



MENA  
Cloud Alliance

# Cloud Competitiveness Index

2023

Measuring the Regional Cloud Ecosystem

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# PREFACE

The MENA Cloud Alliance has received a lot of helpful feedback on our Cloud Competitiveness Index, which inspired us to create an even more comprehensive and inclusive version of the report.



We worked with some of the best minds in the industry, both within the region and globally, to develop the 2023 version of the Index. We also made sure to refine our methodology to provide a more accurate and objective portrayal of the regional cloud landscape. Our team at the alliance also designed an interactive tool to help visualise our findings and facilitate the consumption of the Index.

The Index serves as a tool to encourage conversations within the cloud computing ecosystem and as a way to measure the health of the cloud market and track the progress of regional economies in adopting cloud technologies.

We welcome members of the regional and global cloud community to share their thoughts and provide feedback on the Index so that we can continue to improve it each year.

**OMID MAHBOUBI**

FOUNDER - EXECUTIVE DIRECTOR

A handwritten signature in dark ink, reading 'Omid Mahboubi' with a stylized flourish at the end.

## EXECUTIVE SUMMARY

# WHY AN INDEX

The Middle East and North Africa region is home to some of the world's most innovative and tech-savvy nations. As these countries transition from oil-dependent economies to digital ones, they have become early adopters and even pioneers of cutting-edge technology. Cloud computing is at a turning point, moving from a promising concept to a true enabler of emerging technologies. A status that has been cemented by the cloud's undeniable role in helping us cope with the pandemic. The cloud is now expected to deliver on many aspects of our lives and provide a foundation for more emerging technological advancements to be built.

There are many new buzzwords in the market that would be difficult or entirely impossible to implement without a cloud-based support system. However, this transition also comes with a number of challenges such as regulation, security, talent, connectivity, government and business community support. To make informed decisions, it is important for players in the ecosystem to have a good understanding of the current state of regional cloud computing markets.



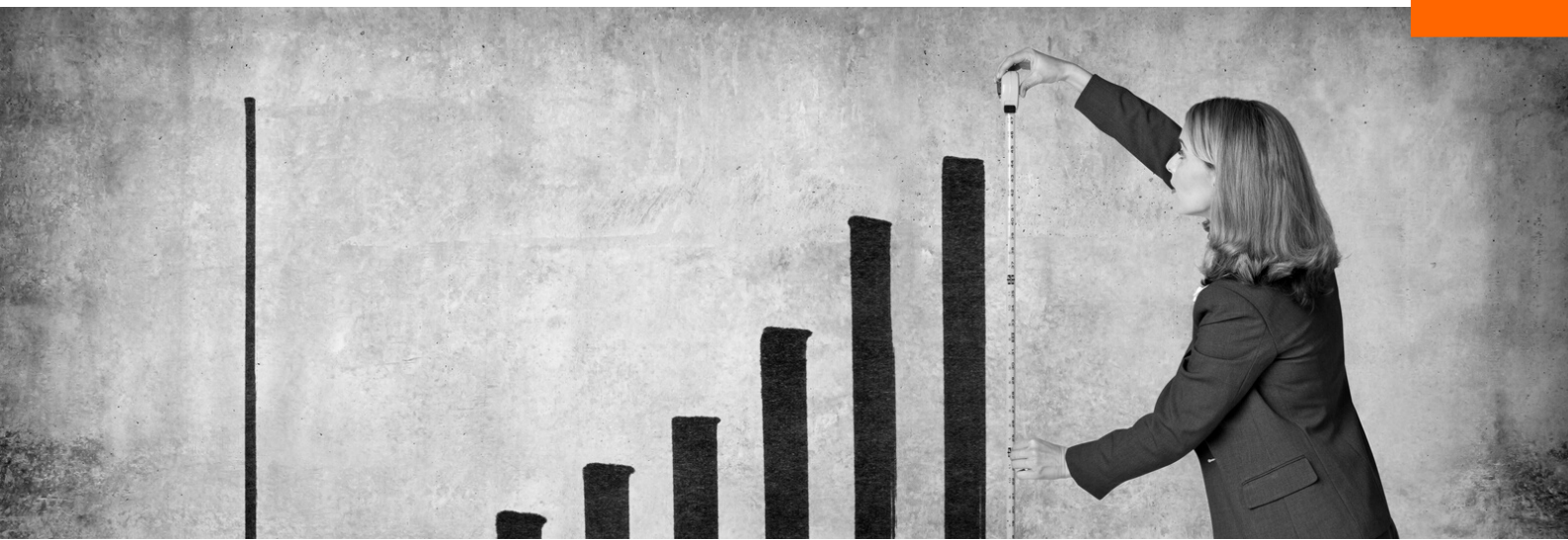


## EXECUTIVE SUMMARY

# THE INDEX

The Cloud Competitiveness Index 2023 (CCI2023) is an ongoing project that provides an overview of the current state and future prospects of the cloud ecosystem in 15 countries in the region. We have created an index that measures the competitiveness of the cloud computing market in these countries and provides a tool for identifying the strengths and weaknesses of the regional economies. We used mostly publicly available data to create a composite index that represents the complexities of a nation's technology infrastructure and helps to advance cloud computing in the region. Our goal is to provide major market players with a fact-based understanding of the status of the cloud ecosystem in these countries.

