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National Digital Economy Strategies: A Survey of Africa

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ABSTRACT Developing national digital strategies has become crucial for all countries, especially for developing nations. African countries, in particular, must find a niche in the global digital economy to accelerate inclusive social and economic development using technology. This brief compares the national digital strategies of 17 African countries and analyses them based on the typology of the relationship between state and society in the context of the innovation strategies of Western economies. The brief aims to find effective approaches to formulating digital strategies and contributes to the study of the process of national economic strategising in countries with market and partly-market economies.

INTRODUCTION

Across the globe, a new type of national strategic document is emerging, i.e. the national strategy for digital economy.[1] A comparative analysis of the strategies for digital economy of various countries, in the context of both economic development and political systems, can help in the following tasks:

- Describing the generalised digital economy agenda for developing countries; this will allow for an effective (re)formulation of future strategies.

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- Understanding the motives, goals, foundations, opportunities and limitations of the process of national economic strategising in countries with market or partly-market economy; this will provide important insights on the issues of private-public partnership for the sake of national economic development.

The development of internet-based digital technologies calls for a new type of national strategic document. Some scholars, such as Canazza[2] or Garrity,[3] note that the internet is a global public good, in certain aspects similar to the ocean or the atmosphere. Yet, the private actors that founded it continue to play the leading role in its development. While some countries have made efforts to introduce state-controlled actors into the digital ecosystem, their role has thus far been limited to the creation and maintenance of basic connectivity infrastructure.[4]

Another challenge for national digital strategising, especially in the context of developing economies, is the "digital gap." Internet and other digital technologies were developed mostly by American companies, and the environment is dominated by the English language. Today, the US actors continue to lead in most segments of the market, despite visible progress made by companies from other large economies such as China, Russia and India. Thus, a group of private actors from one part of the world have unprecedented access to information about other nations as well as to their economic space.[5] Popular internet platforms such as Google, Facebook and Twitter are hubs for business activities and important elements of the information environment of citizens across countries. An effective national digital strategy must address the cultural and ideological challenges of the decentralised information environment, largely defined by external private actors.

Some African countries have made remarkable achievements in the digital economy, e.g. the M-Pesa in Kenya, the world's largest mobile-money system.[6] In Africa, mobile communication is the most inclusive piece of infrastructure. In Chad,[7] for example, only four percent of the population has access to electricity, but 52 out of every 100 inhabitants have mobile-phone subscriptions.[8] Thus, the share of the mobile economy in the GDP of Sub-Saharan Africa is considerably higher than the world average, at 7.7 percent and 4.6 percent, respectively.[9] Overall, the continent has digital corporate giants such as Naspers in South Africa, which has a market capitalisation of over US$120 billion.[10] Ndemo and Weiss suggest an interesting general framework for the digital transformation of the continent,[11] stating that it needs "(a) enabling and impeding conditions of change; (b) actions and strategies for individual and collective change processes; and (c) translation of change across environments".

Currently, the continent faces several challenges in the digital space. First, Africa lacks resources to develop adequate infrastructure. Second, most African nations are too small as markets to nurture globally competitive players. Third, there is a strong unmet need for human resources with world-class digital skills. The situation calls for concerted efforts from both state and private actors. This will help overcome the deficit of resources and maximise the potential impact

of digital technology on socioeconomic development. According to R.P. Rumelt, a leading writer on strategy, "Good strategy is about focusing and coordinating efforts to achieve an outcome, which necessarily means saying 'No' to some goals, initiatives, and people."[12]

The following section analyses the national digital strategies of various African countries and compares them to those of West Asian countries.[13]

THEORETICAL FRAMEWORK AND METHOD OF ANALYSIS

The concept of "digital economy" was introduced in 1995 by Dan Tapscott, a business consultant. Since the early 2000s, it has been increasingly present in academic literature, and by now, there is a considerable body of research on the subject.[14,15] Yet, the need for a coordinated national effort to transition to a digital economy, i.e. national digital strategising, remains largely unexplored. The little research that has been done on the national strategies of cyber security[16] does not focus adequately on strategies and their development. For instance, Teoh and Mahmood have discussed the economic aspects of cyber security, but their point of focus is the technology platforms. Al-Khouri[17] as well as Bukht and Heeks[18] present interesting approaches to national digital transformation in the context of emerging markets, but their study does not dwell on the development of national strategies.

