Middle East and North Africa

Nagla Rizk, Nancy Salem, and Stefanie Felsberger

Key points

- The Middle East and North Africa has seen varied progress on open data, from university-led efforts focusing on social issues to government-led open data initiatives that place an emphasis on economic development.

- The region faces the substantial challenge of data scarcity: with gaps in data collection, data publication, and a lack of continuity and updates when data is released publicly.

- Improved regional networking is needed to unite the scattered initiatives that are working directly on open data and to ensure other data-literacy and capacity-building initiatives address openness, as well as more general data skills and use.

Introduction

The Middle East and North Africa (MENA) is an expansive geographical region that extends from Morocco in the West to Iran in the East. The region is historically, economically, and socially diverse. Arabic is the most widely spoken language with several subregional dialects. As a whole, the region is resource rich, with several economies primarily based on the exportation of natural resources, oil and gas in particular. A history of colonialism and imperialism has contributed to persisting socioeconomic challenges. Large populations of young, educated citizens are common to many countries in the region, providing a key asset to increasingly digital economies.

For the past decade, MENA has been broadly associated with civil unrest. Political and social change has been unpredictable, and, in many places, tensions persist. As in much of the world, the region has also had to grapple with technological change, which has created opportunities for both governments and citizens. Data has been at the forefront of many discussions related to these issues, including the potential for open data to address socioeconomic challenges.

This chapter provides an overview of recent developments in the field of open data in the region, stressing the diversity of open data initiatives undertaken and recording the key moments over the past few years. By extending the data life cycle approach, the chapter seeks to investigate not just the spectrum of data production, access, and use, but also to consider feedback mechanisms that ensure datasets remain timely and accurate. This allows for the integration of a broader set of issues in relation to open data, particularly the ability to use data once it is open. In the MENA context, where datasets are often scarce, it is critical to address what happens when data is published to fill an identified need but is never updated or is inaccurate. The chapter will also focus on a recent surge in capacity-building initiatives and their ability to address challenges to open data in the region.

Data-driven innovation: Framing the open data debate

Regional interest in open data has often been encouraged by international engagement with a global open data community where an increasing number of governments are adopting open data commitments as a result of the expansion of international networks and programmes looking at "data for development" initiatives, as well as the influence of narratives highlighting the economic potential of data. Resulting activities have overlapped and coalesced, with no clear chronology that would confirm which of these factors is the most important in pushing forward engagement with open data in the region. However, as a result, open data initiatives in the region are often explained by these three narratives: the socioeconomic potential of data to spur innovation and entrepreneurship; the potential of data for better decision-making, efficiency, and service delivery; and data for development. In addition, many initiatives and activities have been framed within the concept of data-driven innovation (DDI).

According to an Organisation for Economic Co-operation and Development (OECD) report on Data Driven Innovation for Growth and Well-Being,[1] DDI refers to innovation, new knowledge, products, processes, and markets created based on insights gained through the analysis of large volumes of data using new data analysis technologies, such as big data analysis, machine learning, and algorithms. The concept of DDI has been adopted within many of the initiatives explored in this section, irrespective of the sector or actor from which they originate.

The focus on DDI is also partly explained by regional development priorities. MENA has a large young population. The median age in the region is 22 years, compared to a global average of 28.[2] Educational enrolment rates are generally high across the region, but youth unemployment is a concern in most countries. Internet and mobile phone usage is common among the young and educated, and an emphasis on educational and employment reform has largely focused on building digital skills. Many countries have established national digitalisation plans or strategies, looking to capitalise on skilled youth and technological innovations to address socioeconomic challenges. This focus on DDI and the potential of the MENA region's youth are accompanied by a strong emphasis on the importance of entrepreneurial activities to develop the region. MENA is witnessing a growing interest in innovation originating from university campuses, accelerators, and incubators, resulting in the creation of networks and hubs for entrepreneurship.

There are two main emerging open data trends in the region. While some countries have seen work on open data led by governments within e-government or open government initiatives,

other countries have seen strong support for open data work come from universities and the private sector. While these two trends do not negate one another, very few countries have seen matched progress in both arenas.

Open and e-government: Digitalisation from the top down

Open government data is often an element of larger national digitalisation strategies. This is particularly true for countries in the Gulf Cooperation Council, which have linked the development of e-government services with open data initiatives. The United Arab Emirates (UAE), for example, has an open data portal (Bayanat.ae) that is framed in terms of their vision of promoting a digital knowledge economy.[3] Since data and data-driven decision-making are key drivers fuelling the knowledge economy, the open data movement is seen more as part of initiatives that encourage overall digital transformation strategies and projects.

