despite attempts to conduct surveys on good practices, response rates were insufficient to be sure to capture all relevant practices for the region. Lastly, additional qualitative and quantitative research could be conducted to complement the information in this report, although this goes beyond its scope.

The report is, nonetheless, a starting point for regional stakeholders to understand the dynamics of ICT-centric innovation. For technical assistance from ITU in developing a thriving ICT-centric innovation ecosystem in your country, contact ITU-RO-ArabStates@itu.int.

Background

In the digital age, technology use and innovation are ubiquitous. However, countries and regions with limited capabilities do struggle, and require support in order to be competitive in the global market. Entrepreneurs who find opportunities that are worth exploring must undertake a journey to turn these opportunities into businesses and deliver products and services to the market. A successful journey results in entrepreneurs delivering problem-solving innovations to their communities and in regional or global markets. Nevertheless, this success depends on many enabling building blocks - talent, infrastructure, capital, market, culture, policies and an overarching vision and strategy alignment that provide the key ingredients of robust and vibrant digital innovation ecosystems.

In many regions, innovators are still struggling. The ingredients needed to facilitate this journey are often missing. Without the necessary support, they are unable to compete on a regional scale, let alone globally, thereby contributing to a growing digital divide both within and between countries.

To close this gap, it is necessary to provide stakeholders such as policy-makers, private-sector executives and entrepreneurs with evidence-based guidance relevant to their regions, enabling them to design innovation policies and programmes for their organizations and countries.

¹ ITU. Innovation. [Bridging the digital innovation divide: A toolkit for strengthening ICT centric ecosystems](#). Geneva, 2017.

² ITU. Thematic reports. Innovation. [Bridging the digital innovation divide: A toolkit for developing ICT centric ecosystem projects](#). Geneva, 2020.

³ ITU. Innovation. [Digital Innovation Profile - South Africa](#). Geneva, 2018.

⁴ ITU. Innovation. [ICT-centric Innovation Ecosystem - Country review: Republic of Moldova](#). Geneva, 2017.

⁵ ITU. Country profiles. [Digital Innovation Profile - Montenegro](#). Geneva, 2020.

⁶ ITU. ITU Academy. [Innovation Ecosystem 101 series](#).

Digital innovation is essential for a country to remain competitive in the global market. ITU's Thematic Priority - Digital Innovation Ecosystems⁷ identifies and amplifies relevant good practices that can serve to build countries' capabilities to be thriving members of the emerging knowledge economy.

Objectives

This report builds on the first regional report of this kind, *Accelerating digital transformation good practices for developing, driving and accelerating ICT-centric innovation ecosystems in Europe*, published in 2018.⁸ It focuses on good practices from Arab States which can be examined, replicated and adapted to local contexts in order to develop thriving digital innovation ecosystems. Following on from the earlier report for Europe and bolstered by enhancements to ITU's Digital Innovation Framework, the present report, on *Regional good practices: Accelerating innovation, entrepreneurship and digital innovation in the Arab States*, is part of a series that will distil good practices from each ITU region. Sharing and implementing good practices is crucial to improving the performance and productivity of entrepreneurship-driven innovation.

The priorities of ITU members make it important to provide evidence-based guidance for each region on how to measure their innovation capacity and change direction where needed. This report provides these insights, as well as good practices which can be modified and replicated by champions in their own communities so as to help mainstream vibrant digital innovation ecosystems conducive to an accelerated digital transformation of society.

The report delves into good practices from each country, with an emphasis on target stakeholders, governance structures, resources and the partnerships built, as well as the main achievements of each good practice. The section on good practices highlights the role of innovation champions and their inspiration behind driving change, wherever they are located.

The report offers an overview of the opportunities inherent in accelerating digital transformation in the countries of the Arab States region. It provides an understanding of the critical enablers and linkages needed to foster ICT-centric innovation in the region, and examines good practices that can serve as a basis for strengthening digital innovation ecosystems. It also promotes regional and international cooperation, and partnerships in building ICT-centric innovation ecosystems.

Mandate

With innovation increasingly prioritized by policy-makers, and having regard to the outcomes of the World Telecommunication Development Conference (Buenos Aires, 2017) (WTDC-17) and the ITU Plenipotentiary Conference (Dubai, 2018), the ITU Telecommunication Development Bureau (BDT) has embraced innovation as one of the priorities of the ITU Development Sector (ITU-D).

⁷ ITU. Thematic priorities. [ITU-D Digital Innovation Ecosystems - Unlock the potential to accelerate digital transformation of society](#).

⁸ ITU. ITU-D Innovation. Regional Reports/Europe. [Accelerating Digital Transformation: Good practices for developing, driving and accelerating ICT-centric innovation ecosystems in Europe](#). Geneva, 2018.

At the Plenipotentiary Conference in Dubai, the ITU membership established the *Connect 2030 Agenda for Global Telecommunication/ICT Development*, a shared global vision for sustainable development of the telecommunication/ICT sector.⁹ Through this agenda, technological advances contribute to accelerating attainment of the United Nations Sustainable Development Goals (SDGs) by 2030. [Connect 2030](#) Goal 4 (Innovation), in particular, is to “Enable innovation in telecommunications/ICT in support of the digital transformation of society”. Target 4.1 is that by 2023 all countries should have policies/strategies fostering telecommunication/ICT-centric innovation.

The main objectives set for BDT by WTDC, include (a) to strengthen the ITU-D membership’s capacity to integrate ICT innovation in their national development agendas, and (b) to promote a culture of innovation. This mandate was further developed at WTDC-17 with an additional expected outcome of developing “strategies to promote innovation initiatives, including through public, private and public-private partnerships”.¹⁰ Relevant regional initiatives were also adopted for each region.¹¹

⁹ ITU. [Connect 2030 - An agenda to connect all to a better world.](#)

¹⁰ ITU. WTDC. [Final report of WTDC-17](#), p. 45. ITU, 2018.

¹¹ ITU. [ITU-D regional initiatives 2018-2021.](#)

2 ICT-centric innovation policy in the Arab States

2.1 Regional context

In terms of ITU membership, the Arab States region comprises the following 21 countries: Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Qatar, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates and Yemen. The region is also classified into other clusters. The Middle East and North Africa (MENA) region is a big cluster grouping together 19 out of the 22 Arab League member countries (i.e. the 21 countries listed above plus the State of Palestine)^{12*}. The Gulf Cooperation Council (GCC) is another cluster to which some countries belong.¹³

In most cases, and for ease of analysis, the countries of the Arab League are divided into several clusters given the wide variations in their socio-economic and political situations. We will use the classification of O'Sullivan et al. (2011):¹⁴

1. *Resource-rich, labour-abundant*: The countries in this cluster are producers and exporters of oil and gas. They also have their own large native populations. This group of countries includes Algeria, Iraq, Syrian Arab Republic and Yemen.
2. *Resource-rich, labour-importing*: The countries in this cluster are producers and exporters of oil and gas. They have large numbers of foreign or expatriate residents, who represent a significant percentage of the total population; in some cases, expatriates even constitute the majority. This group of countries include the Gulf Cooperation Council (GCC) members (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates) and Libya.
3. *Resource-poor*: The countries in this cluster are small producers or importers of oil and gas, and include Djibouti, Egypt, Jordan, Lebanon, Mauritania, Morocco, Tunisia and the State of Palestine. For the purposes of this report, Sudan, Somalia and Comoros have also been added in this category.

There are large inequalities within the countries, too. The gap between higher-income and lower-income groups is large. Although the poverty rate is falling, the number of poor people has not decreased for many years on account of rates of increase in population.

2.2 Impact of COVID-19

A few months ago, it would have been impossible to foresee the rapid changes that have taken place due to the COVID-19 pandemic. Governments around the world, and in Arab countries in particular, have taken drastic measures, such as stay-at-home orders, to contain the virus and control its spread. While this was a great challenge, which affected the socio-economic lives of millions of people around the globe, it also constituted an opportunity, particularly for ICTs, leading to an enormous surge in digitalization and digital transformation. Within a matter

¹² **Note*: The status of Palestine in ITU is governed by Resolution 99 (Rev. Dubai, 2018) of the ITU Plenipotentiary Conference.

¹³ Munira Aminova et al. (2020). [Entrepreneurship Ecosystem in the Arab World: The status quo, impediments and the ways forward](#). *International Journal of Business Ethics and Governance (IJBEG)*, 3(3), pp. 1-13. §2

¹⁴ Anthony O'Sullivan et al. (2011). [Opportunities and Challenges in the MENA Region](#), p. 2, Box 1.

of weeks, citizens moved to home offices (reducing face-to-face contact) and children started home schooling, while businesses and entrepreneurs had to innovate on a global scale to survive and adapt to the new realities. As a crisis like this can create and push innovations, the digital transformation was moved forward on an unprecedented scale.

Microsoft Teams, Zoom and other technologies topped the charts, and the daily time spent on mobile apps increased drastically.¹⁵ These major changes and urgent needs prompted governments to respond rapidly and come up with the solutions to enable home schooling and home office work. Oman, for instance, moved to lift restrictions on Zoom, Microsoft Office and Google Meet.¹⁶ Qatar lifted restrictions on Microsoft Teams and Webex.¹⁷ Other countries such as the United Arab Emirates temporarily lifted the restrictions on Zoom and Microsoft Teams to enable remote working and remote schooling options.

Despite some of the above measures being temporary, they have created opportunities to shift the delivery of services to different online platforms, enable video conferences, reduce travel and achieve a better work-life balance for many individuals and businesses. Of course, the restrictive nature of new COVID-related policies has raised concerns over freedom of movement of people and individual liberties, but the health and safety of the broader public has been a bigger concern at this stage.

For entrepreneurs and start-ups who had the right ecosystem, this new situation has opened new doors, by further enforcing the ubiquity of innovation and its global reach. Using technology, entrepreneurs have been able to reach larger audiences without being restricted to the geographic boundaries of traditional marketplaces. Universal technical standards have also enabled lower market entry costs. For customers, transaction costs for accessing goods and services are further reduced; and consumers can cross-compare prices worldwide more easily and search and find goods and services from the comfort of their home, 24/7.

Nevertheless, the pandemic has further deepened the digital divide between and within the countries. The divide is visible on multiple fault lines. First, between those who have access to technology, infrastructure and enabling laws, and those who do not. It is also evident between those who live in an environment where entrepreneurship and innovation ecosystems are conducive to and supportive of entrepreneurs and small and medium enterprises (SMEs), and those who live in environments where red tape, bureaucracy and other hurdles prevent entrepreneurs from taking initiatives and exploring benefits stemming from the accelerated digital transformation brought about by COVID-19.

The pandemic has also had socio-economic implications. Prolonged confinement has had a negative effect on employment. Arab youth unemployment is the highest in the world, and the fastest growing.¹⁸ Millions of people in the Arab States region are at the risk of falling deeper into poverty. No less than 85 per cent of young working-age Arabs are employed in the informal sector.

During the COVID-19 lockdown, 100 million students were out of school, lacking either the technology at home or the training to switch to online schooling. Aside from GCC countries,

¹⁵ App Annie. [The Impact of Coronavirus on the Mobile Economy. Blog post by Lexi Sydow, 17 March 2020](#)

¹⁶ Sylvia Westall. [Oman Lifts Curbs on Some Internet Call Apps to Counter Virus. Bloomberg](#), Technology, 17 March 2020.

¹⁷ Lisa Barrington. [In coronavirus lockdown, Gulf residents urge end to voice-call bans. Reuters](#), 23 March 2020.

¹⁸ United Nations Economic Commission for Western Asia (ESCWA). [Impact of COVID-19 on young people in the Arab region](#). E/ESCWA/2020/Policy Brief.9.

only 51.6 per cent of households in the rest of the Arab States have Internet access;¹⁹ thus, connectivity remains an issue. To deal with the anticipated negative economic and social implications for people and businesses, several Arab countries (e.g. United Arab Emirates, Qatar, Egypt and Saudi Arabia) have already put in place mitigation measures.²⁰

2.3 Arab States policy monitor - Three engines of growth

This report will depict the current state of the Arab countries' innovation ecosystem in terms of three engines of growth: the *innovation ecosystem*, the *entrepreneurial ecosystem* and the *technology ecosystem*.

The international benchmarks that cover these three areas are: (a) the *ICT Development Index (IDI)*, published by ITU;²¹ (b) the *Global Innovation Index (GII)*, co-published annually by Cornell University, INSEAD and the World Intellectual Property Organization (WIPO);²² and (c) the *Global Entrepreneurship Index (GEI)* published annually by the Global Entrepreneurship Development Institute (GEDI).²³

Table 1 below shows country rankings on these indices as a proxy for the engines of growth. The innovation ecosystem is represented by the *GII*, the entrepreneurial ecosystem is represented by the *GEI*, and the technology ecosystem is represented by the *IDI*.

The table additionally shows the rankings on the *Global Competitiveness Index (GCI)* published by the World Economic Forum (WEF).²⁴

Table 1: Three engines of growth

Economy	IDI ranking 2017	GII ranking (2020)	GEI ranking (2019)	GCI ranking (2019)
Algeria	102/176	121/129	88/137	89/141
Bahrain	31/176	79/129	38/137	45/141
Comoros	164/176	n/a	n/a	n/a
Djibouti	158/176	n/a	n/a	n/a
Egypt	103/176	96/129	81/137	93/141
Iraq	n/a	n/a	n/a	n/a
Jordan	70/176	81/129	63/137	70/141
Kuwait	71/176	78/129	47/137	46/141
Lebanon	64/176	87/129	66/137	88/141

¹⁹ Ibid.

²⁰ United Nations Development Programme (UNDP). Arab States. [Arab countries respond to COVID-19: Heightening preparedness; Integrated multi-sectoral responses; Planning for rapid recovery.](#)

²¹ ITU. [The ICT Development Index \(IDI\).](#)

²² Global Innovation Index. [Global Innovation Index \(GII\).](#)

²³ Global Entrepreneurship Development Institute (GEDI). Research. [Global Entrepreneurship Index \(GEI\).](#)

²⁴ WEF. Global Competitiveness Index. [Global Competitiveness Report 2019](#) and [Global Competitiveness Index 2017-2018 edition.](#)

²⁵ Zoltán Ács et al. GEDI. [Global Entrepreneurship Index \(GEI\) 2019.](#)

Table 1: Three engines of growth (continued)

Economy	IDI ranking 2017	GII ranking (2020)	GEI ranking (2019)	GCI ranking (2019)
Libya	n/a	n/a	114/137	n/a
Mauritania	151/176	n/a	134/137	134/141
Morocco	100/176	75/129	68/137	75/141
Oman	62/176	84/129	39/137	53/141
State of Palestine	123/176	n/a	n/a	n/a
Qatar	39/176	70/129	28/137	29/141
Saudi Arabia	54/176	66/129	42/137	36/141
Somalia	n/a	n/a	n/a	n/a
Sudan	145/176	n/a	n/a	n/a
Syrian Arab Republic	126/176	n/a	n/a	n/a
Tunisia	99/176	65/129	53/137	87/141
United Arab Emirates	40/176	34/129	25/137	25/141
Yemen	159/176	131/129	n/a	140/141

The rankings in the table above indicate the performance of Arab countries on the three engines of growth. Countries in the Gulf region (e.g. Bahrain, Qatar, United Arab Emirates) have better-performing engines of growth than other Arab-dominated areas like North Africa. Countries such as Sudan, Yemen or Mauritania occupy lower positions in the rankings, and thus would most likely have fragile ICT-centric innovation ecosystems.

These observations are to be taken with caution. Since our analysis is based on secondary data provided by ITU, GII and the Global Entrepreneurship Monitor (GEM), it is worth noting that the results from each country are dependent on the availability of data for their indicators. A potential limitation is the availability of institutional data in certain countries. In several cases, the data analysts had to omit countries, such as the State of Palestine, Somalia, Sudan, Yemen or the Syrian Arab Republic, because of a lack of proper institutional variables. For instance, for the technological dimension of innovation, data available for each of the 21 ITU Member States in the Arab region plus the State of Palestine are based on the information stemming from the ITU IDI shown in Table 2 below, where only two indicators are completed for some of the target countries.

Table 2: Technological dimension of innovation - Availability of data

<i>Economy</i>	<i>Sufficient data availability</i>	<i>1.1 Household computer</i>	<i>1.2 Household Internet</i>	<i>1.3 Bandwidth</i>	<i>1.4 Network coverage</i>	<i>1.5 Fixed broadband</i>	<i>2.1 Internet users</i>	<i>2.2 Mobile broadband</i>	<i>2.3 Mobile traffic</i>
<i>Algeria</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Bahrain</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Comoros</i>					✓	✓		✓	
<i>Djibouti</i>	✓	✓	✓	✓	✓	✓	✓	✓	
<i>Egypt</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Iraq</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Jordan</i>	✓				✓	✓		✓	✓
<i>Kuwait</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Lebanon</i>	✓				✓	✓		✓	✓
<i>Libya</i>					✓			✓	
<i>Mauritania</i>					✓			✓	
<i>Morocco</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Oman</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>State of Palestine</i>	✓	✓	✓	✓	✓	✓	✓	✓	
<i>Qatar</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Saudi Arabia</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Somalia</i>					✓			✓	
<i>Sudan</i>					✓	✓		✓	
<i>Syrian Arab Republic</i>					✓	✓		✓	
<i>Tunisia</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>United Arab Emirates</i>	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Yemen</i>					✓			✓	

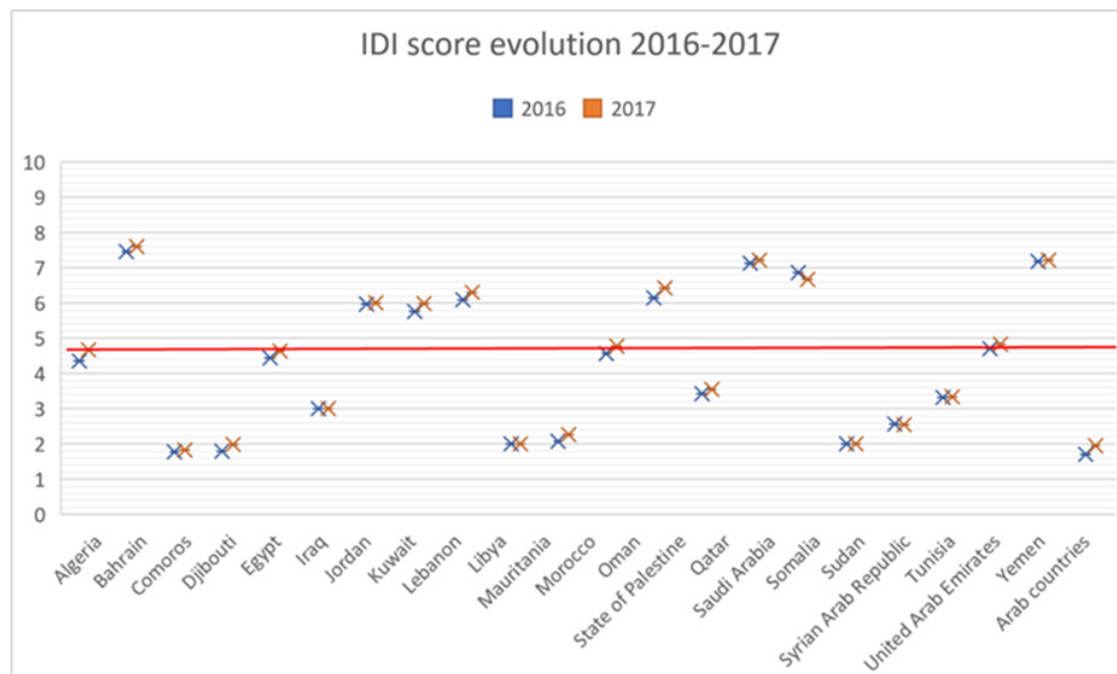
Source: ITU-IDI 2020²⁶

Although rankings may be considered important for country profiles, another perspective from which the degree of development of each country can be viewed is the evolving score obtained on these global indicators. In the movement towards a fourth industrial revolution, ICT operators and infrastructures are important because they influence the emergence of digital opportunities and the formation of new entrepreneurs. Without intellectual property rights, individuals may not have the incentive to invest in physical or human capital or adopt more efficient technologies. When telecom markets are highly restricted and governments send the wrong signals, there is little substitution between labour and capital, and technological change would tend to be constrained. Nevertheless, from the IDI scores and their progression between 2016 and 2017

²⁶ ITU. Background document. [ICT Development Index 2020: A proposal](#). 8th meeting of the Expert Group on Telecommunication/ICT Indicators (EGTI) and 11th meeting of the Expert Group on Household Indicators (EGH), 14-18 September 2020. Annex, pp. 16-19.

- the last available data - shown in Figure 1, we perceive a positive trend in all Arab States except, perhaps surprisingly, Saudi Arabia, which declined from 6.89 to 6.69 points, while still however performing better than the average for Arab countries (red line on the graph).

Figure 1: IDI score evolution 2016–2017



--- - Average score for Arab countries (i.e. 4.84 - IDI, 2017)²⁷

ITU has developed a colour-coding system using the following parameters:

- *Green* indicates strong performance and presence of good practices. The threshold was set at countries in the top quartile (the top 25 per cent) based on the overall index ranking.
- *Yellow* indicates insufficient performance but presence of some good practices. The threshold was set at countries within the middle quartiles (between 26 and 75 per cent).
- *Red* indicates poor performance with absence of very few good practices. The threshold was set at countries falling within the lowest quartile (the bottom 25 per cent).

Each index's rankings are calculated to provide a snapshot assessment of the engines, as follows:

ITU ICT Development Index: Countries ranked between 1 and 44 have a strong performance (green); 45-132 indicates insufficient performance (yellow); and 133-176 indicates poor performance (red).