However, broadening the search from "digital economy" to "innovative economy" reveals a substantial body of valid research, conducted mostly by two groups of authors: Thomas Murtha and colleagues in the US[19] and Bengt-Ake Lundwall and fellows in Denmark.[20] Both groups apply the ideas of "economics of development" (e.g. Freeman's analysis of Japan's technological breakthrough in the 1970s[21]) and the "new theory of growth" (represented by Romer[22] or Aghion and Howitt[23]) to the development of government strategies to create innovative industries.

"To understand the construction of innovation systems it is, therefore, not sufficient to explore the endogenous institutional evolution of the private sector. The public sector plays a major role ... in at least two respects: enhancement of the production and distribution of technology and the reduction of transaction costs."[24] Lundwall et al. offer motives for the national strategies of innovative economies, which are fully applicable to the digital economy and can be summed up as overcoming various failures of the market.[25] They further note that since national businesses often seek government support, in countries with a developed public policy, the relevant discourse may become a competitive vehicle for politicians and political parties. This can be extended to digital economy: a proposed national strategy may have a hidden electoral agenda and can be used by the ruling party as an image-building instrument.

Murtha et al. applied Jepperson's classification of states—into social corporate, state corporate, liberal pluralist and state nation—to the analysis of the role of the state in the development of innovative industries in a group of advanced economies, including the US, Japan and a few countries of EU.

Using Murtha's framework to analyse the national strategies of the digital economy in Middle Eastern countries,[26] revealed a complex relationship between their political system and the focus of national strategising. The countries with active public politics and heated electoral battles, e.g. Turkey, Egypt and Israel, are producing extended bureaucratic documents with clear action plans to target professionals instead of the general public or media. On the other hand, the countries with high centralisation of political life, e.g. the Gulf monarchies, were inclined to framing strategies as broad visions that did not translate into specific project plans. This was combined by a reluctance to use digital strategies to improve structural imbalances in the economy, such as the dependence on oil and gas rent.

Thus, the digital agenda has been embraced fully only in the countries with a diversified economy. In the rest of the countries, the government decision-makers are reluctant to use digital technologies as instruments of solving national economic problems.

ANALYSIS

This brief uses the theoretical approaches developed by Murtha et al. to analyse the national strategies of the digital economies of 17 African countries: the top 10 economies by the size of nominal GDP and the top 10 economies by GDP per capita (with three countries[27] featuring on both lists).

The selected countries are extremely diverse in terms of the size of the economy, wealth, infrastructural challenges and digital development.[28] They can broadly be categorised into three groups:

1. Relatively diversified economy with a large population: Nigeria, South Africa, Egypt, Ethiopia, Kenya, Tanzania, Morocco, Sudan
2. Sufficient natural resources with a smaller population:
    a. Large land area with low population density: Algeria, Angola, Botswana, Namibia (this creates obvious infrastructural challenges)
    b. Small land area with higher population density: Gabon, Tunisia and especially Equatorial Guinea (Gabon, however, has a very low population density);
3. Small service-based economies of Mauritius and Seychelles, with high-income levels

Out of the 17 countries covered in this analysis, nine had published some digital strategies in the 2010s.[29] Egypt has three: national e-commerce strategy, strategy for social responsibility in ICT, and digital Arabic content strategy. In countries with no national digital strategic documents, the digital issues are addressed within general economic strategies (e.g. Nigeria's Integrated Infrastructure Master Plan or Ethiopia's Financial Inclusion Strategy). Overall, however, digital issues have not been incorporated in the national strategising in most leading African economies to any significant extent. National strategies for cyber security is another underdeveloped area: none of the countries in the study has addressed the issue directly in an extended document.