MENA Cloud Alliance recognizes that cloud competitiveness can vary significantly depending on the economic and institutional context, and we see this report as an opportunity for dialogue, debate, and ongoing learning.



# MEASURING COMPETITIVENESS



Fig. 1: CCI 2023 Domains

## Domains & Pillars

In the context of the Cloud Competitiveness Index 2023 (CCI2023), cloud competitiveness refers to the policies, practices, and characteristics that allow a country to effectively use cloud computing. The index provides a way to evaluate what makes a country more conducive to cloud services. Like the previous version, the CCI2023 consists of domains and sub-domains (pillars) that contribute to a country's overall score. The final ranking is calculated by taking the average of scores in each of the five domains.

(Fig 1: CCI 2023 Domains)

# WHAT WE MEASURED

The index consists of five domains: "Regulation" (Domain 1) assesses the extent to which a country's regulatory framework supports the development and use of cloud services; "Talent" (Domain 2) measures the competitiveness of the workforce in the country's cloud market; "Connectivity" (Domain 3) refers to the quality of the network infrastructure that supports the delivery of cloud products and services; "Government" (Domain 4) describes the role of the government in the country's cloud ecosystem, and "Business" (Domain 5) evaluates the business environment for cloud stakeholders in the country.

(Fig 2: CCI 2023 Pillars)

## Cloud Competitiveness Index 2023

REGULATION	TALENT	CONNECTIVITY	GOVERNMENT	BUSINESS
Cloud Regulation	Labor Market	Infrastructure & Access	E-Participation	Market
Regulatory Quality	Skills	Penetration	Cybersecurity	Innovation Capability
Green Regulation	Growth	Affordability	Future Orientation	Business Dynamism
Intellectual Property Protection				

Fig. 2: CCI 2023 Pillars

# DOMAINS & PILLARS

## REGULATION

**The regulatory environment must support the cloud computing model for services to take off on a national, regional, and even global level. One of the biggest challenges for cloud adoption is the absence of relevant regulatory frameworks or, just as challenging, the presence of vague, cumbersome, or outdated legislation.**

In the post-GDPR technology world, it is crucial that countries have clear laws and regulations regarding the collection, use, and cross-border transfer of data. Countries should also create national data protection regimes that are consistent with those of the region and the world. However, simply having these laws in place does not make an economy competitive in the cloud. It takes a strong regulatory environment to both protect a country's data assets and encourage the adoption of new technologies.

A regulatory environment that supports the development, distribution, and use of cloud services is characterized by the existence of a Cloud First Policy, an efficient cross-border data transfer regime, adequate regulatory quality, a responsible green regulation mechanism, and a protective intellectual property environment.