Global Innovation Index: Countries ranked between 1 and 32 have a strong performance (green); 33-96 indicates insufficient performance (yellow); and 97-129 indicates poor performance (red).

Global Entrepreneurship Index: Countries ranked between 1 and 34 have a strong performance (green); 35-102 indicates insufficient performance (yellow); and 103-137 indicates poor performance (red).

²⁷ ITU. Statistical reports. [ICT Development Index 2017](#). Geneva, 2017.











Global Competitiveness Index: Countries ranked between 1 and 35 have a strong performance (green); 36-105 indicates insufficient performance (yellow); and 106-141 indicates poor performance (red).

These indices serve as a proxy for the engines of growth. The entrepreneurial ecosystem is represented by the GEI, the technology ecosystem is represented by the ITU IDI and the innovation ecosystem is represented by the GII. Using the data presented above and the colour-coding scheme, the performance monitor for the three engines of growth is thus presented in Table 3 below.

Table 3: Arab States policy monitor - ICT-Centric Innovation Performance monitor

Economy	Income level (GII 2019)	Entrepreneurial ecosystem performance (GEI 2019)	Technology ecosystem performance (IDI 2017)	Innovation ecosystem performance (GII 2020)
Algeria	Upper-middle income			
Bahrain	High income			
Comoros	-	-		-
Djibouti	-	-		-
Egypt	Lower-middle income			
Iraq	-	-	-	-
Jordan	Upper-middle income			
Kuwait	High income			
Lebanon	Upper-middle income			
Libya	-		-	-
Mauritania	-			-
Morocco	Lower-middle income			
Oman	High income			
State of Palestine	-	-		-
Qatar	High income			
Saudi Arabia	High income			
Somalia	-	-	-	-

Table 3: Arab States policy monitor - ICT-Centric Innovation Performance monitor (continued)

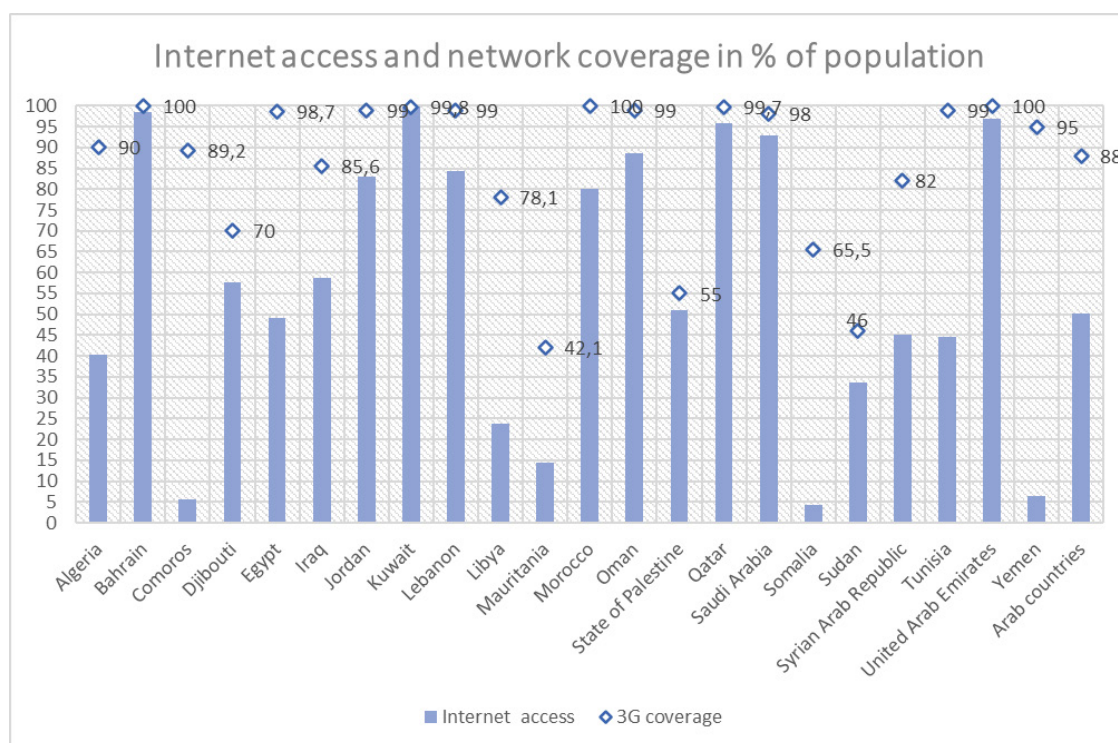
Economy	Income level (GII 2019)	Entrepreneurial ecosystem performance (GEI 2019)	Technology ecosystem performance (IDI 2017)	Innovation ecosystem performance (GII 2020)
Sudan	-	-		-
Syrian Arab Republic	-	-		-
Tunisia	Lower-middle income			
United Arab Emirates	High income			
Yemen	Low income	-		

The positioning of the Arab countries for which data were available still demonstrates three levels of performance. In the upper bracket, we can identify most of the Gulf countries, with some good practices. Countries in the MENA region would be situated in the middle bracket, and the poorest countries in terms of GDP are underperforming. Thus, we cannot talk about one model or path to take the Arab States region's ICT-centric innovation to its full potential, but three.

A further means of gauging the potential for growth in the IT sector, and thus for ICT-centric innovation, is coverage of the population by networks and use of Internet by households. In this respect, one observation made by ITU in its latest measurement of digital development for 2020 points to a wide urban-rural connectivity gap. In some countries, there are still large swathes of rural areas that are not yet covered by a mobile-broadband network, and fewer households in these areas have Internet access. This is visible in Figure 2 below in the cases of Mauritania, Sudan or Somalia, for example.

Figure 2 also illustrates the full or nearly full broadband coverage of the population and access to Internet by the population in countries such as Bahrain, Kuwait, Qatar, United Arab Emirates and Saudi Arabia, and the differences with other Arab countries analysed. A dashed line has been plotted to show the average level of penetration within the region as a whole. In countries like Morocco, Algeria, Egypt or Tunisia, where connectivity is widely available and affordable, young people are enthusiastic adopters. This follows a global trend whereby 70 per cent of young people aged 15 to 24 have access to Internet compared to 50 per cent of the population as a whole. A more problematic context for ICT-centric innovation is found in countries marked with red arrows: without coordinated and comprehensive intervention for this third tier, there are countries, especially those in conflict areas such as Somalia, Libya or Yemen, that are at risk of becoming late adopters of disruptive technologies, further widening the digital innovation divide.

Figure 2: Internet access and network coverage as a percentage of population



Gap in access to Internet and network coverage.²⁸

2.4 Review of ICT-centric policies and strategies

This section provides a non-exhaustive summary list of main policies, rules and regulations related to innovation, entrepreneurship and technology in the ITU Arab States region, which includes 21 Member States plus the State of Palestine. As can be seen from Table 4 covering different States, some countries have policies that create a very favourable environment for growth and development of all three ecosystems, while in others there is a lot more scope for further improvement.

²⁸ Based on data from ITU's Measuring the Information Society Report 2018 - Volume 2, Op. cit.

Table 4: ICT-centric innovation ecosystem strategies and policies in the Arab States region

Policy	Policy type			Reference
	Entrepreneurial	Technology	Innovation	
Algeria				
<i>Law No. 17-02: State Support for Small and Medium Entrepreneurship</i> (adopted 10 January 2017)	x			<i>Journal Officiel</i> 11 January 2017 [in French]
<i>Law No. 16-09: Revised Investment Law</i> (implemented in 2017)	x		x	Oxford Business Group
<i>Law No. 2000-03: ICT Regulations: General Rules on post and telecommunication</i> (implemented in August 2000)	x	x	x	<i>Journal Officiel</i> 6 August 2000 [in French]
<i>Law No. 18-5: Electronic commerce regulations</i> (ratified in May 2018)	x	x	x	<i>Journal Officiel</i> 16 May 2017 [in French]
<i>Law No. 18-07: Protection of natural persons in regard to the processing of personal data</i> (implemented in June 2018)	x	x	x	One Trust Data Guidance
<i>Establishment in 2000 of the Regulatory Authority for Posts and Telecommunications (ARPT)</i> , regulating postal services and the telecommunication sector		x		GISWatch Country report Algeria
Bahrain				
<i>Bahrain Vision 2030</i>		x	x	Economic Vision 2020 for Bahrain
<i>Bahrain Economic Development Board (EDB): Innovation Hub project</i>	x	x	x	Mubasher Bahrain EDB
<i>Legislative Decree No. 48 of 2002 promulgating the telecommunications law</i>	x	x	x	Bahrain Telecoms Law
<i>E-government Act of 2022: Creation of an e-government authority</i>	x	x	x	Bahrain Information and E-government Authority
<i>Law No. 30 issuing a Law on Protection of personal data</i> (entered into force in August 2019)		x		Bahrain Legislation & Legal Opinion Commission [in Arabic]

Table 4: ICT-centric innovation ecosystem strategies and policies in the Arab States region (continued)

Policy	Policy type			Reference
	Entrepreneurial	Technology	Innovation	
<i>Law No. 22 of 2018: Revised Bankruptcy Law</i> (came into effect in December 2018)	×		×	EDB Bahrain
Comoros				
<i>2014 Communications Act: Liberalizing Comoros' telecommunication market</i>	×	×	×	World Bank
<i>Decree No. 065 of 2009: ICT sector policy</i>	×	×	×	ITU Country profile - Comoros
<i>Law No. 95-09/AF, Decree No. 95-106: Creation of INRAPE²⁹ as a public scientific and technical institute</i>		×	×	UN InforMEA
Djibouti				
<i>Vision Djibouti 2035</i> (promoting ICT)	×	×	×	European Commission
<i>Strategy for Accelerated Growth and Job Promotion (SCAPE)</i> (adopted in 2014)	×		×	Ministry of Economy and finance [in French]
<i>Law N0. 50/AN/09/6 L on protection of industrial property</i>	×	×	×	Presidency of the Republic
<i>Science and Technology Research Partnership for Sustainable Development: Establishing efficient use and sustainable management of water resource</i>		×	×	JICA Press release
<i>Djibouti Data Centre: Access to all main international and regional cable systems linking European, Middle Eastern, Asian, and African markets; and future Obock Data Centre</i>		×	×	NewAfrican
Egypt				
<i>National ICT Strategy 2012-2017: Toward a Digital Society and Knowledge-Based Economy</i>		×	×	Ministry of Communications and IT

²⁹ National Institute for Research in Agriculture, Fisheries and the Environment (INRAPE)

Table 4: ICT-centric innovation ecosystem strategies and policies in the Arab States region (continued)

Policy	Policy type			Reference
	Entrepreneurial	Technology	Innovation	
<i>Investment Law No. 072 of 2017</i> : Offering incentives and reducing bureaucracy for FDI to help companies	x			Embassy of Egypt in the US
<i>Technology Innovation and Entrepreneurship Centre (TIEC)</i> (founded in 2010) – government entity to develop ICT sector, online innovation hub to connect innovators and entrepreneurs	x	x	x	TIEC
<i>E-commerce Strategy for Egypt - 2018</i>	x	x	x	UNCTAD
<i>New Bankruptcy Law No. 11</i> (issued in 2018): Encourage innovation and entrepreneurship by providing a safer environment and worrying less about risk-taking.	x		x	Mondaq
<i>Digital Egypt</i>	x			Ministry of Communications and IT
<i>Egypt's ICT 2030 Strategy</i>		x	x	Ministry of Communications and IT
Iraq				
<i>Coalition Provisional Authority Order No. 81</i> on patent, industrial design, undisclosed information, integrated circuits and plant variety law (2004)	x	x	x	CPA/ORD/26
'1 Trillion Dinars initiative': Supporting SMEs by making available several types of loans	x		x	Government of Iraq
<i>Iraq vision 2030</i> : Digitalization, achieving self-sufficiency, moving from rent to production, supporting SME	x	x	x	Iraqi Economic Centre (IEC)
<i>E-signature Law of Iraq No. 078 of 2012</i> : Electronic transactions and signature	x	x	x	Inter-regional Standardization Forum
Jordan				
<i>E-commerce Law No. 85</i> , repealed by <i>Electronic Transaction Law No. 15</i> issued in 2015	x	x	x	Official Journal 15 April 2015 [in Arabic]

Table 4: ICT-centric innovation ecosystem strategies and policies in the Arab States region (continued)

Policy	Policy type			Reference
	Entrepreneurial	Technology	Innovation	
<i>Law No. 71 (2001): Patents of Invention</i>	×	×	×	Patents Regulations Official Gazette
<i>REACH 2025: Jordan's Digital Economy Action Plan - Investing in digital transformation</i>	×	×	×	REACH2025
<i>Law No. 16 of 2016: Investment Fund Law, to establish a fund that has the right to own, develop and operate specific projects such as the railway network, the electric connectivity system, etc.</i>		×	×	UNCTAD Investment Policy Hub
<i>R&D Tax Law: 1% of net profits of all public limited companies invested in R&D</i>		×	×	Erawatch Country report 2010
Kuwait				
<i>Kuwait MoE's '1 to 1' initiative to promote integration of technology with education</i>		×	×	MENA Herald 28 May 2017
<i>'New Kuwait' Vision 2035: ICT development/developing into innovation hub</i>	×	×	×	New Kuwait Summit 2019
<i>Economic package for SMEs and individuals affected by COVID-19 (loans at very low interest)</i>	×			KPMG Insights
<i>Law No. 98 (implemented in 2013), now amended as Law No.14 (since 2018): Kuwait National Fund for SME Development</i>	×		×	National Fund for SME Development
<i>Strategic Plan (2017-2021): Raising government expenditure for scientific research from 0.3% to 1% of GDP and accelerating establishment of a 'National Research Council'</i>		×	×	Kuwait Foundation for the Advancement of Sciences (KFAS)
Lebanon				
<i>Lebanon SME Strategy (2015): A roadmap to 2020</i>	×			Ministry of Economy and Trade

Table 4: ICT-centric innovation ecosystem strategies and policies in the Arab States region (continued)

Policy	Policy type			Reference
	Entrepreneurial	Technology	Innovation	
<i>Law No. 431/2002 - Lebanon Telecommunications Law: Sets out the general legal framework for telecommunications in Lebanon. It contains a detailed institutional framework, including the creation of the telecommunication regulatory authority.</i>		x		Lebanon Telecom. Regulatory Authority (TRA)
<i>Science, Technology and Innovation Policy (STIP) for Lebanon (2006)</i>		x	x	National Council for Scientific Research
Libya				
<i>E-Libya initiative adopted by the General Authority for Communications and Informatics (GACI)</i>		x	x	GACI [in Arabic]
Mauritania				
<i>National Strategy for Modernization of the Administration and ICTs 2012-2016</i>		x	x	Mauritania - relevant ministries [in French]
Morocco				
<i>National strategy - Digital Morocco 2020: Seeks to reinforce Morocco's position as a regional digital hub and enhance its digital skills and governance. The Agence de développement du digital (ADD) (Digital Development Agency) is the main catalyser of the Digital Morocco transformation.</i>		x	x	ADD Morocco
<i>Innovation Morocco: Initiative aiming to position the country among the economies which are creators and not just consumers of technologies</i>		x	x	C.R.I. Casablanca-Settat [in French]
<i>Law No. 114-13 on the Status of 'auto-entrepreneur' The law was promulgated to combat entrepreneurship in the informal sector. It confers number of fiscal and judicial advantages to encourage entrepreneurs to register their business officially.</i>	x			Official Journal No. 6344 (19 March 2015) [in French]

Table 4: ICT-centric innovation ecosystem strategies and policies in the Arab States region (continued)

Policy	Policy type			Reference
	Entrepreneurial	Technology	Innovation	
<i>Law No. 53-05 on Electronic exchange of legal information.</i> This law is the main law promoting e-commerce in Morocco.	x	x	x	Official Journal No. 5584 (6 December 2007) [in French]
Oman				
<i>Digital Oman 2030:</i> The e.Oman 2030 strategy aims at building a strong foundation to benefit from the digitalization and technology changes driven by the 4th Industrial Revolution.		x	x	Omanuna
<i>Government Innovation Initiative:</i> An initiative run by the ministry in charge of technology and communications that targets government entities and aims to encourage creative thinking and innovation in the governmental sector.			x	Ministry of Transport, Communications and IT
<i>Electronic Transactions Law:</i> This is the first law legalizing electronic transactions in Oman, which can be defined as any contract, agreement or communication in this regard to be fully or partially executed by electronic means such as electronic messages.	x	x		Information Technology Authority (ITA)
<i>Smart-cities programme:</i> This programme is both a medium and an outcome of state-of-the-art smart solutions, involving a web of sensors, real-time data, ICT integration, and coordination between public and private institutions to provide efficient and effective services to citizens.		x	x	Smart City Platform
State of Palestine				
<i>Palestinian Information Technology Association of Companies (PITA):</i> Aims to lead the Palestinian ICT sector towards an innovation-based economy.		x	x	PITA

Table 4: ICT-centric innovation ecosystem strategies and policies in the Arab States region (continued)

Policy	Policy type			Reference
	Entrepreneurial	Technology	Innovation	
<i>Higher Council for Innovation and Excellence (HICE):</i> Seeks to play a leading role towards consolidating a culture of innovation and excellence among the Palestinian community.	×		×	HICE
Qatar				
<i>Qatar National Vision 2030:</i> Aims to transform Qatar into an advanced country by 2030, capable of sustaining its own development and providing a high standard of living for its population and future generations.	×		×	General Secretariat For Development Planning
<i>Qatar Research, Development and Innovation (QRDI) strategy 2030</i>	×		×	QRDI Council
<i>Qatar Digital Government 2020 strategy</i>		×		Hukoomi
<i>Qatar's National ICT plan 2015</i>		×		ICTQatar
<i>Qatar e-Government 2026</i>	×	×		Hukoomi
<i>Qatar E-Commerce Law:</i> This law includes provisions on areas such as e-signatures, e-documents and authentication. It covers e-commerce transactions in Qatar, including e-government services	×	×	×	ICTQatar
Saudi Arabia				
The Kingdom has an all-encompassing digital transformation process within the <i>Kingdom of Saudi Arabia's Vision 2030</i> . Its main components are digital health, digital education, e-commerce and smart cities. The <i>NEOM project</i> is another comprehensive project which contributes to the achievement of Vision 2030.		×	×	Vision Saudi Arabia NEOM
<i>Saudi Arabia ICT Sector strategy:</i> Focused on empowering digital Saudi. The strategy themes are broken down into 13 strategic priorities.		×	×	Ministry of Communications and IT

Table 4: ICT-centric innovation ecosystem strategies and policies in the Arab States region (continued)

Policy	Policy type			Reference
	Entrepreneurial	Technology	Innovation	
<i>Digital Economy Policy</i> in which the Kingdom strives to enable SMEs and entrepreneurs in the digital fields by removing obstacles and creating opportunities in addition to facilitating access to funding and formulating incentives, regulations and legislation in favour of these enterprises.	×	×	×	National Digital Transformation Unit (NDU)
Implementation of regulations of the <i>E-Commerce Law</i> with immediate effect on 31 January 2020				Middle East Insights ³⁰
Somalia				
<i>Somalia Information and Communication Technology Policy and Strategy 2019-2024</i>		×	×	Ministry of Post, Telecoms and Technology
<i>Somalia National Development Plan 2020-2024</i>			×	Ministry of Planning, Investment and Economic Development
Tunisia				
The <i>Start-up Act</i> , which is part of the wider strategy called <i>Digital Tunisia 2020</i> , promoted by the Tunisian Government: Identifies a legal framework that includes 20 measures in favour of investors and start-ups.	×	×	×	INSME
<i>National Strategic Plan - Digital Tunisia 2020</i>	×	×	×	Ministry of Communication Technology and Digital Economy

³⁰ The law is new and the full text is not available as yet, but references to it can be found on many websites.

Table 4: ICT-centric innovation ecosystem strategies and policies in the Arab States region (continued)

Policy	Policy type			Reference
	Entrepreneurial	Technology	Innovation	
The Tunisian Ministry of Industry and SMEs, in collaboration with the EU-funded <i>Innov'i</i> project, has launched a series of webinars with the aim of deepening reflection on the need to re-focus the country's economic growth model on innovation and technology. <i>Innov'i - EU4Innovation</i> is a five-year programme that aims at strengthening the ecosystem of entrepreneurship and innovation in Tunisia. It is funded by the EU and implemented by Expertise France.	x	x	x	EU Neighbours south
United Arab Emirates				
The <i>National Innovation Strategy</i> (NIS), launched by HH Sheikh Mohammed bin Rashid Al Maktoum, United Arab Emirates Vice-President, Prime Minister and Ruler of Dubai, is considered the main umbrella of the Science, Technology and Innovation policy.		x	x	UAE Government
<i>Smart Dubai</i> : Blockchain, artificial intelligence, data science.	x	x	x	Smart Dubai
<i>Future Dubai</i> : Hub for emerging technologies, accelerators, labs, research.	x	x	x	Dubai Future Foundation
<i>Vision 2021</i> aims to position the United Arab Emirates among the best countries in the world by the Golden Jubilee of the Union. In order to translate the Vision into reality, its pillars have been mapped onto six national priorities, which represent the key focus sectors of government action in the coming years.	x	x	x	Vision 2021
<i>Science, Technology and Innovation (STI) Policy</i> : In November 2015, HH Sheikh Khalifa bin Zayed Al Nahyan announced the adoption of the Emirates higher STI Policy, which includes 100 national initiatives.	x	x	x	United Arab Emirates Government
Yemen				
<i>Yemen's Strategic Vision 2025</i>	x	x	x	FAOLEX

Table 4: ICT-centric innovation ecosystem strategies and policies in the Arab States region (continued)

Policy	Policy type			Reference
	Entrepreneurial	Technology	Innovation	
<i>National Strategy for Women's Development</i>	x			UN Women
E-commerce enabling law: <i>Law No. 40 of 2006</i> relating to Electronic payment systems	x	x	x	Cyrilla [in Arabic]
Republican Decree on Law No. 38 of 1991 relating to Wired and Wireless Telecommunications		x		WTO

For countries such as the Syrian Arab Republic and Sudan, very little information was available on policies, laws and regulations published in the official governmental websites.