Table 1: Key Characteristics of the Economic and Digital Development of the Analysed Countries

Country	Land (000 sq. km)	Population (000)	Population Density (people per sq. km)	GDP (USD million)	GDP per capita (PPP)	Government Effectiveness (2017)	Oil and Gas rent in GDP, % (2016)	Network Readiness Index (WEF), Place	Global Innovativeness Index	e-government index (UN)
Nigeria	923.7	193,392.5	209.37	375,745	2,170	0,18	3.8%	119	22.37	0.3807
S. Africa	1,221.0	54,956.9	45.01	348,871	6,269	0,28	0.0%	65	45.36	0.6618
Egypt	1,001.4	96,983.0	96.85	253,369	11,583	–0.62	3.6%	96	27.16	0.488
Algeria	2,381.7	40,100.0	16.84	167,555	15,260	–0.6	13.4%	117	23.87	0.4227
Angola	1,246.7	24,383.3	19.56	122,123	2,995	–1.03	12.7%			0.3376
Sudan	1,861.4	40,235.0	21.62	117,487	1,126	–1.41	0.6%			0.2394
Morocco	446.5	33,337.5	74.66	109,708	2,528	–0.16	0.0%	78	31.09	0.5214
Ethiopia	1,104.3	99,391.0	90.00	80,561	421	–0.7	0.0%	120		0.3464
Kenya	580.3	45,533.0	78.46	79,263	1,538	–0.31	0.0%	86	31.07	0.4541
Tanzania	9,45.2	51,046.0	54.01	52,090	951	–0.63	0.0%	126	28.07	0.3929
Tunisia	1,63.6	10,982.7	67.13	39,952	3,629	–0.07	2.0%	81	32.86	0.6254
Botswana	581.7	2,024.9	3.48	17,406	5,131	0.43	0.0%	101	28.16	0.4253
Gabon	267.6	1,802.2	6.73	15,013	12,604	–0.94	10.4%	125		0,4313
Mauritius	2.0	1,261.2	630.60	13,266	4,774	0.9	0.0%	49	31.31	0.6678
Namibia	825.4	2,280.7	2.76	13,253	3,740	0.2	0.0%	99	28.03	0.4554
E. Guinea	28.0	1,2224	43.66	12,293	24,387	–1.44	16.5%[30]			0.2298
Seychelles	0.5	90.9	181.80	1,497	9,188	0.42	0.0%	74		0.6163

Sources: World Bank, UN and World Economic Forum

Correlation is evident between relative wealth (as indicated by GDP per capita) and the existence of national digital strategies. Out of the nine poorer countries (GDP per capita > US$4,000), only two (Kenya and Tunisia) have such strategies. This corresponds to their relatively high position in the network readiness index and e-government index (in terms of wealth). The digital economies of nations dependent on oil and gas rent (e.g. Persian Gulf countries or Russia) are developing faster, which is a major driver of diversification of the economic structure. (This is generally not the case with oil-producing countries in Africa.) However, of the eight countries with some oil and gas rent contribution to the GDP, only three have some form of national digital strategy.

Table 2: National Digital Strategy Documents

Country	Comprehensive National Digital Strategy	Digital Economy Strategy	E-Government Strategy	Digital Security Strategy	Others
Nigeria					Nigeria Vision 2020; Economic Recovery and Growth Plan, 2017–20; National Integrated Infrastructure Master Plan

S. Africa	National E-strategy, 2017–30				
Egypt		National E-commerce Strategy for Egypt		Social Responsibility Strategy in the ICT Sector	Digital Arabic Content National Strategy
Algeria	E-Algeria, 2013[31]				
Angola					Plan for National Development, 2018–22 (text n/a)
Sudan					
Morocco	Maroc Digital, 2020				PLAN D' ACCÉLÉRATION INDUSTRIELLE, 2014–20
Ethiopia					Growth and Transformation Plan II; National Financial Inclusion Strategy
Kenya	ICT Authority Strategic Plan, 2013–18				Kenya Vision, 2030
Tanzania					National E-Health Strategy, 2013–18
Tunisia	Tunisie Digitale, 2020				
Botswana			Botswana E-Government Master Plan 2015–21		
Gabon					Plan Strategique Gabon Emergent (Vision, 2025 et Orientations Strategiques, 2011–16)[32]
Mauritius	Digital Mauritius, 2030				
Namibia			E-Government Strategic Action Plan 2014–18		
E. Guinea					Plan Horizonte, 2020
Seychelles					Seychelles Blue Economy

Since only one out of the 17 countries in the sample has a dedicated digital economy strategy,[#] the economic agenda of the digital transformation of other countries had to be reconstructed from the comprehensive national digital strategies. Finally, the study yielded six cases for analysis: Egypt, Kenya, Mauritius, Morocco, Tunisia and South Africa.