Qatar's open data policy also follows the country's digitalisation initiative. As part of this policy (published in November 2014), Qatar's e-government portal, Hukoomi, makes several open datasets available.[4] Bahrain also has an open data portal, allowing users to select data by topic with an option to bulk download several datasets at once.[5] Oman's e-government service portal currently has 56 open datasets across 12 different sectors available in csv (comma-separated values) format.[6] Additionally, Oman has an Omani Open Government License with stipulations for the use of government data.[7]

Much like the region's Gulf states, Lebanon has also sought to incorporate open data into its national digital transformation strategy. In March 2018, Lebanon held a Digital Transformation Summit to highlight plans for digital government services, open data and evidence-based policies, cybersecurity, and capacity building. Their e-government portal was launched at the conference although it is still in beta phase.[8]

Other notable initiatives have stemmed from engagement with the Open Government Partnership (OGP). Three countries in the region are now members: Jordan, Morocco, and Tunisia. Since joining the OGP in 2014, Tunisia has made 20 commitments, with an additional 15 currently underway. The country's current national plan supports a range of OGP principles with initiatives falling within such thematic areas as e-government, legislation and regulation, and public service delivery. As part of these efforts, Tunisia's Ministry of Energy worked with international organisations in 2014 to implement a site for publishing hydrocarbon investment contracts along with their associated documents.[9] This followed appeals to increase transparency around projects related to the extractive industry. The data is available in machine-readable formats and is accompanied by metadata that includes country, company name, resource being extracted, signature date, and type of contract.[10]

Innovation from universities and the private sector

A focus only on public sector data and national open data initiatives can conceal critical work from universities and the private sector in the region in both using and creating relevant datasets. Although working with different datasets and areas of focus, their initiatives often still lie within a DDI framework, emphasising the potential of data-related projects to create employment through entrepreneurship.

In 2015, a research consortium led by the Access to Knowledge for Development (A2K4D) Center at the American University in Cairo, with Al-Akhawayn University in Morocco and the Center for Continuing Education at Birzeit University in Palestine, developed several pilot data and open data initiatives in the region with support from the International Development Research Centre (IDRC). Within this consortium, A2K4D in partnership with SETS North Africa used open-sourced, crowdsourced, and existing government data to capture informal transport patterns on Cairo's Ring Road (the largest freeway in Greater Cairo which connects large portions of the city's metropolitan areas) to visualise information on transport safety, accessibility, and reliability.[11] A2K4D also developed a pilot Solar Data Platform in partnership with IDRC and the German Friedrich Ebert Stiftung, providing a repository where users could openly share data on energy projects in Egypt.[12] The project places particular emphasis on the use of data to connect different business actors (distributors, installers, and suppliers) in the supply chain for solar energy projects and to create sustainable entrepreneurial networks.[13] As part of the same consortium, Birzeit University used sensors to measure air pollution in Ramallah and then trained the Ministry of Transportation on the uses of data-based technologies to monitor air quality.[14] Al-Akhawayn University also created a digital tool to crowdsource data on accident-prone highway locations.[15]

Beyond this consortium, the Open Data Impact Map, developed and managed by the Center for Open Data Enterprise in the United States (US), has documented a further seven initiatives in the region using open data.[16] The Impact Map lists two data initiatives in Lebanon: Visualising Impact from an organisation founded in Canada, with a regional office in Beirut, that combines storytelling with data visualisation[17] and the Lebanese Elections Data Analysis which monitors Lebanese elections.[18] In Egypt, Transport for Cairo (TfC), a product created in 2015 by a cross-disciplinary team of urban planners, social scientists, and computer engineers, has mapped traffic networks in Cairo using an open data methodology also employed in Kenya and London.[19] The project has sought to explore how transit mapping can contribute toward urban mobility by exploring the availability of data from private transport firms on transport affordability, safety, and environmental sustainability alongside more commonly sought transit data such as service timetables and real-time locations.[20]

Larger private sector organisations have also made efforts to release their data with varying levels of detail and openness. For example, Uber launched an open data platform called Uber Movement in 2017[21] and recently made aggregated data on its vehicle movements available for bulk download. Cairo is currently the only city in the MENA region with data available on the Uber Movement platform, but initiatives like this are set to be a valuable source of data that is not available elsewhere. The private sector may also have the capacity to be an important source of data when other parties lack the necessary resources and opportunities. A growth in private sector data provision should, however, be accompanied by a concern for user privacy and data ownership.