2.5 Arab States policy monitor - Enablers of digital transformation

This section provides an overview of the current state of seven enablers of digital transformation for the Arab States region. The enablers are: (a) vision and strategy, (b) infrastructure and programmes, (c) talent and champions, (d) capital and resources, (e) markets and networks, (f) culture and communities, and (g) regulation and policy.

Because each enabler is one component part of a whole, and since every enabler is crucial for successful innovation activities, the combined efficiency of the enablers can be taken together to give a sense of the overall efficiency of the ecosystem. For countries interested in this deeper level of insight, qualitative interviews can be conducted to develop a colour-coded table of the enablers, similar to the previous monitor.

2.5.1 Vision and strategy

Most of the countries of the region have adequate policies and regulatory frameworks to enable digital transformation in their countries. COVID-19 has further driven the quicker adoption of policies enabling digital transformation as well as the lifting of regulations that were hindering it. Examples of such policies include:

- **Smart Dubai.** [Smart Dubai](#) is a comprehensive set of measures to leverage emerging technologies such as blockchain, artificial intelligence (AI) and data science to create personalized, efficient and impactful services. The overall aim of the initiative is to contribute to the vision of making Dubai the happiest city on earth.
- **Dubai Future Foundation.** Like Smart Dubai, [Dubai Future Foundation](#) is working towards positioning Dubai as a leading city of the future.
- **NEOM.** Saudi Arabia's [NEOM project](#) – a pioneering community of dreamers and doers – announced the construction of the first carbon-zero city at Neom. It is a visionary dream of creating a city of the future emerging from the Saudi Vision 2030. This project is billed as humanity's next chapter, with flying taxis, artificial moon and rain and other latest science and technology innovations. In quite a few of the countries of the region, the governments

are investing heavily in innovation and the 'experience economy' to secure a future for when the oil reserves become depleted or the world moves to other sources of energy.

This is by far not an exhaustive list of all visionary, transformational policies and projects in the Arab States region. There are many other exemplary and futuristic innovative technological initiatives. Most of the countries of the region strive to become knowledge economies and to not merely consume the results of technological advancements/innovations but also be drivers and creators of those innovations themselves.

When it comes to setting the vision and the strategy in war-torn or underdeveloped countries, however, this is only being achieved with the help of the United Nations or, in some instances, the EU.

2.5.2 Infrastructure and programmes

This enabler focuses on both hard infrastructure – mobile-network coverage, international Internet bandwidth, secure Internet servers and electricity production – and soft infrastructure.

Gathering comparable data for infrastructure indicators for the 21 ITU Member States in the Arab region plus the State of Palestine remains a challenge. As can be seen below, data are available for 15 of these countries. In other words, comparable data could not be found for seven countries.

- **Hard infrastructure**

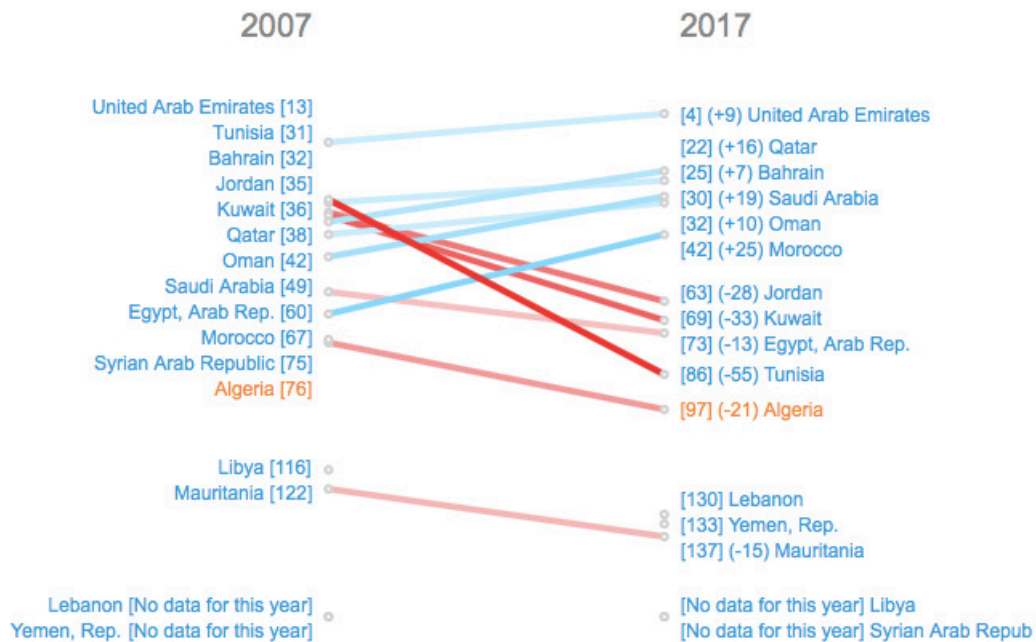
Quality, affordability and availability of overall infrastructure

The Global Competitiveness Index (GCI)³¹ assesses the general state of infrastructure (e.g. transport, communications and energy) in 151 countries of the world (where a score of 1 = extremely underdeveloped – among the worst in the world, and 7 = extensive and efficient – among the best in the world).

In Figure 3, the blue lines indicate a positive evolution whereas the red lines indicate negative evolution. The countries with the sharper decline are marked with the darker red colours, and those with less steep decline are with lighter red. (While reading the chart note: the lines are only positioned relative to the column to the right. They are not aligned to the column to the left.)

³¹ WB (2018). The Global Competitiveness Index

Figure 3: Evolution of the quality of overall infrastructure in Arab countries

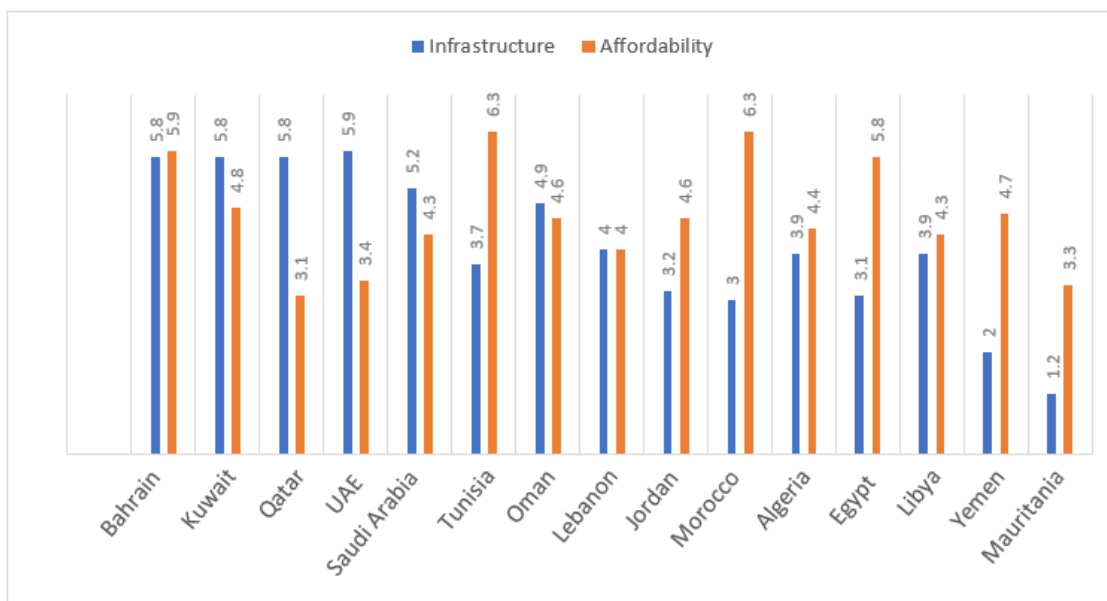


The United Arab Emirates, Qatar and Bahrain top the chart on their general state of infrastructure improvement of GCI, followed by Saudi Arabia, Oman and Morocco. On the other hand, there are sharp downward changes in some countries: Tunisia, for instance, fell 55 places within the last 10 years. In 2007 Tunisia was in the second rank right after the United Arab Emirates, currently in the lower part of the ranking for the region. Kuwait lost 33 places and Algeria 21. Mauritania is in the last row in the region within this ranking, with a further drop of 15 places.

To further assess the affordability and availability of infrastructure, we will use data from ICT Development Index (IDI) as well as from the *Network Readiness Index* (NRI) launched by the World Economic Forum in 2016.³² The NRI will provide this analysis within the framework of the factors to be taken into account to leverage opportunities brought by digital technologies.

³² WEF. Network Readiness Index (NRI). [Benchmarking the Future of the Network Economy](#).

Figure 4: Readiness sub-index



In regard to affordability, we observe that countries such as Tunisia and Morocco stand out clearly as the top countries in the regional affordability ranking. Despite being lower-middle-income countries, they have achieved mobile-broadband prices that are equally or more affordable than those in other Arab States with much higher incomes. Gulf Arab countries have very good infrastructure, but also at rather high prices.³³

Looking at price trends, prices have been reduced in both mobile- and fixed-broadband telephony, with the most significant reductions observed in Kuwait, Yemen and Libya. The highest price reductions in the postpaid, computer-based, mobile-broadband sub-basket were observed in Kuwait, Tunisia and Comoros. In other countries, we can observe a very rapid development of the IT sector, such as in Djibouti.³⁴

In terms of infrastructure, there is a wide gap between the opportunities offered by the Gulf Arab countries (United Arab Emirates, Qatar, Kuwait and Bahrain) and countries in Africa, especially Mauritania and Somalia.³⁵ Communities in those countries living in the neighbourhoods with poor infrastructure are going to be the most affected by the unprecedented changes brought about by COVID-19.

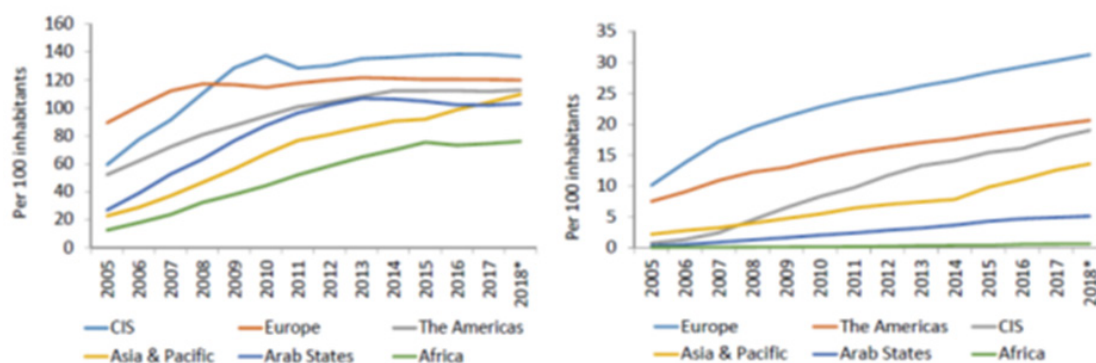
Diffusion of 4G and even 5G is starting to flourish in the Arab region. Challenges in many of the countries analysed persist in terms of lowering high-speed Internet tariffs and providing coverage to remote regions.

³³ Munira Aminova et al. (2020). [Entrepreneurship Ecosystem in the Arab World: The status quo, impediments and the ways forward](#). *International Journal of Business Ethics and Governance (IJBEG)*, 3(3), pp. 1-13. §2

³⁴ Munira Aminova (2019). Entrepreneurship and Innovation Ecosystem in 22 Arab League countries: The status quo, impediments and the ways forward. [ITU publications](#)

³⁵ Ibid.

Figure 5: Mobile-cellular (left) and fixed-broadband (right) subscriptions per 100 inhabitants, by region, 2005-2018 (ITU estimates)



Source: ITU (Aminova, 2018)

As can be seen in Figure 5 above, demand and supply for cellular (left) services have been rising along the world median in Arab countries; whereas demand and supply for fixed broadband (right) has remained low compared to other regions of the world. Access to affordable and accessible networks will drive growth and innovation, a trend further intensified during the COVID-19 pandemic. The impact of COVID-19 and the resulting acceleration of ICT development in terms of the penetration of mobile and cellular networks in the Arab States region will be visible in the coming months.

- **Soft infrastructure**

The soft infrastructure indicator considers the availability of accelerators and incubators, university-industry partnerships, co-working spaces, technoparks, mentors, coaches, technical experts and advisers. These essential networks for entrepreneurs enable them to access the support mechanisms and use the lean method for starting and scaling their businesses. For instance, in the United Arab Emirates young entrepreneurs have access to over 1 770 accelerators, tech-labs, social innovation hubs, local accelerators and support, as well as access to large companies such as IBM, Microsoft, Google and others, further enabling and supporting entrepreneurship growth.

In Tunisia, there is a long list of actors including accelerators, incubators and others. Some examples of foundations and networks are: [Drosos](#), [Kamel Lazaar Foundation](#), [MercyCorps](#), [Yunus Social Business](#), [Hivos](#), [Synergy](#), [Coworking Business Centre](#), [Cogite](#), [Lingare L'Mdina](#), [MEPI](#), [Creativa](#), [Level 1](#) and [Foundation Biat](#). Most of them, unfortunately, are concentrated in the big cities like Tunis. Nevertheless, they do provide adequate support structures.

In Lebanon, there are, for instance: [IDAL - Business Support Unit](#), [Berytech Business Support](#), [Mowgli](#), [Lebanon Business Network](#), [BuBleik](#), [Entrepreneurs Lebanon](#), [Servcorp](#), [Regus](#), [We Initiative](#), [Lebanon Enterprise Development \(LED\) Project](#), [Alfanar](#), [Neopreneur](#), [Agritech Accelerator Program](#), [SpeedLebanon](#), [Berytech](#), [Biat](#), [Endeavor Lebanon](#), [Lebanon Science and Technology Park](#), [Touch Innovation Program](#), [Maria Goepfert-Mayer Incubator \(MGMI\)](#), [AltCity](#) and [Beirut Digital District](#). International organizations also set up support mechanisms to support entrepreneurship and start-ups, e.g. European Bank for Reconstruction and Development (EBRD) [Advice to Small Businesses \(ASB\)](#), European Institute for Cooperation and Development, and others.

This range of support structures enables entrepreneurs and start-ups to access funding for their business ideas, and provides secretarial support, shared office space and access to venture-capital funding, thus supporting social enterprises in Lebanon and other countries. It also includes foundations that empower women entrepreneurs, innovation and start-up hubs, accelerators and incubators, consulting companies, science and technology parks, knowledge hubs and so forth.

Education and training programmes also constitute a significant facet of soft infrastructure. This would include gross enrolment in tertiary education, digital skills, literacy rate and many other factors that would have an impact. As well as university-industry cooperation, indicators would encompass the existence of entrepreneurship programmes at different levels.

Previous studies by ITU³⁶ demonstrate clear differences in the prevailing digital skill levels when comparing individuals with different levels of education across countries. Countries in which a larger portion of the population has benefited from tertiary education also tend to have a population with higher digital skill levels, confirming that digital literacy cannot be viewed separately from traditional literacy at the country level. To put it plainly, individuals with higher levels of education, especially tertiary education or above, are much more likely to have advanced digital skills.

Using mainly online data from UNESCO and the World Bank, we were able to construct Table 5 below, where gross enrolment at tertiary level and literacy rate in adult population can be compared among the 21 ITU Member States in the Arab region plus the State of Palestine.

Table 5: Gross enrolment in tertiary level education and literacy rate in adult population (15–64 years old) (%)

Year	Economy	Total enrolment	Male	Female	Literacy rate %**
2017	Algeria	47.72	38.49	57.31	80.2
2017	Bahrain	45.50	32.35	63.09	95.7
2014	Comoros	8.99	9.91	8.05	78.1 (2015)
2011	Djibouti	4.99	5.94	4.02	49.5 (2012)
2016	Egypt	34.44	34.04	34.85	75.2
2017	Jordan	31.71	29.58	33.87	79.7 (2015)
2013	Kuwait	32.57	22.97	42.66	96.7
2017	Lebanon	38.14	35.25	40.80	96.2
2012*	Libya	30.11	24.07	36.47	93.9
2017	Mauritania	4.84	6.4	3.23	94.4 (2015)
2017	Morocco	33.76	34.23	33.27	52.1
2017	State of Palestine	42.25	32.4	52.49	72.4

³⁶ ITU (2016). *Measuring the information society*. Geneva; ITU (2017). *ICT-centric economic growth, innovation and job creation*. Sharafat, R.A & Lehr, W.H. (Eds). *ITU publications*

Table 5: Gross enrolment in tertiary level education and literacy rate in adult population (15–64 years old) (%) (continued)

Year	Economy	Total enrolment	Male	Female	Literacy rate %**
2016	Iraq	6.11	6.59	5.95	94.8
2016	Oman	44.6	32.77	59.69	96.9
2017	Qatar	16.42	6.59	51.04	97.8
2017	Saudi Arabia	68.94	69.37	68.48	94.7
2016	Somalia	8.99	11.2	7.7	19 (2018)
2015	Sudan	17.00	16.85	17.15	58.6
2016	Syrian Arab Republic	39.18	35.97	42.73	86.3
2017	Tunisia	32.06	23.22	41.18	81.8
2014	United Arab Emirates	22.03	15.35	34.62	93.8
2011	Yemen	9.97	13.74	6.07	69.9 (2015)

Source: UNESCO. [Data for the Sustainable Development Goals](#)

* For Libya, own calculations based on [CIA World Factbook](#) and [ACAPS](#)

** For 2017, except where otherwise indicated in brackets. Data from [World Bank Open Data](#), [IndexMundi](#), [Knoema](#) and UNDP

Concrete and reliable numbers on student enrolment in Iraq and Libya were difficult to obtain. Low literacy rates make the Internet irrelevant to many (e.g. in Somalia or Djibouti). More than a billion people in developing countries cannot read or write. According to a recent the World Bank report³⁷, education is a key tool for increasing the levels of welfare and helping to break the poverty cycle. In 2004 only one in four men and 13 per cent of women in Somalia were literate. Today, albeit still a low level of literacy, 1 of 2 Somalis can read and write, with literacy being more common among younger generations, urban population, and men.

The primary reasons given by many people in developing countries for not using the Internet are a perceived lack of need and a perceived lack of skills. This means there is an opportunity to create a potential virtuous circle, where improved education would improve ICT penetration and improved ICT penetration would improve education.

Education is therefore a crucial requirement for widespread use of digital technologies and the Internet. However, educational training programmes should go beyond merely imparting digital skills. Education needs to inculcate an awareness that ICTs can indeed be used to enhance health, employability and knowledge acquisition, both through the acquisition of information but also through enhanced communication. Furthermore, software programmers need to do much more to make such technologies user-friendly and more intuitive for marginalized groups.

³⁷ WB (2019). Somali Poverty and Vulnerability Assessment

2.5.3 Talent and champions

The Future of Jobs (2020) report³⁸ predicts continued skills gaps and high demand for skills worldwide as in-demand skills across jobs change within the next five years. The top skills that employers will be looking out for are believed to be critical thinking, analysis and problem-solving as well as skills in self-management such as active learning, resilience, stress tolerance and flexibility. On average, companies estimate that around 40 per cent of workers will require reskilling of up to six months and 94 per cent of business leaders report that they expect employees to pick up new skills on the job.

The situation in the Arab region is not even when it comes to talent and champions. Some countries have abundance of talent like Egypt. In Egypt entrepreneurs can draw talent from over 150 universities and institutes producing 500 000 annual graduates³⁹. This gives Egypt the 'Top 10 Affordable Talent' rank according to Genome Report (2020). UAE - Sharjah is home to some of the region's finest higher education institutions, University City attracts, educates, and produces top technical talent⁴⁰, making Sharjah 'Top 30 Affordable Talent' rank according to Genome Report (2020). Bahrain's Labour Fund (Tamkeen) offers wage subsidies to support the employment of Bahraini graduate job seekers in the private sector. The programme also supports salaries of Bahraini private programme employees by subsidizing a percentage of sector employees by an enterprise. This surely stimulates the retention of talents locally.

Overall, the enrolment to tertiary education (% of gross) remains low – at a rate of 32.5 per cent, 2019 in the Arab region; in comparison for instance to the European Union, where the enrolment was at 70 per cent in 2019⁴¹. The worldwide average is 36 per cent. The overall percentage for the Arab countries is a result of the average score between countries like Saudi Arabia with the percentage of tertiary education as high as 68 per cent and countries like Somalia where the tertiary education enrolment is as low as 4 per cent. This, showcases the wide skill and talent disparities in the Arab countries.

Another indicator of talent being patents – Saudi Arabia leads the charts for patent applications, accounting for 1 188 patents in 2019 alone. Egypt follows Saudi Arabia in relation to patent registrations accounting for 1 027 patents in 2019⁴². On the contrary Bahrain only filed for 4 patents in 2019 and Kuwait 1 in 2018 according to WIPO.

When it comes to champions, MENA region's potential remains largely untapped, especially in the area of digital entrepreneurship. Revenue pools are mostly captured by global players rather than local champions. There is, however, some hope as some of the local champions are tapping into the local service market despite the competition from global giants. In addition, this growing young, tech-savvy population of the Arab region is likely to create more demand for such services locally, which will be a further stimulating factor for the growth of such services.

Digital skills among the population of Arab countries

Talent and skills are ultimately the predominant enablers of the competitiveness in the Arab region. The ability to use and take advantage of the opportunities created by digital technologies will enable the innovators to leapfrog the traditional pathway for development. Figure 6 provides

³⁸ WEF (2020). [The Future of Jobs Report 2020](#). WEF, Cologny (Geneva), October 2020.