Structure

In terms of their structure, all the strategies follow either a "vision-based" or an "issues-based" ("goal-based") approach to planning. In the former, a broad vision for the future is stated,[33] which is then divided into groups of goals (often called "strategic pillars"), followed by specific goals that serve as roadmaps of projects (or "initiatives"). In the issue-based approach, the vision is not stated explicitly, and the planning starts with the set of issues to be addressed or goals to be met. Both approaches mirror the processes that are common in strategic planning in the modern corporate world. Thus, the government body positions itself merely as an 'actor' in the digital economy, with limited resources and capabilities. This is a departure from the tradition of economic-planning in the mid-20th century, whereby the government was the ultimate authority in important issues of the economy.

Rumelt[34] noted that both vision- and goal-based approaches run the risk of creating ineffective strategic documents that do not call for mobilisation and prioritisation. For strategic planning to be effective, Rumelt believes that it should start with the analysis of barriers and limitations, with a focus on the relative competitive position of a company. Of the analysed strategies, only those from Kenya and Mauritius make a description of "weaknesses," sush as the lack of infrastructure, difficulties in developing and retaining human capital, and insufficient funding, which are strong barriers to digital development, especially in view of international competition. However, none of the countries elaborates on the idea of global competition of nations in the digital space. While Kenya's vision includes the need to become "a globally competitive digital economy," it does not specify the requirements for achieving this.

Turning a vision into a project roadmap needs elaborate discussion. In the case of Tunisia, the process took almost four years, from the initial meeting in Tabarka that set the vision in 2013 to the final discussion in 2017 that formulated the projects. Such a lengthy process helps achieve consensus amongst the numerous stakeholders of the digital economy ecosystem, allowing a greater degree of internalisation of the resulting strategy. However, it remains to be seen whether such a pace is adequate for strategic planning in the context of a rapidly evolving digital technology landscape.

Content

Content-wise, three themes are universal:

1. The development of infrastructure, with a focus on inclusive access to the internet

Egypt, whose document was developed by the United Nations Conference on Trade and Development on the request of the Egyptian government.

and the expansion of broadband capabilities;

2. The development of innovative entrepreneurship in the form of start-ups; and

3. The development of the ICT sector.

There is a growing recognition of the need for a broader approach to digital technology and its penetration into the traditional sectors of industry and agriculture. This theme is adequately explored in South Africa's strategy (with references to the digitalisation of industry, mining, agriculture, utilities and ocean-related industries) and is also touched upon in the strategies of Egypt, Morocco and Tunisia.

The roadmaps for developing digital infrastructure occupy a significant place in most of the strategies. They typically include a series of projects aimed at increasing connectivity capacity and bringing modern broadband internet to the maximum percentage of the population. It is an area with significant space for direct action by government actors, including investment and incentives for private telecom companies. One area that is insufficiently covered in the documents is the infrastructure for modern data processing. Since one of the forces of digital transformation is "big data analytics"[35] (now artificial intelligence), digital capability is widely defined in terms of data processing power. Africa is naturally disadvantaged in this area due to the climate: data centres produce heat at mass scale and are thus most effective in cold climates. Additionally, data centres are power-intensive and African nations are short on electric power generation and the necessary hardware requires significant financing. Currently, the continent hosts only two of the world's top-500 supercomputers, both in South Africa.[36] Thus, African companies that plan to compete globally in applications that require modern data analytics must use offshore processing capabilities, i.e. "cloud" computing services.[37]

None of the strategy documents discusses the issues of international cooperation or international competition. Despite the frequently cited strategic vision of turning the country into a "regional hub," the feasibility of achieving it is not analysed. For example, three of the North African countries—Egypt, Morocco and Tunisia—aim to become regional digital hubs, which implies inevitable competition. Yet, none of them recognises the competitive character of its ambitions.

CONCLUSION

The analysis shows that developing dedicated strategies for the digital economy (as standalone documents or as part of a broader national digital agenda) is yet to become an accepted part of national digital strategising. Many large African economies neither have dedicated documents for digital strategy nor address the issue in detail within the overall national strategies. In some nations, e.g. Algeria, the process of national digital strategising was taken up but subsequently abandoned. The national documents that do exist are dedicated only to a few issues of "e-government." Thus, the situation in these African nations is similar to that of West Asian countries,[38] whereby the agenda of digital transformation is yet to be internalised by stakeholders. This is further evident in the

lack of analysis of barriers and challenges in most of the documents; the plans appear standard, with shallow references to the social and economic situation. The analysed documents also put heavy emphasis on infrastructure development, with little attention to "softer" issues such as human capital, market fit and digital ecosystems.