The growing diversity of open data and DDI initiatives reflects differing objectives and capacities to create and use open data. As discussed at greater length later in this chapter, the ability to engage meaningfully with open data can render initiatives less supply-side driven and more responsive to open data demand. It is also important to note that while acknowledging the potential of open data for new economic opportunities for small and medium enterprises, a focus

on DDI does not necessarily involve advocacy for fully open data. Nevertheless, focusing on the economic potential of open data, as DDI has undoubtedly had an effect on the open data agenda in the region, and using DDI as a common starting point, can serve to spark a dialogue across stakeholders that may not initially be interested in open data.

The challenges: Data scarcity, engagement, and capacity

To further develop both DDI and parallel open data work in the MENA region, there are a number of challenges that will need to be addressed. In overcoming these challenges, there are genuine opportunities to deploy data as a tool for social and economic development.

Data scarcity

In the MENA region, data has remained scarce for varying reasons, but data collection issues are key.[22] Therefore, in discussing data scarcity, it is important to explore two main issues: data openness and the ecosystem around data collection, production, and management. Three questions are relevant: whether data is open?, whether good quality and timely data has been collected?, and whether it will continue to be collected and released? Data scarcity appears to be a common issue across the region, albeit to varying degrees and for different reasons; however, the common objective throughout the region, using data in order to support the development of the digital knowledge economy, has undoubtedly shaped decisions that affect data availability and quality.

Using Open Data Barometer data from 2015,[23] data expert Hatem Ben Yacoub estimates that only 1.48% of data in the Arab world is open. Even though the Barometer indicated that 71% of surveyed government information was available on the internet, there were technical and/or legal barriers to accessing it as machine-readable data. The Barometer data also indicated that readiness for open data development in the Arab world was lower than the global average at 32.44% and implementation rates stood at just 16%. Other measurements indicate issues not only with the quality of open data, but also with the breadth of data that is made open, although some concerns about methodology have been expressed.[24]

Initiatives like the Global Open Data Index (GODI), managed by Open Knowledge International (OKI), use crowdsourced assessments, depending on the availability of local contributors found through referrals and social media. Exploring the GODI[25] measurement of open government data in 17 countries, Riyadh Balushi and Sadeek Hasna note that a common challenge is that several governments store and publish data and records as scanned PDF documents under varying licences that affect how "open" the records can be considered.[26] Table 1 draws on the GODI and illustrates the varied progress made by countries across a range of data categories, highlighting that, in the region, there remains much room for progress on several datasets. This data was also used to prepare Figure 1.

Table 1:   Open data progress in the MENA region
Source: Global Open Data Index (https://index.okfn.org/)[27]

Country	National Statistics	Legislation	Procurement tenders	Pollutant emissions	Company register	Location datasets	Water quality
Algeria	35%	35%	0%	0%	0%	0%	0%
Bahrain	80%	45%	35%	10%	45%	0%	5%
Egypt	60%	45%	0%	0%	0%	0%	0%
Iran	0%	45%	0%	0%	0%	0%	5%
Iraq	50%	45%	0%	0%	0%	0%	0%
Jordan	35%	0%	45%	0%	35%	0%	10%
Kuwait	35%	25%	45%	10%	0%	5%	0%
Lebanon	35%	45%	0%	45%	35%	0%	0%
Libya	35%	45%	0%	0%	0%	0%	0%
Morocco	35%	45%	45%	0%	15%	100%	35%
Oman	80%	75%	45%	0%	0%	0%	0%
Qatar	35%	90%	45%	35%	0%	0%	0%
Saudi Arabia	50%	45%	35%	5%	0%	0%	0%
Sudan	0%	45%	0%	0%	0%	0%	0%
Syria	0%	5%	0%	0%	20%	0%	0%
Tunisia	90%	45%	0%	5%	0%	25%	0%
United Arab Emirates	60%	35%	0%	45%	0%	0%	0%

These findings are echoed by the 2017 Open Data Inventory (ODIN), which assessed data available on National Statistical Office (NSO) websites for both coverage and openness.[28] Prepared by Open Data Watch, the inventory also offers a two-year comparison between data available from 2015 to 2017.[29] Figure 1 represents the overall ODIN score of countries in the MENA region. Findings from this assessment indicate that there is progress to be made in terms of openness, with the highest overall percentage of statistical data available as open data being 51% in the UAE. The relative openness of the region as a whole, according to ODIN, based on an accumulation of social, economic, and environmental statistics, has remained stable since the 2015 report, although Egypt's overall performance has gone up by 3 points from 2015 to 2017, while Jordan's has gone down by 1 point.