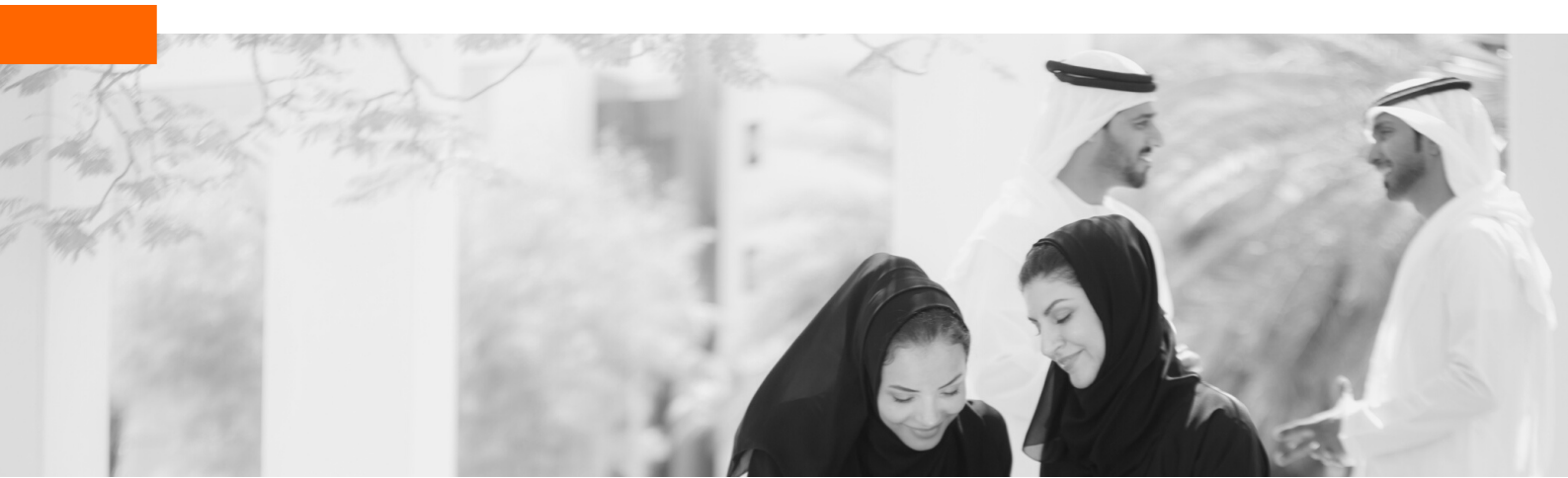
# DOMAINS & PILLARS

## TALENT

**Finding top talent in the field of cloud computing can be a challenge for organizations around the world. The demand for skilled professionals in this field is high, as more and more companies are adopting cloud technologies and services to support their operations.**

In our region, the demand for cloud computing talent may be especially acute, as it is home to many rapidly-growing businesses that are looking to leverage the benefits of the cloud. In response to feedback we received after the release of the previous iteration of the index, we conducted a detailed analysis of indicators to accurately represent the current state of local cloud talent.

Many regional economies are heavily reliant on the expatriate community to achieve their ambitious goals. In order to become a talent hub, policies must be implemented to not only attract skilled individuals but also retain them. It is also essential for an economy to develop a strong local workforce capable of filling current gaps and expanding the talent pool to meet future needs. However, the challenge remains of how to prepare an increasingly educated population for jobs of the future.





# DOMAINS & PILLARS

## CONNECTIVITY

**Connectivity is an often undervalued aspect of the cloud. In order to be competitive, cloud services need to be supported by a reliable, high-quality, and reasonably priced infrastructure.**

This domain of the Index examines a country's competitiveness in terms of providing reliable access to the cloud. Excellent international connectivity and high-quality broadband are fundamental for the growth of the cloud market. As cloud service providers prioritize proximity and accessibility to end users, it is important to assess a country's ability to create an optimal environment for the cloud.

We believe that top-quality connectivity is essential for digitization. Another important aspect of this domain is affordability, which can be both a barrier and a contributor to the digital divide in many parts of the world, including the MENA region.



# DOMAINS & PILLARS

## GOVERNMENT

**The government's role in promoting and adopting cloud technologies cannot be underestimated. When governments actively use and promote innovative ICT products and services, it can have a transformative impact not only on the ICT industry and cloud computing, but on many other sectors of the economy as well.**

The adoption of cloud-first policies, national G-cloud initiatives, and the provision of e-services by technologically competitive countries highlight the important role of governments as major stakeholders in the cloud. Governments can also help address security concerns related to cloud consumption, which may be of particular concern in the Middle East & North Africa region compared to other regions.

One of the reasons for the region's success is the government's preparation for the future. Many regional governments have started to digitize their economies, and this is an area in which the region excels on a global scale. It is worth noting that, due to the adoption of cloud technologies, some regional players are becoming leaders in new technologies and are transitioning from being merely tech importers to competitive tech exporters.