While the continent faces digital infrastructure challenges, some of its companies have demonstrated a remarkable capacity to develop commendable solutions, e.g. M-Pesa in Kenya. Nurturing this capacity can help African nations to "leapfrog" into digital development. For this, two key barriers must be addressed:

1. Competence in building modern digital systems, which include not only the required technical knowledge but also the modern business and managerial skills; and
2. Markets for the new digital enterprises.

Most African countries have insufficient internal demand, being either small or poor by the international standards. One solution is to expand to international markets. While some strategies acknowledge this, they still need to identify a market niche with solid competitive advantages over both established and fast-developing digital economies. Thus, finding such a niche will be the focal point of national digital strategising in Africa, without which the situation may mirror the "speeded industrialisation" of the 1960s (promoted, for example, by Perroux[39]). Africa was part of this effort, as stated in President Kwame Nkrumah's speech of 1963: "We shall accumulate machinery and establish steel works, iron foundries and factories; we shall link the various states of our continent with communications; we shall astound the world with our hydroelectric power..."[40] Nearly 60 years later, this bold vision is still facing several challenges and the project remains unfinished.

The strategic plans for an economic breakthrough in Africa must rely not only on aspirational vision but also on sound analysis. The countries must find an effective niche in the global digital economy to accelerate technology-led inclusive social and economic development, with a focus on industrialisation, creating human capital and increasing agricultural productivity. To achieve these goals, Africa needs prioritised policies with consorted nationwide efforts and private-public partnership. ORF

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ENDNOTES

1. In 2015-2018 such strategies were introduced in countries as diverse as China, South Africa, Great Britain, Russia, France, Turkmenistan, Germany, etc.
2. Mario Canazza, "The Internet as a global public good and the role of governments and multilateral organizations in global internet governance", *Meridiano 47 - Journal of Global Studies,* vol. 19 (2018).
3. Jane Garrity, "Getting Connected: The Internet and Its Role as a Global Public Good", *Georgetown Journal of International Affairs* 18(1), 2017:6-8
4. The number of websites is estimated in the range of 1,5-2 billion (Web Server Survey, August 2018, https://news.netcraft.com/archives/2018/08/24/august-2018-web-server-survey.html), additionally there are millions of mobile apps and a significant number of "hidden" digital applications which reside within various technical systems, those cannot be countered by an external observer
5. One of the key features of digital technology is the intrinsic link between mass communication and economics
6. Close to 50% of the country's GDP in 2017, https://www.nation.co.ke/business/Yearly-mobile-money-deals-close-GDP/996-4041666-dtaks6z/index.html
7. Ranked #30 out of 54 African countries in 2017, in terms of GDP per capita. See, https://www.imf.org/
8. CIA World Factbook; https://www.cia.gov/library/publications/the-world-factbook/geos/cd.html
9. GSM Alliance. The Mobile Economy 2019 (https://www.gsmaintelligence.com/research/?file=b9a6e6202ee1d5f787cfebb95d3639c5&download); GSM Alliance. The Mobile Economy. Sub-Saharan Africa 2017 (https://www.gsmaintelligence.com/research/?file=7bf3592e6d750144e58d9dcfac6adfab&download)
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12. Richard P. Rumelt, *Good strategy, bad strategy: The difference and why it matters*. New York: Crown Business, 2011
13. Bahrain, Israel, Iraq, Iran, Jordan, Kuwait, Lebanon, Qatar, Oman, Saudi Arabia, Turkey, United Arab Emirates; Syria and Yemen, which are currently arenas of warfare were not included into analysis
14. Joao Reis , Marlene Amorim , Nuna Melão, Patricia Matos,"Digital Transformation: A Literature Review and Guidelines for Future Research", in *Trends and Advances in Information Systems and Technologies,* ed. Alvaro Rocha , Hojjat Adeli, Luis Paolo Reis, Sandra Costanzo (WorldCIST'18 2018. Advances in Intelligent Systems and Computing, vol 745. Springer)
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17. Ali M. Al-Khouri "Emerging Markets and Digital Economy" in *International Journal of Innovation in the Digital Economy*, 3, No. 2 (2012): pp. 57–69

18. Rumana Bukht and Richard Heeks *Development Implications of Digital Economies*. Paper No. 6. Digital Economy Policy in Developing Countries, Centre for Development Informatics, Global Development Institute, University of Manchester,2018.