Given these findings, focus in the regional open data community has understandably been placed on releasing more open data. For the region as a whole, there is also a concern around the lack of feedback mechanisms to ensure that open data is timely and responds to the demands of users. The 2017 *Open Data Barometer, 4th Edition* found that almost all countries in MENA were regressing on open data progress made in previous years, citing, in particular, a lack of civil society engagement.[30]

Further insight into regional data scarcity is gained by looking beyond static measures of data availability to examine what happens before and after data is released. This involves placing a focus on the data life cycle, including data production, access, and use, and determining what data is produced; who has the skills, knowledge, and the financial and technological capacity to access and work with data; and how the data is used. Another important issue is the question of how long a dataset can be used before it becomes untimely or inaccurate.[31]
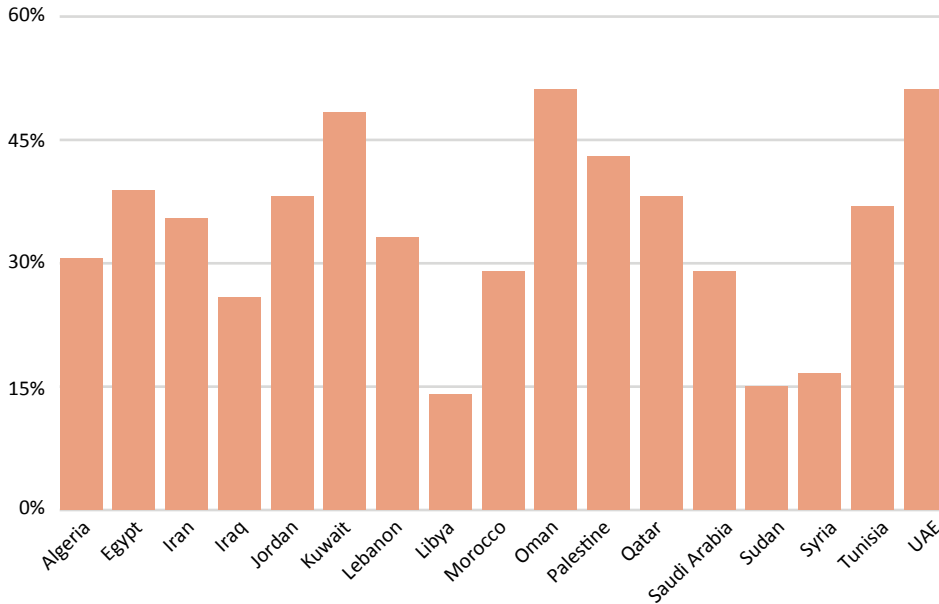
Figure 1:   Open Data Inventory score of MENA countries[32]

When only limited datasets are available, they are often used far beyond their timeliness and accuracy, with the lag between data collection and use having a detrimental impact on the practical results of data analysis. What is missing in most data initiatives are feedback mechanisms about the status of datasets after their release to ascertain that they remain timely, accurate, and useful, as well as to determine whether inaccurate datasets should be updated or retracted.

Looking at current indices measuring openness, the main focus is placed on the number of priority datasets released. There is less effort, however, applied to measuring the number of datasets used by relevant stakeholders or to exploring how existing and released datasets are updated and managed. This can hide elements of scarcity in practice. When focused more on the demand-side of data, it is possible to identify gaps in how stakeholders engage in the opening up of data, the lack of feedback mechanisms supporting potential users in requesting certain datasets, or the inability to assess what data is required or requested by different stakeholders.

Data engagement and uptake has been difficult globally, and, in the early years of open data, most efforts around the world were placed on releasing data without focusing on data uptake strategies. In the case of MENA, addressing data scarcity involves encouraging new actors to take on open data initiatives, particularly in academia, which occupies a key role in the use of data for research, and advocating for more reliable, high quality, and timely data.

Engagement and uptake

Despite issues surrounding data scarcity, many local and international organisations have supported a degree of engagement with open data in the region, both through funding and development programmes. Engagement with open data, in particular as part of data-driven innovation, has been encouraged most clearly through community-building activities. Notably, this community building has looked to engage stakeholders working in the wider fields of open-source software, open knowledge, digital innovation, and development.

The role that international networks have played in setting a global agenda around open data should be highlighted. Both the Open Data Institute (ODI) and OKI have promoted open data, data use, and the issue of data standards around the world. Established network members or nodes in the region between 2013 and 2015 include the ODI in Cairo, Dubai, and Riyadh, and the OKI in Egypt and Morocco (although these appear to now be inactive and are recorded as "hibernated").[33] When active, both ODI and OKI provided a mix of open data workshops, skills training, and events that showcased the different uses of open data in contributing to innovation and development.