³⁹ GSER (2020). [Global Startup Ecosystem Report 2020](#).









⁴⁰ Ibid

⁴¹ UNESCO (2020). UNESCO Institute of Statistics, September 2020

⁴² WIPO (2019) World Intellectual Property Organization 2020.

a summary of the penetration of ICT skills in terms of percentage of the population for basic, standard and advanced levels. There are some disparities, especially in the advanced skills in different countries. However, overall, comparative data show a steady increase in the skills set in all Arab countries.

Figure 6: Penetration of basic, standard and advanced ICT skills as a percentage of population for selected Arab countries (%), 2019

 Oman: basic 75.4 – standard 36.7 – advanced 8	 Morocco: basic 36.6 – standard 27.8 – advanced 9.3
 United Arab Emirates: basic 72.3 – standard 60.4 – advanced 17.9	 Iraq: basic 23.1 – standard 11.3 – advanced 4.7
 Bahrain: basic 60.8 – standard 42 – advanced 18.1	 Tunisia: basic 20 – standard 17.1 – advanced 16.1
 Kuwait: basic 57.7 – standard 43.7 – advanced 13.4	 Algeria: basic 17 – standard 12.1 – advanced 6.9
 Egypt: basic 57.5 – standard 36.2 – advanced 7.9	 Djibouti: basic 15.8 – standard 12.6 – advanced 4.5
 Saudi Arabia: basic 56.7 – standard 49.6 – advanced 13.8	 Sudan: basic 3 – standard 2.2 – advanced 1.6
 Qatar: basic 44.8 – standard 30.1 – advanced 5.1	

Source: ITU (2020)⁴³.

2.5.4 Capital and resources

Availability and access to capital and finances are one of the prerequisites of a healthy ecosystem and a precondition for its further development. There are number of sources from which capital can be accessed within the ecosystem. These may include, *inter alia*, individual investors, banks or other debt-financing mechanisms, venture-capital funds, angel investors, initial public offerings (IPOs), public funding or grants/subsidies.

In the United Arab Emirates, for instance, government funding of USD 471 million in the first half of 2019 to support start-ups led to the development of many successful companies. A series of United Arab Emirates-based start-up acquisitions have been undertaken by the world's biggest companies in recent years, in particular Amazon taking over Souq for USD 580 million in 2017 and Uber's acquisition of Careem for USD 3.1 billion in 2019. At the beginning of 2020, investment in Saudi start-up companies more than doubled in relation to the same period in the previous year, and it now stands at USD 95 million, making Saudi Arabia the one of the highest-ranking MENA countries for start-up investment. Foreign direct investment (FDI) into the country has also risen to USD 4.6 billion, thanks to the country's initiatives to improve the investment climate.⁴⁴

In other countries, start-ups receive support from the World Bank (WB) and other international organizations. In Tunisia, for instance, WB has approved two projects representing a cumulative total of USD 175 million. In post-war Syrian Arab Republic, several partnerships with the United Nations have been established, mostly focusing on the country's general socio-economic well-being, including for the ICT sector. In Somalia, WB provided USD 28.5 million in 2018 to improve the institutions and stimulate growth in the technology sector, in the form of educational programmes and specialized training. In Jordan, WB invested over USD 50 million to support 200 start-ups⁴⁵.

⁴³ ITU (2021). Digital Trends in the Arab Region States 2021

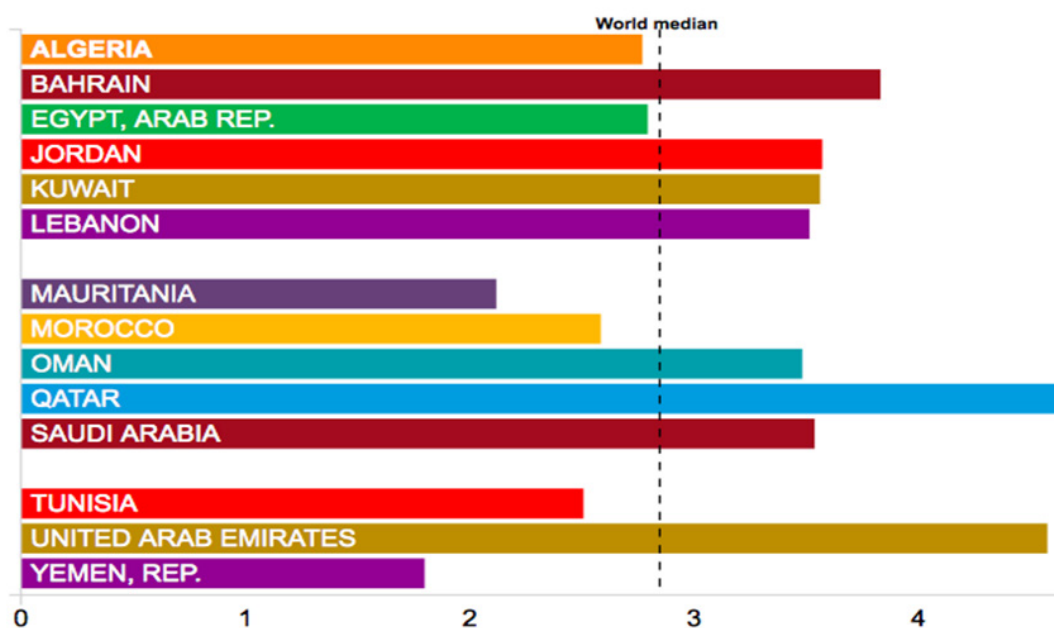
⁴⁴ United Nations Conference on Trade and Development (UNCTAD). [World Investment Report 2020. International production beyond the pandemic](#), p. 44. New York, 2020.

⁴⁵ World Bank. Press release. [Over 200 Innovative Start-Ups in Jordan to Benefit from Early Stage Financing](#). Washington DC, 23 June 2017.

Countries like Sudan and Comoros depend on foreign investment. Despite some countries' having a financial sector that offers many opportunities for foreign investors and others' proposing fiscal and non-fiscal incentives to investors, the level of investment remains low.

Figure 7 relates to the *Venture capital availability* indicator,⁴⁶ on a scale of 1-7, where 7 is best. [1 = extremely difficult to obtain funding; 7 = extremely easy]

Figure 7: Access to capital and finances



The figure clearly shows that among the Arab countries, Qatar has the highest indicator value at 4.67, whereas Yemen has the lowest indicator value at 1.80. Most of the Arab countries are above the world median in venture-capital financing. The number of venture capitalists and the amount of venture-capital funding have exceeded expectations for the region. The presence of countries with large oil reserves in the region makes it easy to attract funding for new ventures. While the world median index value is 2.8, the Arab regional median stands at 3.5. There is also a very strong correlation between the Venture-capital availability indicator and the *Ease of access to loans* indicator.⁴⁷ Most countries show a similar pattern in both indices: Qatar has the highest ease of access to loans indicator value at 5.29, whereas Mauritania has the lowest at 2.06.

Information on capital availability is not available for all the Arab countries, so it cannot be inferred that there is no venture-capital availability in the countries which are not on the above chart.

Apart from venture capital, there are also angel investors. They facilitate early stage investment which is an important step for start-ups to grow and reach more advanced investment stages. According to Konrad-Adenauer-Stiftung angel investor networks that bridge across the Maghreb countries do not yet exist; angel investment activity is relatively new in the region. Mostly these investments are provided by locals for locals or by diaspora members. In Algeria, Casbah Business Angels is a local angel investor that invests in start-ups; In Morocco, angel investments

⁴⁶ WEF GCI data. See World Bank. TCdata360. [Venture capital availability](#).

⁴⁷ WEF GCI data. See World Bank. TCdata360. [Ease of access to loans](#).

are made mostly by serial entrepreneurs or managers of major corporations; in Tunisia Carthage Business Angels (CBA), one of the major angel investor networks, was created in 2011⁴⁸.

Unlike North Africa ecosystems in Middle East (focusing on GCC countries) are more developed. Thanks to relatively developed ecosystems, many angel investor networks have emerged in countries (Lebanon Angels Investors, Dubai Angel Investors, Cairo Angels, MAIN, MBAN, etc). Diasporas were key in creating and developing these angel investor networks. The recent successes within the start-up community, encouraged others to join in the field and form a better angel investment network. For example, Careem (Mobility) was bought by Uber, its international equivalent and competitor, for USD 3.1 billion dollars. This acquisition brought Careem's angel investors (Series A) a 100x return on investment.⁴⁹

Not all types of funding mechanisms are permitted in the Arab States region on account of legal constraints. In Tunisia, for instance, crowdfunding and other types of funding are legally not permitted, which complicates the task of obtaining financing for start-ups.

In most cases, governments also extend a helping hand by providing funding to local start-ups and entrepreneurs. As an illustration, to get funding in Bahrain entrepreneurs can turn to Tamkeen, which is a semi-government body. Tamkeen proposes loans and subsidies as well as advisory services.⁵⁰ The Iraqi Government, through its Central Bank and with the participation of State-owned and private banks, encourages SMEs by loaning capital: the project is called the '1 Trillion Dinars' initiative. Some countries make funding available through incubators. For example, in Egypt the Fekretak Sherketak incubator was created by the Ministry of Investment and International Cooperation, funding local start-ups with USD 5 629 - 28 100 per start-up⁵¹:

⁴⁸ Konrad-Adenauer-Stiftung (2020). Roadmap: Maghreb Business Angels Network

⁴⁹ Ibid

⁵⁰ Tamkeen. [About us](#).

⁵¹ Invest in Egypt, 2020 Arab Republic of Egypt, [General Authority for Investment](#)

2.5.5 Markets and networks

- **Markets**

Markets are an important area to consider for further promoting development of the ecosystem in the Arab States region. An indicator for markets can comprise (but is not limited to) the following elements⁵² digital literacy and readiness (individual use, cloud migration, digitalization of government services); domestic market size (B2B, B2C, and public procurement); local market efficiency and internationalization; domestic and international corporations; marketing platforms (e-commerce, advertisement, online platforms, trade fairs); and, last but not least, the presence/existence of consumers. This component of the entrepreneurial ecosystem highlights even further the regional disparities that exist in the Arab States region. The situation is different in every country. ITU can conduct further detailed country analyses upon request of Member States.

In some countries, e-commerce is mainstreamed in a daily lives, like in the United Arab Emirates. Amazon's acquisition of the local e-commerce entity Souq was a strong message to the community. After the failed acquisition of Souq by local buyers, locally owned Noon was established and is now at the forefront of the e-commerce industry on a par with Amazon in the region. In other countries, government regulations and red tape hinder further e-commerce developments. The blocking of international payment transactions that enable to trade within the global market was quoted as one of the reasons Tunisian businesspersons could not sell abroad. With the pandemic in 2020 and the heightened need to be able to study and work online, many governments have relaxed the requirements and cut the red tape. The results will still need to be analysed by country.

The presence of multinational corporations without doubt creates a market for the development of a myriad of smaller businesses providing services to the corporations and their stakeholders. The existence of consumers is also associated with the strength of the overall ecosystem in each country.

- **Networks**

When it comes to networks and clusters, although no individual city in the Arab States region ranks in the 2019 GII top 100 cluster ranking, there are still promising trends in the right direction. GII Pillar 5.2.2 (state of cluster development) helps develop an understanding of the situation in regard to markets and networks.⁵³ Using the colour-coded system developed earlier in this report, six countries perform very well on this pillar (the United Arab Emirates is ranked 10th, Qatar 15th, Saudi Arabia 21st, Oman 24th, Bahrain 26th and Jordan 31st). The remaining countries exhibit middling performance: Egypt ranks 38th, Lebanon 56th, Kuwait 59th, Morocco 71st and Algeria 91st.⁵⁴

⁵² Aminova et al. (2020). [Entrepreneurship Ecosystem in the Arab World: The status quo, impediments and the ways forward](#). *International Journal of Business Ethics and Governance (IJBEG)*, 3(3), pp. 1-13. §2

⁵³ Comoros, Djibouti, Libya, Mauritania, the State of Palestine, Somalia, Sudan and the Syrian Arab Republic are not ranked.

⁵⁴ Cornell University, INSEAD, and WIPO (2019). [The Global Innovation Index 2019: Creating Healthy Lives – The Future of Medical Innovation](#). Ithaca, Fontainebleau, and Geneva.

Although the Arab States region does not yet have a top-100 ranked city, there are numerous networks and/or clusters that allow innovators and other ecosystem stakeholders to share resources and collaborate. These include:

- [CE3M](#): The *Cluster Electronique, Mécatronique et Mécanique du Maroc* (Electronic, Mechatronic and Mechanic Cluster of Morocco) collaborates nationally and internationally to develop innovative tech products and services and supports the needs of start-ups and SMEs in Morocco.
- [Beirut Creative Cluster \(BCC\)](#): The BCC network strives to “bring Lebanese companies together and foster collaboration, innovation and knowledge exchange, as well as encourage and enhance partnerships”.
- [Berytech](#). Berytech is an ‘Ecosystem for Entrepreneurs’ that provides “a dynamic environment for the creation and development of start-ups fostering innovation, technology and entrepreneurship” in Lebanon.
- [Dubai Internet City \(DIC\)](#). This hub in the United Arab Emirates provides access to training and mentorship programmes, networking events and access to investors. It has three innovation centres, over 180 active start-ups, prototyping labs, co-working spaces and local and international companies.

[The Next Society](#) is also a notable example of a network that engages in technology transfer in the region. This “open community of change-makers, entrepreneurs, investors, corporates, NGOs, public and private innovation, research and economic development hubs” from European countries and seven of the Arab States - Algeria, Egypt, Jordan, Lebanon, Morocco, the State of Palestine and Tunisia - works to strengthen innovation ecosystems.

Furthermore, the networks indicator extends itself into the considering the availability of Accelerators and incubators, University-industry partnerships, co-working spaces, technoparks, mentors, coaches, technical experts, advisers. These essential networks for entrepreneurs enable them to access the support mechanisms and use the lean method for starting and scaling their businesses. For instance at UAE young entrepreneurs have access to over 1770 accelerators, TechLabs, social innovation hubs, local accelerators and support and access to large companies as IBM, Microsoft, Google and others further enabling and supporting entrepreneurship growth.

The range of these support structures enable entrepreneurs and startups to either access funding for their business ideas, provide secretarial support, shared office space, access venture capital funding, supporting social enterprises; or they are the foundations empowering women entrepreneurs, innovation and startup hubs, accelerators and incubators, consulting companies, science and technology parks, knowledge hubs and others.

2.5.6 Culture and communities

Overall, the culture and perception of entrepreneurship in Arab countries remain positive. Based on the 2018 and 2019 Global Entrepreneurship Monitor (GEM), Table 6 below gives a snapshot of selected countries for which data were available in regard to entrepreneurship.

Most of the people regard entrepreneurship as a good career choice. The right-hand column shows the percentage of 18 to 64 year olds who agree with the statement that ‘in their country, most people consider starting a business as a desirable career choice’. We see that the indicators are high, for example, in Oman (where 85 per cent of the population consider entrepreneurship as a good career choice), Qatar (82 per cent) and Egypt (almost 80 per cent, up from 74 per cent in 2018).

Table 6: Societal values about entrepreneurship in Arab countries

	Country	Year	Perceived capabilities	Fear of failure rate *	Entrepreneurial intentions	High status to successful entrepreneurs	Entrepreneurship as a good career choice
1	Egypt	2019	67.26	54.79	61.58	86.15	79.97
2	Jordan	2019	61.72	54.35	29.05	85.18	76.29
3	Morocco	2019	62.37	42.52	41.93	68.37	81.52
4	Oman	2019	56.32	40.78	62.91	85.67	85.34
5	Qatar	2019	75.47	45.17	45.25	87.09	82.10
6	Saudi Arabia	2019	83.00	41.78	32.32	79.32	69.68
7	United Arab Emirates	2019	62.16	41.73	38.50	79.02	70.34
8	Egypt	2018	42.96	28.24	59.78	82.57	73.99
9	Sudan	2018	74.52	34.49	66.65	85.30	79.38

Source of data: GEM, 2020

2.5.7 Regulation and policy

As in every aspect covered in this report, there is very wide divergence within the region when it comes to socio-economic, political and legal and other indicators. Out of the 21 ITU Member States in the Arab region plus the State of Palestine on the *Ease of doing business* indicator,⁵⁵ some like the United Arab Emirates are amongst the leading countries in terms of ease of doing business score. The United Arab Emirates sits in 11th place among 190 countries of the world, thus making it not only a regional leader but also one of the top countries, despite the fact that the ecosystem in the United Arab Emirates is relatively young and most of the regulatory aspects are still in the phase of development.

It is followed by Morocco and Bahrain, which rank 60th and 62nd, respectively. Morocco also introduced a number of regulatory changes to make doing business easier. For example, among other things, it abolished the deed registration fee and stamp duties; reduced company registration fees for new businesses and introduced an online platform for reserving a company name; made dealing with construction permits easier by opening a one-stop shop; made registration of property easier by increasing transparency of the land registry and cadastre and by further streamlining the administrative procedures.⁵⁶

Oman, Tunisia and Qatar are the next Arab States after Morocco and Bahrain offering relative ease of doing business to their entrepreneurs and businesspeople. Many reforms to streamline the regulations and create more conducive conditions have been put in place. The Doing Business report classifies some countries like Somalia (190th) and Yemen (187th) as least favourable when it comes to doing business. While no major regulatory changes were observed

⁵⁵ World Bank. [Doing Business 2019](#). Training for Reform. Washington DC, 2019, p.5.

⁵⁶ Ibid, p.144

in the case of Somalia, Yemen was noted as making starting up a business more difficult owing to the suspension of registration services at the one-stop shop.

Unlike in other regions of the world, it is not possible to generalize the regulatory and policy situation in the Arab States region. The divergence is too wide between the countries within the region.

A mix of different stakeholders is evident when it comes to the digital ecosystem in the Arab States region. The ecosystem is populated by both good and average stakeholders, creating a strong digital ecosystem in some countries and a mediocre one in others. The region exhibits a wide disparity in levels of development in all areas, thus making it difficult to develop single, one-size-fits-all types of strategies for ecosystem development. Some countries are characterized by excellent ecosystem dynamics and are world leaders in various indices, whereas some others languish at the very bottom of those indices.

ITU is there to assist in further development of the Arab regional ecosystem and to support the mobilization of stakeholders to enable them to find solutions to the digital challenges of society.

3 Good practices accelerating digital transformation

This section highlights good practices that fuel digital transformation in the region, by providing a brief snapshot of each case study. Every chosen case impacts on one or more building block or “type” of ICT-centric innovation: innovation dynamics, innovation capacity and ICT innovation in key sectors. For samples of full case studies, please see **Appendix B** to this report.

3.1 Agence de Promotion de l’Industrie et de l’Innovation (Tunisia)

The Tunisian Agency for the Promotion of Industry and Innovation (API)⁵⁷ is a public establishment whose mission is to implement government policy relating to promotion of the industrial sector and capacity building of key actors in support of the development of SMEs, companies and initial financing. This practice impacts on two of the building blocks of innovation:

- **innovation dynamics**, by supporting the creation of innovation enterprises, for enhancement of market research and for cooperation between enterprises and research centres; and
- **innovation capacity**, by cooperating with national and international training organizations focusing on the development of research, training of entrepreneurs and expertise around issues relating to ecosystems and management of natural resources.

3.2 Dubai Future Foundation (United Arab Emirates)

The Dubai Future Foundation⁵⁸ builds a cohesive innovation ecosystem that includes accelerator programmes, incubators, labs, regulatory sandboxes and knowledge platforms – all with the purpose of challenging the status quo and designing a future-ready city powered by future leaders and disrupters.

IT impacts on all three building blocks of innovation:

- **innovation dynamics**, by enhancing high-level thought and strategic initiatives that create space for bold, exponential change while ensuring that the regulatory and financial ecosystems evolve to fit innovation ecosystems;
- **innovation capacity**, by connecting corporate and government entities with leading start-ups, ideators, researchers, entrepreneurs and students of all ages – to solve challenges, create solutions and co-create; and a better tomorrow.
- **ICT innovation in key sectors**, by developing initiatives that help strengthen Dubai’s position as an international city and mitigate the impact of COVID-19 on infrastructure, urban planning, the environment and the methods of managing and governing future cities.

⁵⁷ [Agence de Promotion de l’Industrie et de l’Innovation \(Tunisia\). API presentation.](#)

⁵⁸ Dubai Future Foundation (United Arab Emirates). [“The future belongs to those who can imagine it, design it, and execute it. It isn’t something you await, but rather create”.](#)

3.3 Industrial Modernization Centre (Egypt)

Egypt's Industrial Modernisation Centre (IMC)⁵⁹ supports targeted industrial enterprises – individually, geographically and sectorally – according to business-development plans through comprehensive programmes aiming at green growth and sustainable development. The aim of its services is to support industrial enterprises in strategic sectors. Its goal is creating an enabling business environment for the industrial sector, in coordination with the Ministry of Industry, Trade and SMEs.

This practice impacts on **innovation dynamics**, by forming a public-private partnership consisting of various representatives from the public sector, such as the Ministry of Industry, Trade and SMEs and its relevant affiliates, alongside the private sector, for example in the Federation of Egyptian Industries, export councils and investors' associations, all with respective responsibilities.

3.4 Jordan Enterprise Development Corporation (Jordan)

Jordan's Enterprise Development Corporation (JEDCO)⁶⁰ is a governmental organization dedicated to supporting the development of emerging businesses and SMEs in Jordan by providing specialized and focused technical assistance, and access to finance. Its mission is to be the leading institution in Jordan for upgrading the industry and export promotion.