19. Tomas Murtha, Stephanie Lenway, "The Idea of the State in the International Management Literature" in *Journal of International Business Studies*, . 2(1994); Tomas Murtha, Jennifer Spencerand Stephanie Lenway "Moving Targets: National Industrial Strategies and Embedded Innovation in the Global Flat Panel Display Industry" in *Advances in Strategic Management,* 13,(1994): 247-281; Tomas Murtha, Stephanie Lenway, Jeffrey Hart*Managing New Industry Creation: Global Knowledge Formation and Entrepreneurship in High Technology*. Stanford,Stanford University Press, 2001; Jennifer Spencer, Tomas Murtha, and Stephanie Lenway "How Governments Matter to New Industry Creation" in*Academy of Management Review*, 30, No. 2(2005):. 321-337; Stephanie Lenwayand Tomas Murtha "The State as Strategist in International Business Research" in: *Journal of International Business Studies*, 25, No. 3(1994): 513-535.

20. Bjørn Harold Johnson, Bengt-åke Lundvall*Promoting Innovation Systems as a Response to the Globalising Learning Economy*. 2005; Bengt-åke Lundvall"Technology Policy in the Learning Economy" in *Innovation Policy in a Global Economy,* ed. Archibugi, D., Howells, J., Michie, J. 1999; Bengt-åke Lundvall "Innovation Policy and Economic Theory" in *Transformation Towards a Learning*, ed. Schienstock, G., Kuusi, O. 1999; Bengt-åke Lundvall, and Peter Maskell "Nation States and Economic Development: From National Systems of Production to National Systems of Knowledge Creation and Learning" in: *The Oxford Handbook of Economic Geography,* ed. Clark, G. L.,Feldman, M. P., Gertler, M. S., , 2000; Bengt-åke Lundvall, Bjørn Harold Johnson, Esben Andersen, Bent Dalum"National systems of production, innovation and competence building" in*Research Policy*, 31, No. 2 (2002)_:. 213-231

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26. Vladimir Korovkin "Natsionalniye programmy tsifrovoi economiki stran Blizhnego Vostoka" [National Programs of Digital Economy in the Countries of the Middle East] in *Ars Administrandi*, 11, No. 1, (2019): 151-175
27. Egypt, Algeria and South Africa
28. One can find about the same degree of diversity in Asia, where also 3 countries are both on the list of biggest and wealthiest economies. The figure for Western Europe would be 5, while for Latin America it would be 7
29. For comparison: 8 out of 12 countries of West Asia have published a digital strategy.
30. Latest available data is for 2016.
31. The document was developed in 2008, no extension was officially published after 2013
32. There is an eGabon project (www.egabon.ga) carried out by World Bank and the government of Gabon, yet its strategy is not available
33. E. g. "Kenya as a regional ICT hub and a globally competitive digital economy" or "Devenir une référence numérique international et faire des TIC un levier important pour le développement socio-économique" (Tunisia)
34. Richard Rumelt *Good strategy, bad strategy: The difference and why it matters*.
35. Gartner, 2012
36. https://www.top500.org/lists/2018/11/
37. This raises important questions on data protection in cross-border transactions. These questions are not addressed in the current national strategies, though some of them (e. g. Tunisia and Kenya) explicitly state the necessity of development of new digital legislation. The Convention on Cybersecurity and Personal Data Protection of the African Union that was accepted in 2014 gives some important guidelines; those are to be elaborated in national laws (the text of the convention is available at https://au.int/sites/default/files/treaties/29560-treaty-0048_-_african_union_convention_on_cyber_security_and_personal_data_protection_e.pdf)
38. There some leading economies like Saudi Arabia, Iran or Kuwait do not have national digital strategies, while Bahrein, Jordan, Lebanon, and Iraq have abandoned digital strategizing
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