Code for Africa (CfA) is a continent-wide network that fosters the use of open data to solve the real-life problems of citizens. CfA places an emphasis on the importance of a thriving open data ecosystem in the region and has developed various projects to further this vision. A great example of this type of initiative is openAFRICA, the continent's largest open data repository. Although the project is focused on Sub-Saharan Africa, the network has members from Arab countries and has a hub in Morocco, Code for Morocco (CfM). Working within the mandate of CfA, CfM focuses on digital innovation and fostering data ecosystems at the local level.

A key turning point for the open data movement and community building in the region came in February 2016, when a week-long regional conference titled "Data Driven Innovation (DDI) MENA" was held in Cairo, hosted by IDRC with Cairo University, the Canadian Embassy in Cairo, United Nations Development Programme (UNDP), Information Technology Institute (ITI), and the International Labour Office (ILO).[34] Several days of events culminating in a two-day workshop at Cairo University focused on the status of DDI and digital entrepreneurship.

A central theme running through DDI Week in Cairo was the use of open data in relation to the Sustainable Development Goals (SDGs) and the potential for open data to facilitate information sharing within and between the public sector and private sector. Speakers also emphasised the potential for open data to be a critical resource for digital and social entrepreneurs. This was seen to be especially important in the MENA region which, as has been noted above, has a significant younger population with high rates of mobile phone and digital media use.

In December 2016, the first MENA node of the global OD4D network was established in the region.[35] MENAData has hosted regional events as part of its work and aims to build capacity for a locally based open data community. Through its collaboration with a number of stakeholders in the region, spanning across Algeria, Egypt, Lebanon, Morocco, Tunisia, and Palestine, the node aims to contribute to building the supply of quality open data in the region, advancing locally driven solutions, and promoting a sustainable open data ecosystem.

The 2016 DDI Week and the subsequent ongoing activities of MENAData have focused on bringing individual initiatives together into a more coordinated and cohesive network. Recognising local nuances, the establishment of mechanisms for stakeholders to share resources and best practices is important. These mechanisms may also help to address the lack of demand-side inclusion in open data if they furnish outlets that aid in the identification of gaps in current data provision. They also help to document progress on the use of data in the region. Continuation of this networking and community building remains a central priority for the region. While the past few years have looked to involve new stakeholders in open data activities, the next few should focus on consolidation, capitalisation, and investment in the networks developed to date and ongoing knowledge and capacity building.

What is evident in the most recent phase of engagement across the region is the emphasis on innovation and data for development. This focus ties in well with the development of digital transformation strategies and e-government portals built by governments as they look to capitalise on the digital economy. The DDI emphasis also links with an emphasis on data innovation in tackling growing unemployment in the region, a priority for the development agendas of many countries. In total, this has meant that some degree of stakeholder buy-in with open data has been achievable, even though it has not followed the discourse on open data for accountability that other regions have stressed. It is nonetheless clear that open data is being used for a host of activities beyond innovation, and it is premature to assess the impact that adopting the framing of DDI will have in the long term. Regardless, turning engagement into impact will also require a continued emphasis on building the capacity of users to work with data critically.

Who are the funders?

Several organisations have begun to offer support and funding to data projects in the region:

- IDRC, through the OD4D network, supports a multitude of open data activities in the region, including the Open Data for Development MENA (MENAData) node and the DDI Cairo week.

- The World Bank has provided technical assistance to governments with open data strategies and implementation, open budget data, and making the case for open data. It also offers support and grants to initiatives that use open data to address developmental challenges.

- UNICEF's Innovation Fund gives money to startups using frontier technologies, such as AI or blockchain, that have the potential to reach a very large number of children. One of their requirements is that the funded output has to be open source.[36]

- The UNDP's Innovation for Development programme has also supported the potential of big data solutions for development in the region, launching an Innovation for Development Lab in 2014.[37]

Capacity building

The sections above have identified barriers that go beyond questions of access, looking past the lifecycle of datasets to understand the impact of data in context. Ultimately, limited regional availability of data has led to the overuse of particular datasets, and widely circulated datasets are used beyond their contexts and "expiry dates". In addition, insufficient training of parties in implementing data collection processes has often meant that stakeholders do not feel included in the processes and do not trust that their privacy is being respected.[38] This suggests capacity building is not just about the development of technical data skills, but also about assisting stakeholders to adopt more critical perspectives on data. Additionally, cheaper and more accessible digital technologies have eased the collection of datasets, often creating varied representations of the same phenomenon.