This practice impacts on **innovation dynamics**, by developing Jordanian enterprises and companies in order to improve their productivity and competitiveness, through adopting high-calibre technical methods and to benefit from skilled and competent staff.

3.5 Morocco Climate Innovation Centre (Morocco)

Morocco's Climate Innovation Centre (MCIC)⁶¹ is the first clean-tech hub in the region. Its mission is to support green- and clean-technology entrepreneurs from Morocco and the Middle East in the design, development and launch of their projects and start-ups. Its aim is to boost the entrepreneurial spirit and to support the creation and development of companies in the field of renewable energies and green technologies on Moroccan territory. This practice impacts on two of the three building blocks of innovation:

- **innovation dynamics**, by providing access to a network of over 160 Moroccan green businesses, and access to a Green Business Advisory that provides services and training to clean-tech entrepreneurs to enhance their competitiveness in local and international markets; and
- **innovation capacity**, by putting in place a coaching and mentoring system for green entrepreneurs and certified training programmes reinforcing competences and skills through networking and local expertise.

⁵⁹ Ministry of Trade and Industry (Egypt). [Industrial Modernization Centre](#).

⁶⁰ Ministry of Industry and Trade and Supply (Jordan). [Jordan Enterprise Development Corporation](#).

⁶¹ InfoDev (World Bank group). [Morocco Climate Innovation Centre](#).

3.6 Mosul Space (Iraq)

Iraq's Mosul Space⁶² is the first local community for youth work on education, innovation, entrepreneurship and technology and provides 'makerspaces', co-working areas and training programmes. Mosul Space provides a place where creative people who like to learn new things and try them with their hands can share ideas and knowledge, work together on practical projects and help each other with their projects, be it graduation, study, work, or even an idea for a company or emerging products. This practice impacts on all three building blocks of innovation:

- **innovation dynamics**, by connecting young entrepreneurs to national and international networks to gain experience and knowledge about how to operate one's business locally, nationally or internationally;
- **innovation capacity**, by offering workshops, training and special events like global entrepreneurship week or hackathons; and
- **ICT innovation in key sectors**, by including entrepreneurship ecosystem development in the area of mobile applications.

3.7 Agence Nationale de Promotion et de Développement des Parcs Technologiques (Algeria)

Algeria's National Agency for the Promotion and Development of Technoparks (ANPT)⁶³ is responsible for the establishment of a national ecosystem enabling economic activity in the ICT sector to develop and flourish, with the aim of ensuring its effective participation in the national economy. This practice impacts on all three building blocks of innovation:

- **innovation dynamics**, by enhancing the development of an ecosystem favourable to ICTs through the creation of technology parks, establishing a culture of innovation and encouraging an entrepreneurial spirit;
- **innovation capacity**, by collaborating with the National Institute of Post and ICT and other academic centres to offer training and improve the process of incubation for young entrepreneurs; and
- **ICT innovation in key sectors**, by accompanying innovation activities in any sector where ICT and mobile technologies can contribute (e.g. agriculture, urban planning, water management).

3.8 Palestinian Information Technology Association (State of Palestine).

The Palestinian Information Technology Association of Companies (PITA)⁶⁴ represents over 150 ICT companies in Palestine. PITA enhances the ICT business environment to better enable an industry that will grow Palestinian economic and intellectual capital. This practice impacts on all three building blocks of innovation:

- **innovation dynamics**, through PITA's programming, content, events and global outreach, through which the Association is now poised to not only continue advancing in its mission towards innovation, but also to serve as the driver for the region's start-up ecosystem;
- **innovation capacity**, by facilitating business development training programmes; and

⁶² Mosul Space (Iraq). [Supportive community for creative minds](#).

⁶³ See Oxford Business Group. [Incubator funds directed to Algeria's technoparks](#).

⁶⁴ Palestinian Information Technology Association of Companies (PITA) (State of Palestine). [Overview - Learn more about PITA mission and vision](#).

- **ICT innovation in key sectors**, by working in four key ICT areas: policy, sector branding, entrepreneurship and start-up development, and human capital, which can provide supporting services for enterprises and start-ups.

3.9 Qatar Science and Technology Park (Qatar)

The Research, Development and Innovation (RDI) ecosystem of the Qatar Foundation (QF) was created to place Qatar at the forefront of scientific research and technological advancement. A centrepiece of this ecosystem is the Qatar Science and Technology Park (QSTP),⁶⁵ which operates across four overarching themes: energy, environment, health sciences and ICTs. For a decade now, QSTP has been driving the development of new high-tech products and services, supporting the commercialization of market-ready technologies, and contributing to the economic diversification of Qatar. This practice impacts on two building blocks of innovation:

- **innovation capacity**, by hosting an incubator centre that supports start-ups, including the provision of office rental space, assistance in developing prototypes, mentorship from experts, training in innovation and entrepreneurship, innovation mindset education, IP, R&D and other relevant regulations; and
- **ICT innovation in key sectors**, by hosting activities in sectors including energy, environment, health sciences and ICT.

3.10 Smart Dubai 2021 (United Arab Emirates)

The United Arab Emirates's Smart Dubai⁶⁶ is the government office entrusted with facilitating Dubai's citywide smart transformation, in order to empower, deliver and promote an efficient, seamless, safe and impactful city experience for residents and visitors. Consisting of multiple ambitious projects, Smart Dubai is aiming to make Dubai, *inter alia*, the happiest place to live on earth through technology innovation. This practice impacts on all three building blocks of innovation:

- **innovation dynamics**, by hosting labs, clusters and corporate accelerators, and exchanging best ICT-centric innovation policy-making practices with other clusters;
- **innovation capacity**, by providing mentorship, training and e-learning opportunities in ICTs; and
- **ICT innovation in key sectors**, by achieving full ICT-enablement of critical infrastructure and resources to boost efficiency, availability and resilience.

3.11 Syria Digital Lab (Syrian Arab Republic)

The Syrian Arab Republic's Syria Digital Lab⁶⁷ aims to explore this space - its opportunities, risks and potential - to create an effective digital ecosystem that identifies, connects, incubates, accelerates and sustains Syrian-led digital initiatives. Syria Digital Lab brings together talented Syrian tech developers and entrepreneurs from around the world and links them with donors, civil-society organizations and the private sector in a collaborative effort to that help solve

⁶⁵ Qatar Foundation (Qatar). Qatar Science and Technology Park. [Where technology goes to work.](#)

⁶⁶ Smart Dubai (United Arab Emirates). [Our vision is to make Dubai the happiest place on earth.](#)

⁶⁷ Syria Digital Lab (Syrian Arab Republic). [Unlocking the potential of the Syrian digital space.](#)

some of the country's most pressing challenges. This practice impacts on two building blocks of innovation:

- **innovation capacity**, by fostering a global community of Syrian techpreneurs, teaching entrepreneurs to tell their stories, organizing workshops and hosting webinars, guiding entrepreneurs through their business development journeys, educating them on effective market research, teaching project management and even holding presentation training workshops; and
- **ICT innovation in key sectors**, by creating an ecosystem powered by technology and ensuring the digital solutions selected can operate effectively in the Syrian Arab Republic.

3.12 World Innovation Summit for Education (Qatar)

Qatar's World Information Summit for Education (WISE),⁶⁸ established by the Qatar Foundation in 2009, promotes new approaches to education and investigates new ways to address pressing global education challenges. WISE is a response to the necessity of revitalizing education and providing a global platform for the development of new ideas and solutions. Since 2009, WISE has evolved into a thriving global, multisectoral community, which continues to generate fruitful dialogue and productive partnerships.

This practice impacts on two of the building blocks of innovation:

- **innovation capacity**, by hosting events, workshops and an accelerator; and
- **ICT innovation in key sectors**, by publishing research on education and facilitating the design of new and innovative approaches to global education challenges.

⁶⁸ Qatar Foundation. World Information Summit for Education (Qatar). [WISE](#).

Appendix A – Methodology

This appendix describes the project’s research methodology. The first section explains the research goals and methods of the report as a whole. The subsequent sections explain: (a) the necessary definitions to understand the report, namely the engines of growth, enablers of digital transformation, Ecosystem Maturity Map and good practices; and (b) the data-collection and analysis methods used for each section.

A.1 Research goals and methods

The goals of this research were to: (a) understand the state of the Arab States region’s ICT-centric innovation ecosystem; (b) understand the state of the region’s ICT-centric innovation capacity based on the three engines of growth (technology ecosystem, entrepreneurial ecosystem and innovation ecosystem); (c) provide a comparative ranking of the region’s ICT-centric innovation ecosystems; and (d) identify good practices from the Arab States region that can be used to build sustainable digital innovation ecosystems with ITU’s digital innovation framework.

This framework was first introduced in the ITU report *Bridging the digital innovation divide: A toolkit for strengthening ICT-centric ecosystem* published in 2017, and subsequently updated in the 2020 report *Bridging the digital innovation divide: A toolkit for developing ICT centric ecosystem projects*.⁶⁹ It enables countries to understand the challenges of their digital innovation ecosystems and grasp the opportunities to create ICT start-ups, nurture talent and develop specific guidelines and recommendations, initiatives, programmes and projects to help create new jobs and new growth based on best practices.

This report was compiled primarily using desktop research and some survey methods. ITU collected evidence on the overall digital innovation ecosystem in the region using sources including peer-reviewed academic journal articles; books; government websites; reports from government, intergovernmental and non-governmental agencies and the private sector; and national and regional newspapers. In some cases, surveys were sent to collect additional information where possible, for example, on details of a good practice.

A.2 Monitoring ICT-centric ecosystems

The three engines of growth

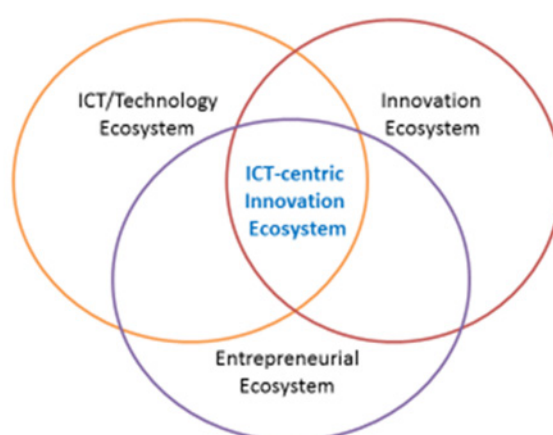
The three engines of growth are key to a country’s digital transformation journey. They are: (a) the national innovation ecosystem, (b) the entrepreneurial ecosystem and (c) the technology ecosystem.

- **National innovation ecosystem:** The national innovation ecosystem – which includes research institutions, academia and public-sector entities such as national innovation agencies and public-sector financial institutions – plays an invaluable role in the national innovation journey, particularly in kick-starting innovation.

⁶⁹ ITU. BDT. Op. cit. (Footnotes 2 and 3)

- **Entrepreneurial ecosystem:** This includes the entrepreneurs, their support systems and the organizations that initially guide the formation of enterprises through the “valley of death” and subsequently nurture their growth as SMEs. Often, tech start-ups that have the potential to become high-growth firms end up as SMEs because of the lack of a market or appropriate business models. These support networks enable them to achieve their full potential.
- **Technology ecosystem:** The technology ecosystem includes high-growth technology companies and the ecosystems that support them. These include high-tech companies, their original equipment manufacturers (OEMs), system integrators, firms in ICT sectors and business-to-business (B2B) technology platforms that support SMEs. These companies and their ecosystems are integrated into local or global value chains. The development of this ecosystem is critical to a country’s ability to leverage technological innovation and create high-growth industries and jobs.

Figure A.1: The three engines of growth



Source: ITU

A country’s ICT-centric ecosystem is where the three engines of growth intersect. In an immature ecosystem, the three engines of growth lack synergy: ecosystem stakeholders operate in silos and do not align their initiatives towards a common vision. By contrast, in a mature ecosystem, players in the three engines of growth understand their roles and perform them individually while also working together to create policies and initiatives that enable a thriving digital innovation environment. Understanding and assessing the ecosystem makes it possible to identify the enablers needed to achieve the national vision. Enablers include programmes, policies and initiatives that foster digital transformation.

Data collection and analysis

On this understanding, data were collected by consulting published global indices, which can serve as a proxy for the three engines of growth. The indices are published by reputable academic institutions, international organizations and non-profit organizations.⁷⁰

The *Global Innovation Index* (GII) measures and ranks countries’ efforts and success in innovation. The *ICT Development Index* (IDI) measures ICT infrastructure and access, level of ICT use in

⁷⁰ As mentioned previously, the indices are: (a) the [ICT Development Index \(IDI\)](#), published by ITU; (b) the [Global Innovation Index \(GII\)](#), published annually by Cornell, INSEAD and WIPO; (c) the [Global Competitiveness Index \(GCI\)](#), published annually by WEF; and the (d) the [Global Entrepreneurship Index \(GEI\)](#), published annually by GEDI.

society and the impact of efficient and effective ICT use. The Global Competitiveness Index (GCI) is published in WEF's Global Competitiveness Report. This index measures 12 pillars that the organization has identified as essential to national competitiveness, namely: (a) institutions; (b) infrastructure; (c) ICT adoption; (d) macroeconomic stability; (e) health; (f) skills; (g) product market; (h) labour market; (i) financial system; (j) market size; (k) business dynamism; and (l) innovation capability. The *Global Entrepreneurship Index* (GEI) measures 14 entrepreneurship-enabling pillars: (a) opportunity perception; (b) start-up skills; (c) risk acceptance; (d) networking; (e) cultural support; (f) entrepreneurship by choice (rather than necessity); (g) technology absorption; (h) human capital; (i) competition; (j) product innovation; (k) process innovation; (l) high growth; (m) internationalization; and (n) risk capital.

ITU analysed and colour-coded the information from these major indices to create the *ICT-Centric Innovation Performance monitor*. The monitor provides a comparative assessment of the ecosystem's performance according to the three engines of growth both within and between countries in the region. In this way, the monitor can be used to reflect a set threshold for action by decision-makers.

A.3 Monitoring the enablers of digital transformation

The seven enablers of digital transformation

ITU's toolkit, *Bridging the digital innovation divide: A toolkit for strengthening ICT-centric ecosystems*, introduces the Ecosystem Canvas. It is a tool to help stakeholders understand the environment that innovators and entrepreneurs face when undertaking the journey to bring their ideas to market. The Ecosystem Canvas has seven pillars, each of which is a crucial component of an ICT-centric innovation ecosystem.

The seven pillars are:

- **Vision and strategy:** This pillar asks: How is the ecosystem currently performing? What vision do the stakeholders have for how it will perform? What needs to be done to take the ecosystem from its current state to its ideal future state?
- **Infrastructure and programmes:** This includes both hard infrastructure (such as connectivity, roads, electricity and public transportation) and soft infrastructure (including knowledge-sharing mechanisms like tech hubs, training resources and research institutions). Programmes can take advantage of this infrastructure to support the ecosystem.
- **Talent and champions:** Talent is the ecosystem's human capital. Talented individuals should possess hard skills such as engineering and programming, as well as soft skills like management, communications and administration. A champion is a person who plays a leadership role in the ecosystem by initiating change, building cornerstone institutions and encouraging the contributions of new actors.
- **Capital and resources:** Start-ups cannot succeed without capital and resources. In the early stages, they need risk capital (such as from angel investors). As they mature, venture capital and private equity funds help them grow. The majority of this funding should come from private investors. To complement the work of financing start-ups directly, support networks and other ecosystem-building programmes need resources in order to operate successfully.
- **Markets and networks:** Start-ups need markets to serve. It is important for innovators and entrepreneurs to understand the depth of market need and access locally, regionally and internationally. Governments are often a significant purchaser of products and services, and a source of contracts for up-and-coming enterprises. Transparent public-procurement

processes are useful for start-ups. Networks and clusters are also needed in ecosystems to ensure that innovators have access to all of the resources and connections they need.

- **Culture and communities:** An innovative, entrepreneurial culture encapsulates key values such as risk-taking, an appreciation for failure and a willingness to iterate and learn. These values create a blueprint for behaviour across ecosystem stakeholder groups, exhibited by communities of innovators and champions through events and activities.
- **Regulation and policy:** Supportive policies and regulations can provide fertile ground for the efforts of entrepreneurs and innovators, while poorly developed policies can stifle innovation. There are a number of areas of policy and regulation that are critical to the success of the innovation ecosystem, including taxation, trade policy, intellectual property law, financial regulation and business regulation.

Within a country, these pillars provide the necessary ingredients to nurture digital entrepreneurship and innovation, looking at a more granular level when the three engines of growth come together.

Data collection and analysis

For this report, desktop research was conducted using this framework to examine what is happening in an ecosystem and identify problems and possible solutions. The pillar framework identifies countries' performance in each of the seven pillars, contributing to an understanding of their individual performance and their performance relative to the region.

A complementary quantitative and qualitative approach could also be used to obtain the information needed for this framework; however, owing to the complexity of collecting these data for all countries, this report is limited to desktop research.

Any country interested in a comprehensive analysis of its ecosystem should request technical assistance from ITU to develop a profile of its digital innovation ecosystem.

A.4 Monitoring the Ecosystem Maturity Map

Once there is an understanding of global and regional performance indicators, and an understanding of the enablers and indicators of digital transformation, it is crucial to understand the entrepreneurial lifecycle, which helps explain how innovation can move from ideas to creating small and medium-sized businesses, high-growth firms and, ultimately, world-class exports.

The job-to-be done framework

Harvard economist Clay Christensen, while studying the theory of disruptive innovation by companies, realized that the traditional ways in which companies deliver products and services to serve markets can be ineffective in creating competitive solutions and lasting companies.⁷¹ The 'job to be done' is the need described by the customer that the product or service fulfils. If a product or service does not answer a need or desire, it is unlikely to sell, no matter how innovative it is.

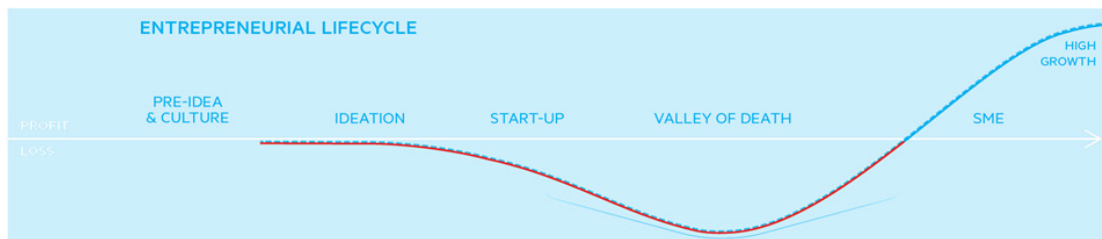
In the context of the innovation journey, most statistics will show that 90 per cent of SMEs fail because they cannot sustainably deliver the right products and services to market. Yet they are

⁷¹ Clayton M. Christensen, Scott Cook and Taddy Hall (2005). [Marketing Malpractice: The Cause and the Cure](#). *Harvard Business Review*. December 2005.

expected to be the engine for job creation and to grow into mature firms. What is required of stakeholders to ensure innovation flourishes?

The entrepreneurial lifecycle shown in Figure A1.2 describes what must be done to create growth and economic inclusion. Therefore, for an innovation-driven economy to be competitive, the job to be done is to nurture innovators on this journey to develop ideas into businesses.

Figure A.2: The entrepreneurial lifecycle



Source: ITU

The job to be done does not change from country to country, or from community to community. However, the approach to this job and ways the job is done can change based on the context (such as opportunities) and stakeholders' actions. For example, in Silicon Valley, financiers have a strong appetite for high growth and collaboration, which means that they will support innovators much longer through the valley of death until they can figure out a strong global business model that creates high-growth firms.⁷² In locations with fewer resources and less collaboration, stakeholders' actions may end up creating barely sustainable innovations which never grow. Without access to the right resources and collaboration, innovators will lack appropriate talent to create strong businesses, enabling policies that nurture them or access to value chains from established companies.

The question now remains: Who is doing what job in this journey?

This is why ITU has developed the Ecosystem Maturity Map (also known as the Stakeholder Interface Canvas), which is adapted from the valley-of-death curve. This tool helps map the roles and actions of stakeholders at each stage of the start-up lifecycle. Once the map is completed, it offers some guidance on how relevant a practice may be to a country or community. Failure to focus ecosystem interventions in the right practice element can waste valuable ICT investment and offer no relief to the competitiveness of a country's ICT ecosystem.

The figure below represents a colour-coded version of the Ecosystem Maturity Map for Country A.

⁷² Reid Hoffman and Chris Yeh (2018). [Blitzscaling](#). LinkedIn.

Figure A.3: Colour-coded Ecosystem Maturity Map for Country A

Entrepreneurship Phase	Pre-Idea	Ideation	Startup	The “Valley of Death”	SME
Entrepreneurs	Entrepreneurial Interest	Engage with problems	Develop Business Models	Build Collaboration	Expand
Finance	Research Funding	Seed Funding	Angel Investment	Venture Capital	Business Finance & Loans
Entrepreneurial Support	Entrepreneurial Events	Hackathons & Competitions	Co-working & Support	Incubators & Accelerators	Business Association
Private Sector	Success Stories	Research Programs	Lab programs	B2B & Support Services	Skill Training Programs
Academia	Entrepreneur Community	Basic Research	Spin Offs	Soft skill trainings	Human capital
Public Sector	Vision & Strategy	IP & R&D Support	Tax Support	Public Procurement	Trade Policy

Source: ITU

In this country’s ICT-centric ecosystem, most stakeholders are not sufficiently performing the necessary roles to enable a thriving ecosystem. While the entrepreneurial support networks are performing quite well, entrepreneurs, academia and the public sector must significantly improve their work in each stage of the entrepreneurial lifecycle. The private sector and the finance sector have some practices that are working, but for the most part are in significant need of improvement if the country is to develop a competitive ecosystem with world-class firms and high-growth exports.

- **For more information about this canvas, download the Ecosystem Maturity Map here.**

Data collection and analysis

On account of time constraints, and given the extensive level of engagement with stakeholders required to determine the maturity level of an ecosystem, the ICT-Centric Innovation Policy monitor introduced in Section 2 has only been effected at the country level.

However, for the purpose of this report, it is necessary to understand how each good practice impacts on each of the micro-jobs to be done. For detailed, country-level information, Member States are invited to contact ITU to develop a Digital Innovation Profile for their country.

A.5 Monitoring good practices

Why use good practices?

A good practice is a proven practice that yields evidence-based impact and successful results and can be scaled up and replicated. Good practices are needed to help:

- develop flagship projects;
- comparatively assess the strengths and weaknesses of a practice; and
- undertake evidence-based policy or programme development.

Good practices enable actors to effortlessly add value to their ecosystem initiatives. However, a good practice should not be replicated “as is”, because every ecosystem and every project is different.

ITU has developed the Good Practice Canvas, a framework for understanding the blueprint of any practice. Practices examined through the canvas can then be replicated in other ecosystem projects, where they can add value and increase their chances of succeeding.

1.5.2 Good Practice Canvas

Figure A.4: The Good Practice Canvas



Source: ITU

This tool, composed of seven core pillars, helps the user extract the blueprint of working practices (including key function breakdowns of these practices, along with their corresponding key performance indicators (KPIs) and success stories). The result is a promising blueprint that will enable stakeholders to choose the specific building blocks of a good practice that they would like to adopt, replicate and share. The seven pillars of the Good Practice Canvas are explained below:

- **Practice:** A short description of a practice, the country or city where it is used, a tagline for a practice (if any) and an elevator pitch, or a one- to three-sentence description.
- **Type:** This refers to the building blocks of ICT-centric innovation: (a) guiding innovation dynamics, (b) building innovation capacity (c) and integrating ICT innovation in key sectors.
- **Goals:** This refers to the practice's specific objectives, target stakeholders and the desired outcome for the ecosystem.
- **Key activities:** This pillar refers to events, related initiatives, processes and other activities to offer insights into the operating processes of your practices.
- **Governance:** This pillar asks for relevant information about organizational structure (such as flat or hierarchical), management (leadership structure and long-term driver or vision) and institutional frameworks (such as NGO, government agency, etc.), and the competencies (skills and functional roles) required to carry out the practice.
- **Resources:** This refers to critical elements such as financial and non-financial resources, e.g. human capital, equipment and processes. Additionally, an understanding of key

partnerships for the practice is also helpful as many non-financial resources are derived from partnerships. Furthermore, knowing the funding sources for a specific practice is useful when replicating it, as it can help identify suitable stakeholder groups that can provide the required resources.

- **Achievements:** This is where the practice is evaluated, on the basis of the following criteria:
 - *replicability*, or how easily it can be copied to a different context;
 - *scalability*, or the practice's scope in achieving its goals; and
 - *evidence of impact on the ecosystem*, or the practice's effectiveness in achieving its goals and results, which refers to outcomes based on KPIs set by the practice.

Types of good practices

As mentioned throughout this report, good practices are organized around three key types which denote how they impact on the overall ecosystem: (a) guiding innovation dynamics, (b) building innovation capacity and (c) integrating ICT innovation into key sectors. To have a competitive ecosystem, it is necessary to have a combination of all these practices.

Guiding innovation dynamics

- **Is innovation on the map? How supportive of innovation is the general environment?**

This first category, **guiding innovation dynamics**, refers to practices that enable digital innovation to exist. They support the general innovation environment.

Innovators need a suitable business environment, enabling policies and key programmes to develop appropriate technology solutions. Often, there are many policies and incentives in the general environment that promote entrepreneurship or sectors, but only for non-digital innovators. Thus, existing practices may need to be updated while new policies are developed to close the gaps.

A dynamic innovation environment requires regulatory and organizational settings which are coherent and which guide, facilitate and promote innovation culture, mindset, projects and programmes. Countries need a clear roadmap, vision and strategy, and key initiatives, [created through](#) "enabling policies, regulations, and rules balancing the old analogue and the new digital economy".⁷³

Each stakeholder in the ecosystem must be able to benefit from their country's environment and work together rather than in silos. Entrepreneurs, for example, must have the means and knowledge to create appropriate solutions for their communities.

Good practices that guide innovation dynamics balance stakeholder collaboration and market forces in a way that will drive innovation, public-private partnerships and access to international markets. For example, policies such as reducing the cost of investment and fiscal and financial policies can attract international start-ups, while start-up visas can attract talent. Start-up policies for growth could include tax incentives and funding incentives.

Often, practices have a regulatory basis to guide innovation dynamics, but they may not be effective, inclusive or operational. The practices may be lacking mechanisms for execution, or

⁷³ ITU. ITU-D. Innovation. [Accelerating Digital Transformation: Good practices for developing, driving and accelerating ICT centric innovation ecosystems in Europe](#). Geneva, 2018. _

competing instead of creating synergies through collaboration. Traditional innovation agencies are an example of this type of practices because they mostly operate in the innovation ecosystem – one of the engines of growth. Newer organizations are needed to tackle the problems of coordination, trust and cooperation that currently confront lagging ecosystems. These agencies need to work across the three engines of growth to nurture cross-stakeholder collaboration in countries.

Building innovation capacity

- **Are innovators equipped with the right tools, skills, know-how and resources to succeed?**

The second category of good practices is **building innovation capacity**. These practices enable a sufficiently well-developed infrastructure and talent pool with access to resources in the ecosystem to solve problems in their community. They equip innovators with the right tools, skills, spaces and resources to succeed.

There is a need to provide adequate skills and knowledge as well programmes that encourage success. In globalized digital economies, access to skills and know-how has been democratized, with the many online MOOCs from reputable organizations, for example. Yet many communities struggle to access knowledge and resources. Lack of access to decent skills-development initiatives and content as well as a lack of spaces and programmes that enable innovators inhibit the innovation capacity of entrepreneurs, especially in developing countries.

Innovation hubs, tech parks, lab programmes and other similar arrangements involving multiple stakeholders have sprung up around the world during past few years to address the growing needs of ecosystems. Whether formal or informal, innovation infrastructures – which are essential for building an ecosystem's innovation capacity – are usually clustered around higher-learning institutions. When domestic capacity is insufficient, access to regional or global networks and resources becomes necessary.

Lastly, innovators need a continuum of funds to bootstrap and develop their ideas. Without these resources, much of the ecosystem struggles. Collaborative models with academic institutions and among entrepreneurial support institutions and private-sector companies are essential in developing such capacity to ensure that talent is well equipped.

Integrating ICT innovation into key sectors

- **Is ICT innovation integrated across key sectors?**

The third and final category is good practices that help **integrate ICT innovation into key sectors** so that start-ups and SMEs can realize their full potential and scale up beyond their niche, enabling transformation across other industries.

Ecosystems must focus on national development priorities and make linkages to other ecosystems. Without such focus and linkages, innovators will struggle with entry and scale-up to unlock opportunities. One place where they can find quick alignment is in the public sector. This is particularly important for start-ups, who can take advantage of government demand. This helps innovators with product testing, validation, establishing credibility and growing, while also helping the government digitalize its services.

Innovative entrepreneurial ICT ventures realize their full potential when they can tap into other industries beyond ICT. This is where the potential for digital transformation is greatest. Here, collaboration with the private sector plays a vital role. By partnering with start-ups, corporations benefit from new ideas, circumvent corporate red tape to test new innovations, rapidly create prototypes and benefit from the flexibility of entrepreneurial culture. At the same time, start-ups benefit from this partnership by accessing resources and infrastructure.

Another example is a cluster development initiative in which the ICT sector can drive innovation in non-ICT sectors. Cluster focus in a sector can help SMEs and large businesses digitally transform their value chains by enhancing their ability to create and deliver value in the marketplace. Here, the linkages between ecosystems and global networks of collaboration are important.

Data collection and analysis

Good practices were identified through pre-existing knowledge, desk research and networks. Data on each practice were collected through desk research, interviews with the practice owners and/or surveys; and analysed according to the pillars of the Good Practice Canvas (introduced in §1.5.2 above). Using the canvas, the pillars of each practice are presented in the full case studies in **Appendix B** to this report.

Appendix B – Full case study samples

This Appendix sets out two full case studies from the good practices in the Arab States region identified in the report. The case studies are mapped onto the pillars of the Good Practice Canvas, by providing:⁷⁴

- an overview of the **practice**, including its **goals** and **target stakeholders**;
- the **type** of case study;
- its **governance** structure;
- its **partners** and **resources**;
- its **achievements**.

To access all the case studies in their entirety, please contact the ITU Digital Ecosystems Thematic priority at ITU-RO-ArabStates@itu.int.

B.1 Agence de Promotion de l'Industrie et de l'Innovation (API) (Tunisia)

Overview

The [Agency for the Promotion of Industry and Innovation](#) (API) is a public establishment created in 1972 under the Ministry of Industry, Energy and Mines and responsible for the implementation of the government's policies relating to promotion of the industrial sector. API likewise provides a support structure for companies and promoters as well as a network of services for entrepreneurs and enterprises.

Type

API impacts primarily on the two first building blocks of innovation: innovation dynamics and innovation capacity.

Goal(s)

API is a public establishment whose mission is to implement government policy relating to promotion of the industrial sector, capacity building of key actors in support of the development of SMEs and companies and initial financing.

Target stakeholders

In order to support the development of entrepreneurship in the Tunisian regions, API conducts regular in-depth analysis and identification of promising investment niches, particularly within the fabric of SMEs and through coordination with national actors like the *Agence Nationale pour l'Emploi et le Travail Indépendant* (National Agency for Employment and Self-employment) (ANETI) through its offices for employment and self-employment (BETIs); the Regional Development Office for the South (ODS); and the *Banque Tunisienne de Solidarité* (Tunisian Solidarity Bank) (BTS). API also seeks the strengthening of coordination mechanisms

⁷⁴ Note that, in some case studies, detailed information was not available on some of the pillars of the Good Practice Canvas.

between the academic sector (universities and vocational training institutions), the private sector (companies, professional organizations such as UTICA,⁷⁵ UTAP,⁷⁶ CNFCE⁷⁷ and others), financial institutions, the sectoral administrations concerned and the municipalities.

Governance

API is a governmental organization which is financially and administratively autonomous, with a board of directors chaired by the Minister of Industry, Energy and Mines and an appointed CEO or general director.

Under its umbrella, API is organized into five support centres offering services from its headquarters and 24 regional offices:

- Assistance Centre for Enterprise Incorporation and Management of Investment Incentives (CFGGA)
- Observation Centre for Industrial Surveys (CEPI)
- Centre of Innovation and Technological Development (CIDT)
- The Industrial Documentation and Information Centre (CDII)
- Support Centre for Enterprise Establishment (CSCE).

Resources and partners

There are two major instruments of financing: TAAHIL Invest and TAAHIL Credit. For each instrument there are TND 25 million, or approximately USD 9.15 million (value at November 2020).

TAAHIL Invest's main objective is to participate in strengthening the equity capital of companies participating in development programmes. TAAHIL Invest's participation in the capital of companies is materialized by the signing of an agreement with SAGES Capital (shareholders' agreement) which stipulates in particular the deadlines and terms of exit from the fund. TAAHIL Credit is a credit line mobilized from the State budget, which targets SMEs operating in industrial and industry-related services with a threshold of TND 1 million given to any enterprise.

Additionally, API cooperates with national donors like the *Confédération des Entreprises Citoyennes de Tunisie* (CONNECT) or [Tunisia Jobs](#) to promote financing and assistance tools for the development of SMEs. It also cooperates with international donors such as the *Institut de la Recherche pour le Développement* (French National Research Institute for Sustainable Development) (IRD) in France and the [Enterprise Europe Network](#) (EEN), focusing on the development of research, training of entrepreneurs and expertise around issues relating to ecosystems and natural resource management, the development of bioenergy, nutrition and health, governance, and economic and social dynamics.

Activities and events

API has created structures that support the creation of business and promotion of innovation. A single Contact Point serves as a centre for administrative and legal formalities bringing together, in a single space, the various administrations involved in the completion of formalities for

⁷⁵ UTICA: [Union Tunisienne de l'Industrie, du Commerce et de l'Artisanat](#) (Tunisian Union of Industry, Trade and Handicrafts) [in French]

⁷⁶ UTAP: *Union Tunisienne de l'Agriculture et de la Pêche* ([Tunisian Union of Agriculture and Fisheries](#)).

⁷⁷ CNFCE: *Confédération Nationale des Femmes Chefs d'Entreprises* ([National Confederation of Women Entrepreneurs](#)).

business creation: investment project declarations and company formation. API also undertakes investment and other studies that serve to assist the government in establishing appropriate strategies for business development at national and regional level.

API, as a member of the EEN and coordinator of the EEN Tunisia consortium, actively supports individuals and enterprises in their search for partners. To do so, it invites interested parties to consult the EEN network business opportunities database and to send expressions of interest in relation to the offers of opportunities that they would like to be put in touch with.

Achievements

According to a survey by the Centre for Young Leaders and the Konrad Adenauer foundation, API is considered as one of the better-performing State structures in Tunisia. This is partly due to its transparency in procedures, client-oriented service and direct relationship with the SMEs, and its management of an ecosystem composed of 30 business incubators ('*pépinières*') and nine technology parks ('*technoparcs*') which provide business development support to firms across all stages of business creation. Private-sector players in the ecosystem include one business angel network (Carthage Business Angels), 13 incubators and accelerators and 16 private equity/venture capital funds and other investors.

Impact on the entrepreneurial life cycle

API has instilled good practices in **building collaboration, venture capital, incubators and accelerators, success stories, skills training programmes, spin-offs, and B2B and support services.**

B.2 Dubai Future Foundation (United Arab Emirates)

Overview

[Dubai Future Foundation](#)'s vision is to position Dubai as a leading city of the future. It aims to collectively imagine, inspire and design Dubai's future. The Foundation seeks to pair forward-thinking public and private-sector organizations and start-ups using the city of Dubai as a living testbed to co-create solutions for the global and local challenges of tomorrow.

To achieve its vision, the Foundation launches initiatives under five strategic areas of focus that collectively help move Dubai towards becoming a leading city of the future:

- *Future foresight and imagination*: Dubai Future Councils, Dubai Future research
- *Content knowledge and dissemination*: Dubai Future Talk, Mustaqbal
- *Capacity building*: One Million Arab Coders
- *Future design and acceleration*: Dubai Future Accelerators, Dubai 10x, Area2071
- *Future experiences*: Museum of the Future.

Type

The Dubai Future Foundation impacts on all three building blocks of innovation: innovation dynamics, innovation capacity and ICT innovation in key sectors.

Goal(s)

The goal of Dubai Future Foundation is to reimagine, inspire and design Dubai's future in collaboration with public and private-sector partners, aspiring to make Dubai one of the world's foremost future cities. The Foundation targets the five strategic areas outlined above, and each of the initiatives has its own vision and goal(s).

Target stakeholders

The target stakeholders of the Dubai Future Foundation are society in general, and Dubai's government in particular. Every initiative has its own target stakeholders. For instance, *One Million Arab Coders* targets young people with a passion for and interest in coding and technology; *Dubai Future* targets Dubai's government and aims to propose short- and long-term recommendations based on local, regional and global trends.

Governance

Dubai Future Foundation is led by HH Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum, Crown Prince of Dubai, Chairman of the Executive Council and Chairman of the Board of Trustees of the Dubai Future Foundation, supported by the [Board of Trustees](#) consisting of high-level civil servants. The Foundation is governed by a leadership that champions its cause of future-readiness, supports employees in going the extra mile, and creates an ecosystem that encourages taking risks and bringing innovative ideas to life in order to achieve the Foundation's mission.

Resources and partners

Since its inception in 2015, the Foundation has entered into partnerships with organizations such as UNESCO, the Mohammed bin Rashid Space Centre, the Shenzhen Foundation for International Cooperation, and General Electric. It has also established the World Federation of Future Sports. As part of a strategy to help shape the future of Dubai, Sheikh Mohammed launched an AED 1 billion (USD 270 million) 'Future Endowment Fund' to invest in innovation, and a 'Future Cities' programme to develop sectors deemed crucial in helping Dubai to become a 'smart city', including energy, transport and infrastructure.⁷⁸

Currently, Dubai Future Foundation works in collaboration with partners in [AREA 2071](#), including the United Nations, IBM, Procter & Gamble, SAP, Emirates, Ernst & Young, Pfizer, Wamda Capital, GEMS Education and other prominent entities. More recently, Dubai Future Foundation and UNESCO signed a partnership agreement to establish the [DFF-UNESCO Futures Literacy Hub](#), a global platform aimed at promoting futures literacy (FL). The agreement mandates members of the Global Futures Literacy Network to work closely with participants from around the world to implement action-learning activities and deploy on-the-ground methods to cultivate futures literacy. In September 2020, Dubai Future Foundation and Dubai International Financial Centre (DIFC) signed an MoU to drive the future of finance in the region.

Activities

- *Dubai Future Academy* organizes, for instance, various courses, e.g. Exploring Future Scenarios, Essentials of Blockchain, Ethics of Foresight, Foundations of Futures Literacy, Connecting the Future, The AI revolution, and others.

⁷⁸ Arabian Business. [Dubai launches \\$270m 'Future Fund' to shape growth](#). 25 April 2016.

- *One Million Arab Coders (OMAC)* develops digital literacy in Arab youth, ensuring their readiness for the future and preparing the next generation of technology experts. OMAC achieves this through a digital platform that provides online programming courses accessible by Arab youth around the world. In addition to the courses, OMAC organizes hackathons, and initiatives to find solutions to the most pressing challenges of the world.
- *Dubai Future Talks* is an online platform that gathers a global community of visionaries, change-makers and pioneers to share their experiences, insights and research with the world. By sharing video content that is inspiring, engaging and digestible, Dubai Future Talks spearheads conversations about the future.
- *AREA 2071* is a unique ecosystem that nurtures global talents to start and grow their business in the United Arab Emirates. Members of AREA 2071 have access to a network of strategic partners, entrepreneurs and investors.

Events

- *Emirati Futurism Award*: This a national design competition to re-imagine what the future looks like, under the patronage of HH Sheikha Latifa bint Mohammed bin Rashid Al Maktoum, Chair of the Dubai Culture and Arts Authority and member of the Dubai Council. The award seeks to combine authentic Emirati culture with futuristic technologies to re-imagine what the future of the United Arab Emirates looks like.

Impact on the entrepreneurial life cycle

Dubai Future Foundation has instilled good practices in **incubators and accelerators, lab programmes, soft-skills training, skills training programmes** and **human capital**.

B.3 Industrial Modernization Centre (IMC) (Egypt)

Overview

Egypt's economic development critically hinges on the competitiveness and growth of the industrial sector. By occupying an integral position in the economic structure, Egyptian industry is considered to be the engine of economic growth, expansion of exports and job creation.

Within this context, Egypt's [Industrial Modernization Centre \(IMC\)](#) was established by Presidential Decree No. 477/2000 to give impetus for a sustainable, modernized, vibrant and competitive and innovative Egyptian industry.

IMC was established with the vision of becoming a leading change agent for Egyptian industry. It was successfully born out of the Industrial Modernization Programme (IMP) as a sustainable industrial development agency, supporting all Egyptian industrial enterprises to gain a competitive position in global markets. IMC embraces a new approach that establishes a solid partnership between all stakeholders to establish the industrial sector as the chief engine for growth, employment creation and export enhancement in the Egyptian economy.

Type

IMC impacts primarily on the first building block of innovation: innovation dynamics.

Goal(s)

The main goal of IMC is to support targeted industrial enterprises, individually, geographically and sectorally, according to business development plans, through comprehensive programmes aiming at green growth and sustainable development. The purpose of its services is to support industrial enterprises and create an enabling business environment for the industrial sector, in coordination with the Ministry of Industry, Trade and SMEs.

Target stakeholders

IMC's approach to achieving sustainable industrial development seeks direct public support to industrial enterprises, rendering them fit to compete domestically and globally. Competitiveness programmes are carefully designed to cater for the various needs of the range of industrial enterprises, recognizing the different types of support needed for each enterprise according to its size, activity and readiness.

Governance

IMC was established by Presidential Decree in December 2000 to give impetus for a sustainable, modernized, vibrant and competitive Egyptian industry.

It is composed of one head office in Cairo and 15 branches across Egypt. IMC is led by a Chief Executive Director assisted by a Deputy Director.

Resources and partners

Together with the Egyptian industrial community, IMC is forming a public-private partnership consisting of various representatives from the public sector, such as the Ministry of Industry, Trade and SMEs and its relevant affiliates, alongside the private sector, for example in the Federation of Egyptian Industries, export councils and investors' associations, all with respective responsibilities.

All partners are committed to the following values:

- Involvement and commitment vis-à-vis the development process
- Mutual trust shared by all partners
- Transparency in all transactions
- Good governance regarding all issues
- Embracing corporate social responsibility (CSR) and sustainable development
- Supporting comprehensive and sustainable human resource development
- Confidentiality of information and business knowledge.

Activities and events

IMC generally supports enterprises with 10 workers or more, leaving room for the Social Fund for Development to pursue its own objective of supporting microbusiness enterprises. The beneficiary should be a private industrial entity (or one related to industrial services) that has been in operation for at least two years, employs more than 10 full-time registered workers and does not operate within a free zone.

IMC started delivering services from 2002, and built up its portfolio on a demand-driven basis, thereby maintaining a dynamic approach to accommodate the needs and ongoing challenges of industry.