Research conducted by the Centre for Continuing Education (CCE) at Birzeit University (BZU) has pointed out some critical issues with general data capacities in the region.[39] The CCE finds that wide community awareness and engagement has been limited. Specific data science courses outside of business contexts are also scarce. In an effort to combat the widening gap between data knowledge and capacity, the CCE has developed curricula and educational modules aimed at building data skills and capacities among students and professionals. Researchers at BZU have found, in particular, that there is a substantial shortage in local capacity and knowledge pertaining to the use of data with regard to decision-making and policy development.[40] Citing the lack of general awareness about the potential that data has as a key driver of economic development and service delivery, the university has developed three educational modules in Data Science.

The modules were developed with the local context in mind to provide students with both practical and theoretical tools that can be used to enhance capacity and knowledge in the region. Further to the university-level courses, BZU has also worked toward implementing a programme for school students that integrates data literacy into the existent curricula. In developing and executing educational modules, the university hopes to strengthen awareness and knowledge about the role that data plays in supporting development and advocacy in the region. By adopting an Open Educational Resource (OER) approach, teaching materials have also been made openly available through Github (Data Science Fundamentals[41] and Applied Data Science[42]) so that the modules developed can be taught at other universities in the region, including Al-Najah National University in Nablus.

In recent years, data capacity-building initiatives have also emerged in several other countries. While the focus has not always explicitly been on open data, progress toward data literacy and better awareness of the potential of data are arguably also important contributions toward the use of open data. Most activities place a focus on encouraging individuals to experiment with data and vary from short-term events to long-term initiatives that take the form of data hackathons or bootcamps. Many examples include an element of mentorship from data experts. More intensive initiatives, such as curriculum development or data labs, aim to make the use of data more common in learning. There has also been notable interest in the potential of data journalism and data visualisation in the region.[43]

One such activity was a regional hackathon led by the Arab Development Portal (ADP) in October 2017. The ADP is a knowledge depository and online database, which allows users to browse, download, and visualise data from across the Arab world.[44] Led by a number of institutional affiliates in the Arab region, the platform hosts a comprehensive database spanning 12 areas of development impacting Arab countries. It includes data gathered from the various countries' NSOs and international sources. Content on the platform is available in both Arabic and English, ensuring greater accessibility to individuals and communities in the region. The hackathon, entitled Visualize 2030, was carried out in partnership with the UNDP and centred around the UN's 17 SDGs.[45] Participants had the opportunity to attend seminars by data scientists and development practitioners in the field. In hosting this event, the ADP was able to further cultivate the open data ecosystem in the region and encourage young individuals to think critically about the potential data has for the region's inclusive growth and development.

Another initiative focused on data visualisation skills is Visualizing Impact. Under MENAData, Visualizing Impact hosted the Impact Data Lab in 2017, culminating in a four-day workshop in Amman, Jordan.[46] Dedicated to producing data visualisations for social justice in Palestine, participants received up to three months of mentorship with data experts prior to the workshop, which was held in collaboration with Columbia University Studio X Amman. While the workshop was multi-disciplinary, participants were predominantly data journalists, researchers, information designers, and web developers.

Building women's data skills in Egypt

A series of skills-building workshops were organised in 2016 and 2017 in Egypt, focusing on data visualisation skills and on building capacity for women. Two workshops were held in Cairo by Infotimes in collaboration with the Canadian Embassy in Egypt, A2K4D, and IDRC. The workshops included a Data4Women Hackathon that focused on tackling gender inequality through data visualisation. IDRC and the German Federal Enterprise for International Cooperation (GIZ) further supported data visualisation workshops in the Southern city of Aswan, in coordination with local non-profit foundation Om Habibah. These workshops focused on the economic empowerment of women.

It is clear that there is a breadth of capacity-building activity, ranging from work on basic data skills to work with a more explicit focus on economic empowerment or social justice. Data availability and engagement, as well as networking activities that can support shared learning, are the foundation for the regional advancement of open data.