In this domain, IMC has made a significant contribution and is still doing so, with a wealth of assets to share: some 300 professional staff members working on reaching the Egyptian industrial community through 19 geographically dispersed branches and 50 sectoral development studies. So far, 100 000 services have been provided to 13 000 clients across nine industry sectors.

In addition to support to already registered enterprises, special entrepreneurship and start-up programmes are being instituted to cater for the needs of entrepreneurs seeking investment in the industrial sector or in business services related to industry.

Achievements

IMC's achievements include:

- Launch of Creative Egypt programme in 2015, benefiting 108 companies, 80 entrepreneurs and over 20 000 artisans
- Comprehensive outreach through 17 branches
- Team of 270 professional staff
- Over 13 000 clients, and over 100 000 services across nine industry sectors
- Completion of more than 50 sectoral development studies/strategies
- Provision of capacity building to various entities within the Ministry of Trade and Industry in key strategic and green areas (e.g. green economy and renewable energies).

Impact on the entrepreneurial life cycle

IMC has instilled good practices in a government organisation that supports the development of **Enterprises** and offers three core **business development programs for competitiveness** as well as **national supplier and regional cluster development programs**. It provides **skill training programs in key strategic trade areas (e.g. renewable energies)**.

B.4 The Jordan Enterprise Development Corporation (JEDCO) (Jordan)

Overview

The [Jordan Enterprise Development Corporation](#) (JEDCO) is a governmental organization dedicated to supporting the development of emerging businesses and SMEs in Jordan. It was founded in 2003 through a decree promulgated by the Council of Ministers. As a new entity dedicated to developing the SME sector's performance nationally and globally, JEDCO replaced the Jordan Export Development and Commercial Centres Corporation, which had been established in 1972.

Over the years, JEDCO's key tasks expanded to target enterprises at all stages of the business lifecycle. The Corporation's services focus on offering support to improve competitiveness and growth locally and internationally, promoting local products in global markets and increasing the volume of exports to target markets, focusing on countries that have Free Trade Agreements with Jordan.

Type

JEDCO impacts on innovation dynamics.

Goal(s)

The main goal of JEDCO is to develop productive and innovative enterprises with a focus on the industrial, service and agribusiness sectors in Jordan. The corporation offers tailored technical and financial support to selected projects, aiming to improve their competitiveness and foster their growth locally and internationally through innovation.

Target stakeholders

JEDCO has been established to support emerging businesses and SMEs in Jordan, with a particular focus on high-growth businesses.

Governance

The Corporation is a governmental organization which is financially and administratively autonomous, with a board of directors that is chaired by the Minister of Industry and Trade and whose members represent an equal number of private-sector and public-sector stakeholders.

The organization is composed of several directorates, among which we may highlight the Directorate for Industrial support; Operation support services; New ventures for business incubators and growth accelerator; Financial support tools and technological development and networking support unit.

Resources and partners

Being a public organization, JEDCO is mainly funded by the government. However, some of JEDCO's projects are financed by the G7 Deauville Partnership - MENA Transition Fund through the EIB Facility for Mediterranean Investment and Partnership (FEMIP).

JEDCO cooperates with academic and industrial partners nationally and internationally, such as the like the Higher Council for Science and Technology, chambers of trade and industry, tourism, ICT and entrepreneurship or the Enterprise Europe Network (EEN), to develop international connections.

Activities and events

JEDCO offers projects and programmes for emerging enterprises, new entrepreneurs, SME owners and innovative and high-growth SMEs. Among its services are:

- Mentorship and consultancy services for emerging businesses and SMEs
- Access to research, statistics and data regarding local and international markets
- Technical and financial support to develop and improve enterprises' competitiveness, capabilities and administrative, technical and exporting capacities
- Facilitating the financing of SME projects.

In addition, JEDCO acts as an advocate for the SME sector in Jordan through:

- Analysing and seeking to improve government policies on the SME sector
- Promoting an entrepreneurial scene and culture in Jordan.

JEDCO offers accelerators, including the following components:

- Identifying growth needs and challenges faced by emerging businesses and SMEs with growth potential. Based on the findings of each study, selected projects are assisted in their growth through a customized development plan including, where required, access to sources of financial support.
- Establishing a talent pool of 72 Business Growth Coaches to provide coaching support to high-growth participating businesses and offering Masterclasses in key areas of business to increase skills sets and build capacity.
- Establishing an SME Growth Observatory which collects accurate information about the SME sector, monitors the performance of companies and evaluates the effectiveness of SME policies in order to make evidence-based recommendations to policy-makers.

Achievements

One noteworthy development is JEDCO's being tasked in 2012 with management of the Governorate Development Fund (GDF), a Royal Initiative that has helped the Corporation to contribute to development of the entrepreneurial sector outside the capital, Amman.

JEDCO is leading the project "IP Capacities for Smart, Sustainable and Inclusive Growth in the MEDiterranean Region" (IPMED), which is implemented under ENI CBC MED, a cross-border cooperation initiative programme funded by the EU in 2020. The goal is to develop SMEs, promote economic and social development and support innovative entrepreneurs' projects. The project intends to grant IPR access to 1 000 young men and women in the Mediterranean area and provide young innovators with the tools they need to transform from job-seekers to creators. It has benefits from funding of EUR 1 million in the form of an EU contribution, and has a total budget of EUR 1.1 million.

Impact on the entrepreneurial life cycle

JEDCO has instilled good practices in **collaboration, venture capital, incubators and accelerators, success stories** and **B2B services**.

B.5 Morocco Climate Innovation Centre (MCIC) (Morocco)

Overview

The [Morocco Climate Innovation Centre](#) (MCIC) was launched in 2014 by the Moroccan Solar Energy Agency (MASEN), with the support of InfoDev - a World Bank group programme to promote entrepreneurship and innovation - and the Moroccan Ministry of Industry, utilizing the administrative structure of Cluster Solaire. It is the first clean-tech hub in the North African region.

MCIC reinforces the actions carried out within the framework of the Moroccan solar plan and aims to deepen the synergies between the actors of the renewable energy sector, in order to promote the emergence of a competitive solar industrial sector in Morocco.

Type

MCIC impacts mainly on two building blocks of innovation: innovation dynamics and innovation capacity.

Goal(s)

The goal and mission of MCIC is to support green- and clean-technology entrepreneurs from Morocco and the Middle East in the design, development and launch of their projects and start-ups. This is in line with the Moroccan Government's strategy for combating climate change.

Target stakeholders

MCIC represents a stepping-stone towards better understanding of the great potential of climate technology and targets local SMEs as well as entrepreneurs as key stakeholders.

The Centre represents a key instrument in enabling local industry players to insert themselves more effectively into the value chains of major projects, such as the Ouarzazate solar power station also supported by the World Bank. MASEN, the World Bank Group and Cluster Solaire are major stakeholders in this organization.

Governance

MCIC applies the same administrative structure as Cluster Solaire. It is led by its President. The Board of Directors is composed of 16 members, from whom a president and a vice-president are elected by the General Assembly.

The Centre's management team comprises four members: a general manager, a business development manager, a green entrepreneurship manager and a support manager. The operational bodies are supported by permanent thematic working groups for the establishment of action plans according to their scope of intervention.

Resources and partners

The Morocco Climate Innovation Centre (MCIC) is funded by the Moroccan Ministry of Industry and MASEN and receives technical assistance support from Germany's international cooperation corporation, *Gesellschaft für Internationale Zusammenarbeit* (GIZ). The Centre's own budget, without further investments, for the first five years of existence was USD 6.3 million. The most important line in the MCIC budget remains funding (grants), with 30 per cent of the budget. Networking and facilitation of access to technical, commercial and financial information on Climate Technologies alone account for 37 per cent of this budget, while management and administration of MCIC accounts for around 20 per cent.

Membership in MCIC provides access to a network of over 160 Moroccan green businesses, as well as access to a Green Business Advisory that provides services and training to clean-tech entrepreneurs to enhance their competitiveness in local and international markets. An International Finance Corporation project strengthens MCIC by adapting its business model, improving the impact of its services, including through working better with different local ecosystem partners, and expanding the Centre's business network to include more local and international investors and mentors.

There are two main instruments of financing. INTILAK funds may finance up to USD 116 279 per project (90 per cent of total cost of the project). This applies to SMEs in the launch phase. TATWIR funds of up to USD 465 116 per project (50 per cent of total cost) may be allocated for SMEs that are in the upscaling or reorientation phase. Partners of the Green Business Booster are Cluster Solaire, Caisse Centrale de Garantie (CCG) and the European Bank for Reconstruction and Development (BERD). In partnership with Cluster Solaire, AMEE and AMISOLE, a green

financing event for SMEs was organized in June 2019. The meeting presented existing green financing mechanisms on the market in favour of Moroccan companies involved in renewable energy projects and energy efficiency.

Activities and events

MCIC reinforces and complements the World Bank's support to Morocco as the country enacts a pioneering plan to develop and install a range of clean-energy options - by 2020, the country aims to produce 42 per cent of its total electricity from renewables. By building local capacity in the solar sector - especially among entrepreneurs and SMEs - MCIC allows local companies to participate more in development of large concentrating solar power plants that the World Bank is supporting through loans. It also sets up a coaching or "mentoring" programme for each company it supports financially.

MCIC organizes technical training, green hackathons, seminars and conferences like the Climate Technology Forum. The Centre provides financing, mentorship and advisory services to the growing number of local clean-tech entrepreneurs operating in the solar energy sector. MCIC has also expanded the scope of its activities and the reach of its services by joining Cluster Solaire, a collaborative platform that brings together local enterprises, academia and R&D institutes operating in the solar energy sector. In 2019, it launched the Green Business Booster, a two-year investment readiness support programme for clean-technology start-ups. The start-ups receive five days of training, one-on-one sessions and networking opportunities with various ecosystem actors.

Achievements

MCIC provides access to a network of over 160 Moroccan green businesses. Some

16 start-ups have been accelerated by the Green Business Booster. The Centre participated in the CBIN peer-learning event in Ghana, helping to share and learn best operational practices with other CICs. It has participated in the MicroMentor online mentoring platform that was piloted with CCIC. Six MCIC start-ups were invited to participate in the World Bank's Climate Technology Programme for Product and Engineering Support in Casablanca in December 2018.

Impact on the entrepreneurial life cycle

MCIC has instilled good practices in **engaging with problems, business finance and loans, soft-skills training, public procurement and entrepreneurial interest.**

B.6 Mosul Space (Iraq)

Overview

Iraq's [Mosul Space](#) is the first local community for youth work on education, innovation, entrepreneurship and technology and provides makerspaces, co-working areas and training programmes. On 22 May 2014, before ISIS attacks on Mosul, an idea arose to create a community that brings youth together in order to make something different and share ideas, experiences

and projects. To combat the effects of poor education and a narrow-minded community, the founders decided to provide a place that could lead the unguided efforts of youth.

Although its development was delayed, Mosul Space has nonetheless contributed to supporting the community through many technical events and development programmes, electronics-building sessions, entrepreneurship training, etc., both in and outside Mosul. Mosul Space also repaired a number of medical devices in four hospitals in Mosul city using digital manufacturing and 3D-printing techniques available at the time.

Mosul Space is the first Makerspace aimed at improving youth skills in technology, entrepreneurship, innovation and education and providing the best environment for them in aspects such as materials, suitable premises and supervisors. It aims to train young people in how to follow the labour markets in order to start their own successful projects. This space, where makers can gather, provides required tools, labs, workshops and mentors.

Type

Mosul Space impacts on all three building blocks of innovation: innovation dynamics, innovation capacity and ICT innovation into key sectors.

Goal(s)

The main goal of Mosul Space is to provide a place where creative people who like to learn new things and try them with their hands can share ideas and knowledge, work together on practical projects and help each other with their projects, be it graduation, study, work, or even a company idea or emerging product.

Its goal is to see the young people whose skills it develops are acquainted with proper job opportunities and continue to develop themselves, and to see the entrepreneurs it helps enter the market with their companies and achieve success with their career.

Target stakeholders

Key stakeholders like private and public donors contribute to spreading a culture of entrepreneurship in Mosul and connecting the entrepreneurs to international networks to enable them to gain experience and knowledge about what is going on in the outside world.

Governance

Mosul Space is a non-profit NGO founded by Abdullah AlFakhrey, comprising a Community Manager, a General Manager and six other employees that support the local community for creative people in Mosul and help innovators and aspiring entrepreneurs to transform their ideas into products.

Resources and partners

Mosul Space offers small business owners, entrepreneurs and freelancers a group workplace where they can reserve a seat to work on their projects in a suitable environment, as well as a strong network of relationships with other business owners.

It runs training programmes and has a training hall where people who want to develop their skills can join the training programmes in Mosul Space and register in their desired field when

registration opens. Other organizations can also reserve the hall to provide training related to youth development.

Most of all, is providing a motivational work environment with a wide network of skilled business owners and youth to link them together for future work.

Activities and events

Mosul Space is an innovation hub in Mosul, working to develop the private sector by supporting young entrepreneurs in starting or scaling up their projects and supporting young new graduates with capacity-building programmes and networking with the market to help them find a job. Mosul Space's vision is to build a strong innovative community of leaders in technology and business, which is being achieved through its four main programmes:

- Makerspace programmes
- Co-working space and mentoring
- Capacity-building programmes in tech and business
- Business incubation programmes.

In December 2019, Mosul Space organized the first Mosul Global Entrepreneurship event, sponsored by GIZ. It also organizes TED talks, Global Entrepreneurship Weeks, etc. For example, TEDx Youth Medan was the first TED event organized in Mosul city, at which 12 resilience stories of the city were presented.

Achievements

In collaboration with the Iraq Innovation Alliance, Mosul Space organized the first nationwide hackathon, Iraq Innovation Hackathon, bringing together 731 young entrepreneurs from five cities.

In 2019, more than 15 training courses on ICT and entrepreneurship skills were conducted through the innovation hubs. More than 300 young Iraqis participated in them, of whom around 30 per cent were women.

Mosul Space delivered 90 face shields to Mosul hospitals, made using 3D printers and laser-cutting technology, and continues to produce other tech solutions in response to COVID-19.

Impact on the entrepreneurial life cycle

Mosul Space has instilled good practices in **engaging with problems, building collaboration, venture capital, success stories, B2B and support services** and **skills training programmes**.

B.7 Agence Nationale de Promotion et de Développement des Parcs Technologiques (ANPT) (Algeria)

Overview

The [National Agency for the Promotion and Development of Technology Parks](#) (ANPT) is a public industrial and commercial enterprise (EPIC), created by Executive Decree No. 04-91 of 24 March, 2004 under the supervision of the Ministry of Post and Telecommunications.

ANPT is responsible for the establishment of a national ecosystem enabling economic activity in the ICT sector to develop and flourish, with the aim of ensuring its effective participation in the national economy.

As such, its role is to boost the ICT sector and promote greater technological penetration within Algerian society. Concretely, its mission lies in the validation, implementation and generalization of ICTs. It ensures the establishment of the tools, mechanisms and skills necessary for the development of a national ecosystem that is conducive to the expansion of an ICT industry serving various sectors of the Algerian economy.

Type

ANPT is present in all three building blocks of innovation: innovation dynamics, innovation capacity and ICT innovation in key sectors.

Goal(s)

The main goal of this agency is to enhance the development of an ecosystem favourable to ICTs through the creation of technology parks, establish a culture of innovation and encourage an entrepreneurial spirit.

Target stakeholders

ANPT aims to bring together all the national stakeholders, namely regulators, telecom operators, manufacturers, researchers, start-ups and project leaders, as well as international actors like the European Union.

Governance

ANPT is managed by a CEO or managing director (MD) who is appointed by presidential decree based on the proposal of the minister responsible for SMEs, start-ups and the knowledge economy. The MD implements the guidelines set by the Board of Directors, which is made up of government representatives. He/she develops and proposes to the Board of Directors the general organization of the agency. The MD acts on behalf of the agency, signs contracts, incurs expenses and represents the agency in court and in civil acts, and exercises hierarchical authority over all agency staff.

There are eight main directorates reporting to the MD, including, *inter alia*, directors in charge of Information systems; Town planning and infrastructure; Incubation and training; Development and partnerships.

Resources and partners

In 2018, ANPT was allocated funding of DZD 15 billion (approximately EUR 115 000) by the National Investment Fund (FNI) as part of the action plan for the completion of its four technoparks. Resources are also obtained through the establishment of a programme to attract national and foreign investors (soft landing). ANPT has a Business Centre which houses a large number of ICT professionals in its premises, which are animated and full of life by virtue of the various forums, events and social and cultural initiatives organized there and thanks to the excellent synergy between employees and employers.

ANPT also engages in cooperation with the EU. In 2017, a cooperation agreement was signed for EUR 1.4 million between the EU and the Government of Algeria, which is managed by the Ministry of Commerce through its P3A Programme Management Unit (UGP3A), with the goal of improving the partnership network for the purpose of innovation; strengthening the supervision of ICT research and development; reviewing the incubation process; and revitalizing the Sidi Abdellah cyberpark.

Other key partners come from within the industrial, telecommunication and education sector. Just recently, on 26 October 2020, a partnership agreement was signed between ANPT and the college ESI Sidi Belabes for the benefit of the students as well as to promote entrepreneurship and the creation of technological start-ups in the region.

Activities and events

By virtue of the assets at its disposal (e.g. technology parks), ANPT provides ICT economic operators with spaces for professional use, equipped with a full range of services and amenities necessary for their daily activities. Thanks to its expertise, ANPT also offers study, design and/or development engineering services for professional purposes.

Within the confines of its purpose, its mission and its competences, ANPT, through its various directorates, creates, organizes and manages any event aimed at the dissemination of scientific and technological information and encouraging the spirit of innovation and scientific creativity, on its own behalf or on behalf of a public institution, a private company or even an individual. The events revolve around specific themes, in the form of:

- seminars, conferences, workshops; and
- coaching and training programmes.

Achievements

ANPT's achievements include the development of four technology parks in Algeria, with an investment plan of DZD 6 billion to build certain structures of the Sidi Abdellah cyberpark in Algiers, DZD 4 billion for the Annaba technopark, DZD 2.5 billion for the construction project of the technopark in Oran, and more than DZD 2 billion for the technopark in Ouargla. Of 33 projects monitored, 10 have evolved into successful start-ups. The economic impact for the country exerted by the companies which are hosted within the various structures of ANPT far exceeded EUR 6 million in 2018.

Impact on the entrepreneurial life cycle

ANPT has instilled good practices in **vision and strategy, building collaboration, incubators and accelerators, success stories, B2B and support services** and **skills training programmes**.

B.8 Palestinian Information Technology Association of Companies (PITA) (State of Palestine)

Overview

The [Palestinian Information Technology Association of Companies](#) (PITA) is a consortium with more than 150 major ICT companies in Palestine's emerging technology and start-up ecosystem. PITA has become the driving force in advancing the ICT sector's interests, and the leading information source about this sector in the State of Palestine. Based in Ramallah, PITA was founded in 1999 by a group of Palestinian entrepreneurs with the vision of creating a non-profit organization to advance the interests and positive societal impact of Palestine's ICT sector.

Through its programming, content, events and global outreach, PITA is now poised to not only continue advancing in its mission towards innovation, but also to serve as the driver for the region's start-up ecosystem.

Type

PITA impacts on the three building blocks of innovation: innovation dynamics, innovation capacity and ICT innovation in key sectors.

Goal(s)

The main goals of PITA are:

- To operate efficiently, effectively and sustainably, contributing to a better world
- To enhance the ICT business environment to better enable an industry that will grow Palestinian economic and intellectual capital
- To reach out and engage effectively with the global ICT sector and better position the State of Palestine as a wonderful place to do something totally new
- To ensure that sufficient qualified human capital exists in the State of Palestine to boost the ICT sector and attract new immigrants and investors to this region of the world
- To strengthen the competitiveness of Palestinian ICT enterprises in local and international markets.

Target stakeholders

The Palestinian private ICT sector is organized and governed by PITA as a strong, established ICT association. PITA has a vibrant advocacy policy with a view to positively affecting and influencing the government's ICT regulations. It also has open communication channels with a range of key decision-makers and major stakeholders in the Palestinian community to help advance the ICT sector.

Likewise, another key stakeholder is the Palestinian Investment Promotion Agency (PIPA), which was established to act as the main gateway for any potential local or foreign investors, through the provision of investment guaranties, policy advocacy and incentives that facilitate the investment process, to enhance the Palestinian investment climate, and to help investors make good decisions.

Governance

PITA is led by a Board of Directors, which provides local guidance and insight for PITA's member companies, acting as a key driver in helping to spearhead the quest for innovation. The Board is composed of a chair, a vice-chair, a treasurer, a secretary and four other members. They are all committed to embracing the next generation of entrepreneurs, who represent the future.

PITA's management team has its pulse on Palestine's emerging ICT and start-up economy. It thereby helps promote a culture of collaboration, mentorship and education - all aimed at advancing our region's economic and social capital. The management team is composed of a Managing Director, an administrative assistant, a project coordinator, a project officer and a finance officer. PITA also has the benefit of a liaison office in Gaza.

Resources and partners

PITA continues to work with global organizations, who recognize the value of leveraging the country's greatest asset: its people. Given today's technology, access to the global, social Internet, and an entrepreneurial culture, the State of Palestine's strategic location in the Middle East makes it an ideal location for innovation.

Among its key partners, we may cite:

- Palestine Information and Communications Technology Incubator (PICTI), an independent Palestinian non-profit NGO created at the initiative and with the support of the Palestinian IT community, which serves as entrepreneurial support network
- *Deutsch-Palästinensischer Wirtschaftsrat* (German-Palestinian Business Council) (DPW)
- *Agence française de développement* (French Development Agency) (AFD)
- World Information Technology and Services Alliance (WITSA)
- United States Agency for International Development (USAID).

Activities and events

- PITA works in four ICT areas - policy, sector branding, entrepreneurship and start-up development, and human capital - and can provide support services for enterprises and start-ups. PITA plays an active role in providing incentives for its members through different incentive programmes, such as adopting a code of conduct to be signed by members of PITA. It provides and enforces standards for operation and pricing through a certification programme of PITA members. Members can use PITA's name in promoting their products, through the use of a seal of quality for PITA members.
- PITA publishes a newsletter and 'Digital Palestine', which provide a lot of information on the Palestinian ICT sector.
- PITA can fulfil all an enterprise's capacity-building needs through its business development training programmes.

Achievements

PITA is a strong and sustainable platform representing and benefiting the ICT sector. It represents more than 150 Palestinian companies for the ICT sector. It has 14 qualified staff in the West Bank

and Gaza available to implement PITA's activities. The country's fully digital telecommunication infrastructure has been entirely developed by the Palestinian private sector. No less than 40 per cent of Palestinian technology companies are engaged in outsourcing projects for multinational companies. The country has seen a 50 per cent increase in the number of Palestinian graduates employed by IT firms (Palestinian or otherwise), with successful R&D initiatives.

Impact on the entrepreneurial life cycle

PITA has instilled good practices in skills training programmes, hackathons and competitions, building collaboration, IP and RD support and support of incubators.

B.9 Qatar Science and Technology Park (QSTP) Qatar

Overview

The Research, Development and Innovation (RDI) ecosystem of the Qatar Foundation (QF) was created to place Qatar at the forefront of scientific research and technological advancement, addressing national needs while generating global impact. A centrepiece of this ecosystem is the [Qatar Science and Technology Park \(QSTP\)](#), which operates across four overarching themes: energy, environment, health sciences and ICTs.

Goal(s)

The main goal of QSTP is to facilitate the development of new high-tech products and services, and support the commercialization of market-ready technologies – leading to investment, job creation and economic impact through fostered research, development and innovation (RD&I).

Type

This practice impacts on two of the building blocks of innovation: innovation capacity and ICT innovation in key sectors.

Target stakeholders

QSTP is part of a unique ecosystem made up of stakeholders from the private and public sectors as well as academia, including a cluster of eight leading international and homegrown universities, primary and secondary schools, research centres and policy institutes, and various scholastic and community-focused entities. This unique ecosystem is designed to leverage synergies across disciplines and sectors to bring new technologies, matured in Qatar, into the global marketplace.

Governance

QSTP is part of Qatar Foundation Research, Development and Innovation (QF-RDI), and a free zone and Qatar's hub for applied research, technology innovation, incubation and entrepreneurship, with direct support of the State of Qatar.

Initiated by HH Sheikha Moza bint Nasser in 2002, and located within QF's Education City, QSTP is part of a unique ecosystem that comprises a cluster of eight leading international and homegrown universities, primary and secondary schools, research centres and policy institutes,

and various scholastic and community-focused entities. QSTP is led by an Executive and assisted by a Central Steering Committee composed of directors responsible for Innovation; Park and Free-Zone Management; Investment; Technical Facilities; and Product Development and Grants Management Fund. QSTP has around 1 000 staff, which includes all individuals that work at the science park for QSTP entities, as well QSTP's management. QSTP aims to grow Qatar's knowledge economy by encouraging companies and institutes from around the world to develop and commercialize their technology in these sectors in Qatar.

Resources and partners

In 2004, an initial five-year investment in research and training at QSTP of USD 50 million from General Electric (GE) was unveiled at a ceremony at QF's headquarters, following a meeting between HH Sheikha Mozah Bint Nasser Al Missned, Chair of QF, and David Calhoun, Vice-Chairman of GE, the donor foundation.

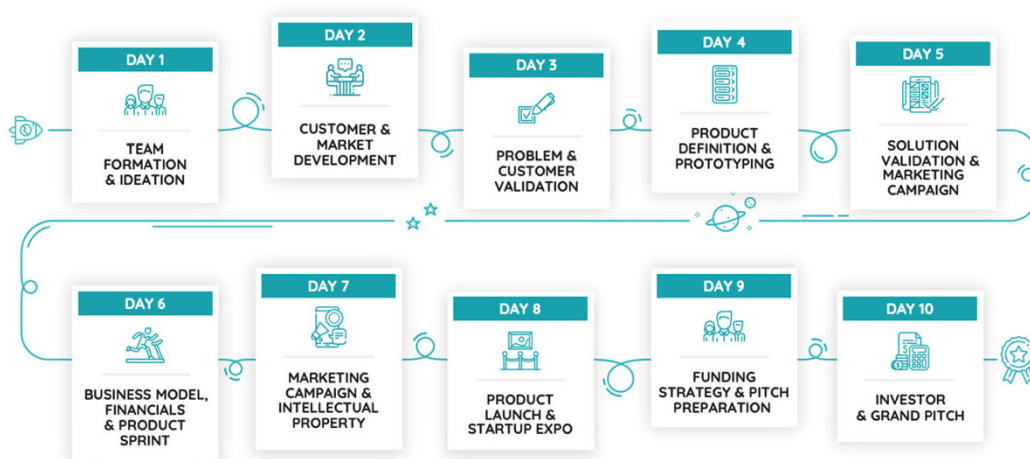
QSTP has several partnerships. For example, an extension to their existing agreement with Total was signed in 2019, allowing Total Research Centre-Qatar (TRC-Q) to continue its R&D operations in the QSTP Park and Free Zone for another 10 years.

Additional partners include Shell, CISCO, Microsoft, Iberdrola, SAP, Siemens, Rosneft, IRD and Mitsubishi.

Activities and events

QSTP runs several initiatives. The Research to Start-up programme was created to support the research community in Qatar by providing a complementary pathway for commercializing intellectual property and launching new tech start-ups. The programme aims to bridge the divide between industry and academia by facilitating interactions between serial tech entrepreneurs and research institutes, creating new tech ventures with the ability to attract investors and license intellectual property developed in Qatar.

QSTP offers the XLR8 accelerator programme, which consists of a 10-week programme offering intensive training and mentorship, enabling promising innovators to transform tech-based ideas into commercially viable businesses. QSTP has also created an Arab Innovation Academy (AIA). AIA is the first and largest tech-entrepreneurship programme in the Middle East, challenging and supporting participants to create a new start-up in just 10 days (see the figure below).



Additionally, a QSTP Incubation Centre was established to deliver technology-focused programmes that aim to foster local tech entrepreneurship in Qatar.

Achievements

QSTP can boast significant achievements and far-reaching impact in transforming Qatar into a global hub for technological innovation in the Gulf region.

Since 2016, 20 local companies run by 66 entrepreneurs have been incubated, including Airlift, Contactless.io, NavBuddy, Skora, Skyscart and others.

QSTP has:

- signed an agreement with 500 start-ups – the first such agreement in the region – enabling QF to cement its position and role as an anchor facilitator in the regional innovation ecosystem;
- designed and launched a ‘Technology Venture Fund’ targeted at making seed-stage and early-stage investment in technology start-ups, and led the effort to create ‘Qatar Science and Technology Holding’ to execute and manage the fund;
- launched a new incubation centre, and associated programmes, policies and processes;
- taken its output from 0 to 15 start-ups in a few months;
- launched the new ‘Product Development Fund’ (PDF), focused on encouraging the private sector in Qatar to build and launch new products, with five PDF agreements already closed;
- introduced several new programmes aimed at improving services and intra-community relationships within the QSTP tenants community, including food trucks, laundry services, visitor centre, weekly tech seminars (Tech Bites), etc.;
- launched the ‘Research to Start-ups’ programme in partnership with a global venture capital company, Wasabi Ventures, aimed at facilitating the spin-out and creation of start-ups and new licensing opportunities – the first pilot programme included six projects from Qatar Computing Research Institute.

Impact on the entrepreneurial life cycle

QSTP has introduced good practices in **developing business models, building collaboration, seed funding, incubators and accelerators, success stories, IP & R&D support, B2B and support services, skills training programmes, human capital and public procurement.**

B.10 Smart Dubai 2021 (United Arab Emirates)

Overview

The vision of [Smart Dubai](#) is to make Dubai the happiest city on earth. The initiative was launched in 2014 to focus the city’s unified effort towards its most valued asset – its people. Dubai also aims to become the smartest city in the world by harnessing digital innovation. It aims to take its smart-city transformation to a level such that digital transformation has a significant and positive impact on the city.

Happiness Meter: To become the happiest city on earth, Smart Dubai has instituted a powerful tool - the Happiness Meter, to measure city experiences from around 4 000 touchpoints. The Happiness Meter provides the city's leadership and administration with real-time access to happiness results, creating transparency and an immediate feedback tool.

Type

Smart Dubai impacts on all three building blocks of innovation: innovation dynamics, innovation capacity and ICT innovation in key sectors.

Goal(s)

Smart Dubai is the government office charged with facilitating Dubai's citywide smart transformation, to empower, deliver and promote an efficient, seamless, safe and impactful city experience for residents and visitors. The smart-city strategy Smart Dubai 2021 launched in 2017 entails six dimensions: living, governance, environment, economy, mobility and people.

Smart Dubai plays host to a number of emerging technology-backed applications powering the everyday lives of residents and visitors in the city. These include Dubai Now, Dubai Data, Dubai Careers, Smart Employee, Happiness Meter, Dubai Pulse and many others. Dubai Pulse forms the new digital backbone as the city platform built by means of a public-private-partnership. Dubai Paperless (2018) aims to digitize 100 per cent of government services by 2021, with no paper being used for internal or external transactions, thereby saving USD 350 million annually. Dubai Blockchain Strategy intends to make Dubai the first city government to run all applicable transactions on blockchain by 2020, involving an initial 20 well-defined public- and private-sector use cases and an implementation roadmap, both of which benefit significantly from third-party elimination, transaction ledgers, smart controls and/or automation.

Target stakeholders

Collaborating with private-sector and government partners, Smart Dubai services are offered to government and private-sector entities, as well as to residents and to visitors to Dubai. The Partners Portal is a one-stop-shop for more than 80 Smart Dubai services.

More than 50 entities: Today, more than 90 per cent of all Dubai government employees and more than 95 per cent of Dubai government budgets are managed by this single shared system.

Dubai city experiences directly impact and touch the daily lives of people, in areas such as starting a business, commuting, driving, renting or buying property, travelling to Dubai and enrolling in schools. Redesigned city experiences affect the lives of individuals, businesses and visitors in Dubai.

Governance

Smart Dubai is anchored in the vision of HH Sheikh Mohammed Bin Rashid Al Maktoum, Vice-President and Prime Minister of the United Arab Emirates, and Ruler of Dubai, and thus directly funded and managed by the government. It is governed by the following laws:

- [Law No. \(30\) of 2015 - Establishing the Smart Dubai Government Establishment;](#)
- [Law No. \(2\) of 2016 - Establishing the Dubai Data Establishment;](#)
- [Law No. \(1\) of 2020 - Renaming of the Smart Dubai Office to Smart Dubai Department;](#)

- [Law No. \(2\) of 2020 – Amending Law No. \(2\) of 2016 Establishing the Dubai Data Establishment.](#)

Resources and partners

Collaborating with government and private-sector partners, Smart Dubai is constantly adopting the latest technological innovations. Since its inception, Smart Dubai has launched over 130 initiatives in partnership with the government and the private sector, including, among others: Dubai Data Initiative, Dubai Blockchain Strategy, Happiness Agenda, Dubai AI Roadmap, Dubai Paperless Strategy, Start-up Support. The aim of the latter, for instance, is to transform the United Arab Emirates into the new testbed for start-ups and entrepreneurs.

Activities and events

Activities:

Smart Dubai has launched and continues to operate a number of programmes. These include, *inter alia*:

- *Global Blockchain Challenge*: Over the past two years, Smart Dubai has been hosting the Global Blockchain Challenge, inviting blockchain start-ups from across the globe to pitch their latest blockchain innovations which can be potentially implemented in Dubai.
- *Dubai Smart City Accelerator*: This is the leading accelerator supporting innovative companies in IoT and connectivity, urban automation and mobility, artificial intelligence, blockchain, open city data, sustainable cities and living, smart government, and the smart retail industry.
- *Dubai Future Accelerators (DFA)*: DFA is an intensive nine-week programme pairing the world's most exciting technology companies with leading government organizations to create transformational solutions.

Events:

Smart Dubai is host to numerous events, some examples of which are:

- Smart Dubai, in partnership with eight Dubai government entities, showcased Dubai's latest smart services and initiatives, launched in an effort to make Dubai the happiest and smartest city on earth, at the *Smart City Expo World Congress* in 2019.
- The *Future Blockchain Summit*, the world's largest blockchain festival, to be hosted by Smart Dubai, is planned in 2021 (postponed due to COVID-19).
- In line with the Dubai Blockchain Strategy 2020, Smart Dubai Office along with Dubai Future Accelerators hosted the *Smart Dubai Global Blockchain Challenge 2019*.

Impact on the entrepreneurial life cycle

Smart Dubai has instilled good practices in **entrepreneurial interest, engaging with problems, entrepreneurial events, success stories, incubators and accelerators, soft-skills training, skills training programmes, human capital, expansion, building collaboration** and **vision and strategy**.

B.11 Syria Digital Lab (SDL) (Syrian Arab Republic)

Overview

The Syrian Arab Republic's [Syria Digital Lab](#) (SDL) brings together talented Syrian tech developers and entrepreneurs from around the world and links them with donors, civil-society organizations and the private sector in a collaborative effort to help solve some of the country's most pressing challenges.

Syria Digital Lab aims to explore the digital space – its opportunities, risks and potential – in order to create an effective digital ecosystem that identifies, connects, incubates, accelerates and sustains Syrian-led digital initiatives.

Type

SDL impacts on two building blocks of innovation: innovation capacity and ICT innovation in key sectors.

Goal(s)

The main goals of SDL are:

- Identifying, connecting and supporting Syrian tech innovators and entrepreneurs
- Creating job opportunities for Syrian youth through training and mentorship
- Empowering civil society and supporting reconciliation and peacebuilding efforts
- Supporting policy thinking on an integrated digital agenda for the Syrian Arab Republic through research, advocacy and networking.

Target stakeholders

SDL promotes a big-tent approach to the digital space by encouraging collaboration across sectors, greater networking and public-private partnerships. It addresses the importance of tech social enterprises, which combine the strengths of civil-society organizations and the private sector in order to contribute to socio-economic growth. The focus is on stabilizing the impact of tech entrepreneurship, as improving the digital skills of Syrian youth can guarantee that they will be able to contribute to the growth of their country after the end of the current conflict.

Governance

SDL was established in 2018 by two co-founders – Malik Al-Abdeh and Rama Chakaki – as a solution to help people build up their lives after many years of conflict. With the aim of creating an effective digital ecosystem, SDL identifies, connects, incubates, accelerates and sustains Syrian-led digital initiatives. With a typical flat start-up structure, the co-founders bring their experience in the start-up, angel-investment and venture-capital worlds to develop and grow the SDL initiative. They are supported by a small team of seven members.

Resources and partners

SDL calls on community members in the Syrian Arab Republic, host countries or across the wider diaspora with the means to amplify its message. Specifically, these partners help SDL in identifying judges, securing investors and working with policy-makers to facilitate the work it accomplishes. SDL appreciates interest from community organizations, civil-society entities, venture-capital firms and individuals looking to make a difference and support mission-driven, Syrian-led digital initiatives.

Technology partners like software or hardware tech enterprises give SDL entrepreneurs access to their products, services or team mentorship. They also partner with individual consultants and mentors to guide entrepreneurs as they build and implement their digital solutions.

Key to the success of Syrian entrepreneurs is training and mentorship. Having got new community members on board, SDL offers individual mentorship, incubation, acceleration and training through its ecosystem training partners. Examples of how these partners can get involved include: hosting webinars, guiding entrepreneurs through their business development journeys, educating them on effective market research, teaching project management and even holding presentation training workshops.

Through its partners, the Syrian International Business Association (SIBA), VIP.Fund (Very Important Projects Fund) and Syria Youth Assembly, SDL offers competition finalists access to a large network of investors, counsellors, mentors and marketers. These individuals and organizations offer support depending on the needs of the organizations, and regardless of age or stage.

Activities and events

SDL is seeking solutions from Syrian tech innovators and entrepreneurs to address key challenges facing Syrians, inside the country and in the diaspora. In 2019, SDL conducted its first start-up competition, which invited applications from entrepreneurs who are building digital solutions addressing the Syrian community's education, healthcare and youth-engagement challenges. A team of judges selected finalists who presented their solutions to donors and investors from the Syria Digital Lab ecosystem.

Teams with winning solutions are receiving support from the SDL community through mentorship, access to technical support, prizes and seed funding. SDL organizes regular series of events: Challenge launches, Angel Investment Engagement, Investor Pitch Event.

Achievements

Funding was obtained from the EU and Germany's GIZ in 2019 to develop a global community of Syrian tech entrepreneurs, identifying more Syrian mentors and role models. Through this initiative, SDL provides greater capacity for peacebuilders and cross-sectoral organizations, supports enhanced data-driven policy and programming and lays the foundations for a digital economy in the Syrian Arab Republic.

In their first year of existence, tech entrepreneurs presented digital start-ups addressing conflict-related challenges in the Syrian Arab Republic and beyond. Through their presentations, they underlined the need for strategic investment and guidance in start-up initiatives as a key approach to unveil the potential of digital entrepreneurship.

Successful digital start-ups in the realm of technology, science, art and education like ShopGo, Maps for Syria, Hala Systems or Arageek, an award winner and now one of the most visited Arabic content publishing platforms, have been supported by SDL.

Impact on the entrepreneurial life cycle

Syria Digital Lab has instilled good practices in **building collaboration, seed funding, angel investment, soft-skills training, entrepreneurial events** and **entrepreneur community**.

B.12 World Innovation Summit for Education (WISE) (Qatar)

Overview

Qatar's [World Innovation Summit for Education](#) (WISE) was established by Qatar Foundation (QF) in 2009 under the patronage of its chair, HH Sheikha Mozah bint Nasser Al Missned. With a biennial summit held in Doha, and a range of year-round initiatives, WISE's mission revolves around promoting new approaches to education and investigating new ways to address pressing global education challenges.

WISE is a response to the need to revitalize education and provide a global platform for the development of new ideas and solutions. Since 2009, WISE has evolved into a thriving global, multisectoral community, which continues to generate fruitful dialogue and productive partnerships.

Type

WISE impacts on innovation capacity and ICT innovation in key sectors.

Goal(s)

WISE is an international initiative aimed at transforming education through innovation.

Target stakeholders

The WISE team endeavours to contribute to the creation of a global ecosystem for education that could help achieve the Sustainable Development Goal (SDG) on quality and inclusive education for all (SDG4), a component of the UN 2030 Agenda for Sustainable Development. To that end, it aligns with international organizations such as the United Nations and other key education stakeholders attending the Summit such as, among others, Teach for All, Brookings Institution, Asia Society, Boston Consulting Group, Results for Development, J-PAL, Bill and Melinda Gates Foundation, Save the Children, UNICEF and World Bank.

Governance

WISE operates under the umbrella of the Qatar Foundation - which is a non-profit organization made up of more than 50 entities working in education, research and community development - supported by the Government of Qatar.

It is run by a CEO, supported by a Director of Research and Content Development, a Director of Programmes and Content and a Director of Policy Development and Partnerships. A team of 13 other members contributes to making the organization operational.

Resources and partners

Diverse international corporate sponsors of WISE recognize that education is among the most effective long-term investments a nation can make in its economic and social development. The WISE sponsorship programme allows the private sector to contribute to education and to help prepare the next generation of leaders for new challenges. Key partners include, *inter alia*, Santander Bank, Exxon Mobile and Supreme Committee for Delivery and Legacy.

Activities and events

The WISE Prize for Education recognizes an individual or a team for an outstanding contribution to education at any level. The WISE Prize laureate is announced at the Opening Plenary Session of the global biennial Summit, and receives the WISE Prize for Education medal and USD 500 000 cash fund dedicated to growing their initiative.

Other activities organized by the WISE initiative are:

WISE Research: Research reports bring key topics to the forefront of the global education debate, and reflect the priorities of the Qatar National Research Strategy. The reports are produced in collaboration with recognized experts and organizations from around the world.

WISE Books: These are aimed at supporting innovative thinking in education. WISE Book authors and photographers travel to several countries in an attempt to identify the challenges and illustrate the impact of initiatives and practices that are making tangible differences – for example, “*Learning (Re)imagined: How the Connected Society is Transforming Learning*” focuses on the link between technology and education. The latest e-book in 2020, “*Education Disrupted, Education Reimagined – Responses from education’s frontline during the COVID-19 pandemic and beyond*” aims at providing the education community with a reference point for the crisis from which future research, policy and innovation can grow.

WISE Learners’ Voice: Learners’ Voice, inaugurated in 2010, is a programme that aims to reshape students’ perception of education. Each year, a selected group of young people, aged 18 to 25, participate at the annual Summit by engaging in debates and making presentations. Workshop sessions are also held throughout the year.

WISE Accelerator: The Accelerator is a support and advisory programme with the aim of developing early-stage projects in education. The programme, founded in 2014, seeks to assist projects that possess high potential for scalability and positive impact on the field of education. The programme selects five innovative projects from a variety of countries every year.

Achievements

WISE brings together over 1 500 experts, researchers and innovators from multiple sectors worldwide to foster new collaborations and develop solutions with the goal of inspiring creative changes in education.

The WISE community has established a network of education stakeholders – from students to decision-makers – from some 200 countries who share ideas and collaborate to seek creative solutions for solving challenges facing education.

Impact on the entrepreneurial life cycle

World Innovation Summit for Education (WISE) has instilled good practices in **basic research, soft-skills training, entrepreneurial interest, entrepreneur community, engaging with problems, building collaboration** and **human capital**.

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