Conclusion

This chapter has attempted to shed light on the current state of open data initiatives in the Middle East and North Africa, pointing to a regional diversity of open data initiatives. It has argued that predominant trends around open data can be seen as diverging efforts to respond to regional

interest in open data as a resource for innovation. Open government data initiatives have now taken root in many countries, often linked to digital government reforms, while non-governmental initiatives under a narrative of "data driven innovation" have also emerged. However, issues of data scarcity and limited user feedback indicate that there is still work to be done for these divergent trends to "meet in the middle". The chapter has also identified a number of the challenges that need to be addressed around engagement, uptake, and capacity building, although a range of examples have also revealed that some progress is being made on meeting these challenges across the region. Lastly, the chapter highlighted the need to manage open data throughout its life cycle, arguing that what happens to data after it is released needs to be part of how we evaluate the success of open data in the region.

Although many examples of open data supply, engagement, and use have been explored, in the future the MENA region will require a convergence of the efforts of stakeholders and stable open data networks to ensure the sustainability of initiatives and efforts to date. Broad-based capacity building will be central to further advancing open data, specifically initiatives that aim to build the data skills of people across all sectors. It is only by ensuring a diversity of users and data from the public and private sectors that the potential of open data will be realised. Sustainability and advancement could also be strengthened by working with a wider array of donors and investors and requiring increased effort on the part of local organisations to advocate for data-driven projects.

Further reading

Alanazi, J. & Chatfield, A. (2012). Sharing government-owned data with the public: A cross-country analysis of open data practice in the Middle East. *AMCIS 2012 Proceedings*, *16*. http://aisel.aisnet.org/amcis2012/proceedings/EGovernment/16

Elbadawi, I.A. (2012). The state of open government data in GCC countries. In *12th European Conference on EGovernment (ECEG 2012)*, pp. 193–200.

Web Foundation. (2017). *Open Data Barometer, 4th Edition – Regional Report for Middle East and North Africa*. Washington, DC: World Wide Web Foundation. https://opendatabarometer.org/4thedition/regional-snapshot/middle-east-north-africa/

About the authors

Nagla Rizk is Professor of Economics and Founding Director of the Access to Knowledge for Development Center (A2K4D) at the School of Business at the American University in Cairo.

Nancy Salem is a Senior Researcher at the Access to Knowledge for Development Center at the American University in Cairo.

Stefanie Felsberger is a Senior Researcher at the Access to Knowledge for Development Center at the American University in Cairo.

How to cite this chapter

Rizk, N., Salem, N., & Felsberger, S. (2019). Open data around the world: Middle East and North Africa. In T. Davies, S. Walker, M. Rubinstein, & F. Perini (Eds.), *The state of open data: Histories and horizons.* (pp. 503–516). Cape Town and Ottawa: African Minds and International Development Research Centre. http://stateofopendata.od4d.net

Endnotes

1   OECD. (2015). *Data-driven innovation: Big data for growth and well-Being*. Paris: OECD Publishing. https://dx.doi.org/10.1787/9789264229358-en

2   Youthpolicy.org. (n.d.) Middle East and North Africa: Youth facts. http://www.youthpolicy.org/mappings/regionalyouthscenes/mena/facts/

3   http://data.bayanat.ae/en_GB/dataset

4   http://portal.www.gov.qa/wps/portal/opendata

5   http://www.data.gov.bh/en/ODPolicy

6   http://www.oman.om/wps/portal/index/opendata/

7   Government of Oman. (n.d.). Open government licence – Oman. http://www.oman.om/wps/portal/index/opendata/ogl/

8   Lebanon Digital Government. (n.d.). Lebanon digital transformation. *Digital Transformation Conference 2018*. https://digitaltransformation.gov.lb/digital-conference/

9   Dreisbach, T. (2017). Information for the people: Tunisia embraces open government, 2011–2016. *Innovations for Successful Societies*. Princeton, NJ: Princeton University. https://successfulsocieties.princeton.edu/publications/information-people-tunisia-embraces-open-government

10 Heni, W. & Pedersen, A. (2016). Tunisians can now access hydrocarbon contracts in open data format. *Natural Resource Governance Institute*, 7 October. https://resourcegovernance.org/blog/tunisians-can-now-access-hydrocarbon-contracts-open-data-format

11 http://menadata.net/public/project/3

12 https://solardataegypt.info/

13 Access to Knowledge for Development Center. (n.d.). Open data in solar energy. Digitising dynamics: The solar energy sector in Egypt. *Access to Knowledge for Development* [Blog post]. http://a2k4d.tumblr.com/opendatainsolar

14 Marwan Tarazi (Director, Center for Continuing Education) in discussion with the authors.

15 Kettani, D. (2018). Enhancing road safety in the MENA region using a big data app. *Conference Proceedings: The Seventh International Conference on Advances in Computing, Electronics and Communication.* New York: SEEK Digital Library. https://www.seekdl.org/conferences/paper/details/9495.html

16 Middle East & North Africa. (n.d.). The Open Data Impact Map. http://opendataimpactmap.org/mna.html

17 https://visualizingimpact.org/

18 http://lebanonelectiondata.org/about.html

19 Transport for Cairo. (2019). Transport for Cairo: A simple map to travel through Cairo. http://transportforcairo.com/

20   Abdelaal, A., Hegazy, A., Hegazy, M., & Khalafallah, Y. (2017). *How can transport mapping contribute to achieving adequate urban mobility? The case of the Greater Cairo Region (GCR)*. Cairo: Takween Integrated Community Development and Transport for Cairo. http://transportforcairo.com/wp-content/uploads/2017/11/TfC_TICD_How-can-Transit-Mapping-Contribute-to-achieving-AUM-08-11-2017-Web-Version.compressed.pdf

21   Moon, M. (2017). Uber movement's traffic data is now available to the public. *Engadget*, 31 August. https://www.engadget.com/2017/08/31/uber-movement-traffic-data-website-launch/

22   Rizk, N., Felsberger, S., & Salem, N. (2017). Data for development in the MENA region: A narrative on paradigms, production, access and usability. Working Paper (Forthcoming). Cairo: MENA Data Platform, p. 53.

23   Web Foundation. (2015). *Open Data Barometer – Global report.* 2nd edition. Washington, DC: World Wide Web Foundation. https://opendatabarometer.org/assets/downloads/Open%20Data%20Barometer%20-%20Global%20Report%20-%202nd%20Edition%20-%20PRINT.pdf

24   Ben Yacoub, H. (2015). Why Open Knowledge's Global Open Data Index 2015 is a failure. http://www.hbyconsultancy.com/blog/why-okf-global-open-data-index-2015-is-a-failure.html

25   https://index.okfn.org/

26   Al-Balushi, R. & Hasna, S. (2016). *Open data in the Arab World: An examination of government data in the Arab world in the area of national budget, legislation, elections, and company register*. https://www.academia.edu/22800914/Report_on_Open_Data_in_the_Arab_World

27   The table was created by A2K4D using the Global Open Data Index.

28   Open Data Watch. (2017). *Open Data Inventory 2017 annual report: A progress report on open data*. Washington, DC: Open Data Watch. http://odin.opendatawatch.com/Downloads/otherFiles/ODIN-2017-Annual-Report.pdf

29   Open Data Inventory. (2019). Open Data Inventory 2018/2019. http://odin.opendatawatch.com/

30   Web Foundation. (2017.) *Open Data Barometer – Regional report for Middle East and North Africa*. 4th edition. Washington, DC: World Wide Web Foundation. https://opendatabarometer.org/4thedition/regional-snapshot/middle-east-north-africa/

31   Rizk, N., Felsberger, S., & Salem, N. (2017). Data for development in the MENA region: A narrative on paradigms, production, access and usability. Working Paper (Forthcoming). Cairo: MENA Data Platform, pp. 63–64.

32   The chart was created by A2K4D using the data from Table 1.

33   https://okfn.org/network/

34   http://www.eg.undp.org/content/egypt/en/home/presscenter/events/2016/february/big-data.html

35   http://od4d.net/about/

36   https://www.unicef.org/innovation/

37   http://www.eg.undp.org/content/egypt/en/home/ourwork/development-impact/overview.html

38   Rizk, N., Felsberger, S., & Salem, N. (2017). Data for development in the MENA region: A narrative on paradigms, production, access and usability. Working Paper (Forthcoming). Cairo: MENA Data Platform, pp. 53–55.

39   Birzeit University. (2019). Research and projects. https://www.birzeit.edu/en/research

40   Khooli, Abed A. (2016). *Curricula development and capacity building component: Background research*. Working Paper (Forthcoming). Birzeit, Palestine: Birzeit University.

41   Abdel-Razzak. (2017). Data science fundamentals. *GitHub* repository**.** https://github.com/Abdel-Razzak/DSF

42   Khooli, Abed. A. (2017). Applied data science (ADS 2). *Github* repository. https://github.com/abedkhooli/ds2

43   See https://infotimes.org/ and http://www.arabdevelopmentportal.com/viz2030

44   Arab Development Portal. (2019). About us. http://arabdevelopmentportal.com/node/6142

45   Arab Development Portal. (2017). Beirut hackathon – Visualize 2030: The first SDGs data dive camp in the Arab region. https://tinyurl.com/y7ww7vll

46   Impact Data Lab. (2019). Visualizing Palestine. https://visualizingpalestine.org/impact