## EXECUTIVE SUMMARY

# DOMAINS & PILLARS

## BUSINESS

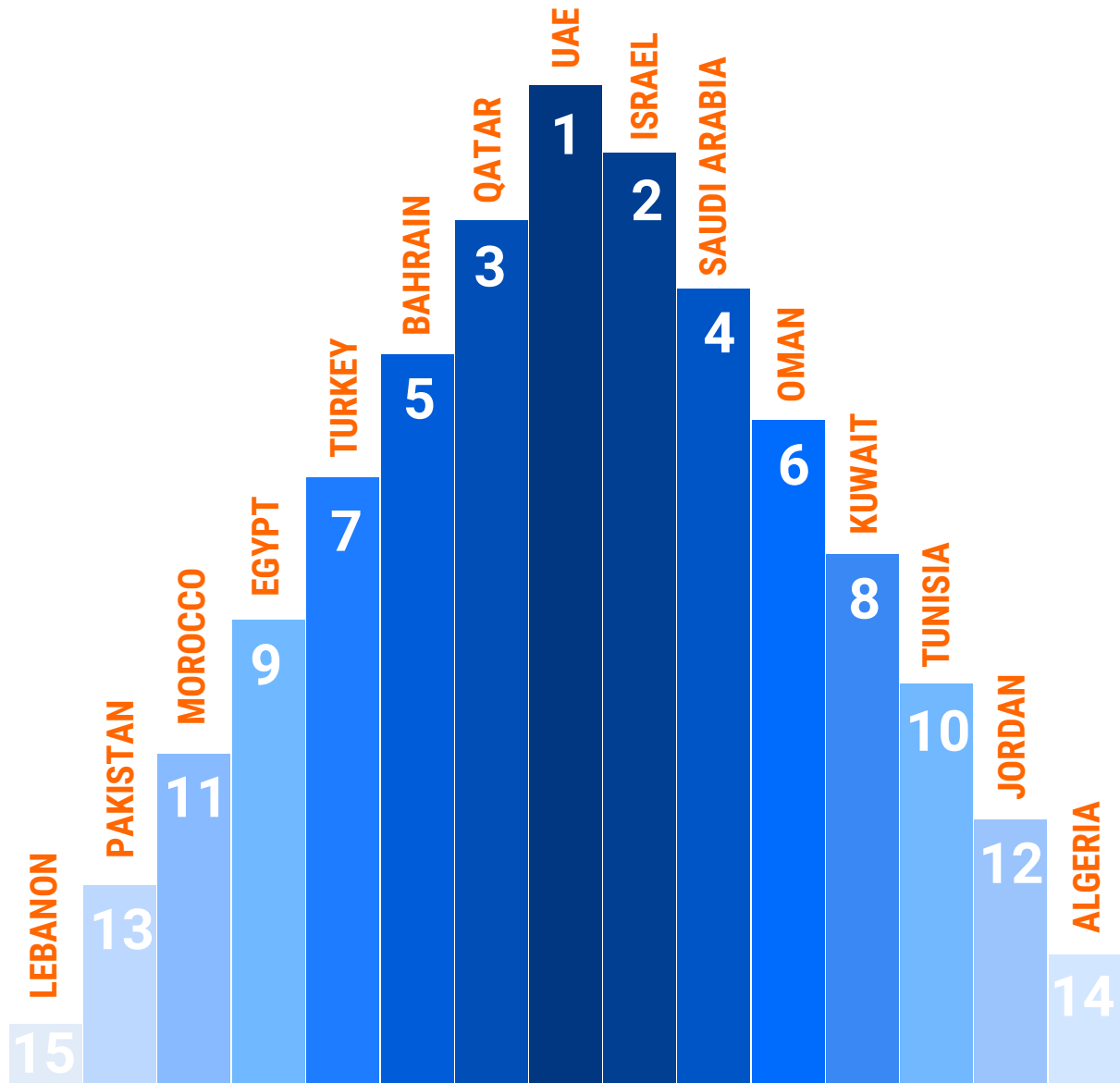
**An accommodating business landscape can greatly impact the creation and provisioning of cloud services. Both global and local players require a supportive environment to operate.**

The region has made significant progress in this area over the years. In order to successfully transition from an oil-based economy to a digital one, it is crucial for the region to attract global investors. Cloud computing can help facilitate this transition by providing benefits such as faster time-to-market and agility, but these benefits can only be fully realized in a supportive market that encourages adoption.

In order to assess the elements that make up a competitive business ecosystem that can effectively utilize cloud computing, we analyzed indicators related to Market, Innovation Capability, and Business Dynamism in this iteration of our index.



## RANKINGS



Cloud  
Competitiveness  
Index  
2023

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# RANKINGS

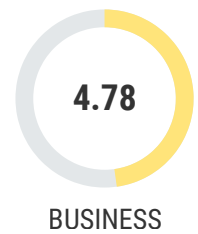
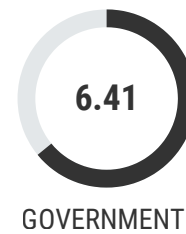
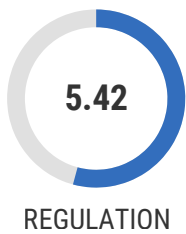
COUNTRIES	RANKING	Cloud Regulation	Regulatory Quality	Green Regulation	Intellectual Property Protection	Labor Market	Skills	Growth	Infrastructure & Access	Penetration	Affordability	E-Participation	Cyber Security	Future Orientation	Market	Innovation Capability	Business Dynamism
UAE	7.57	8.00	7.29	7.21	7.58	6.62	4.93	7.29	9.07	9.31	8.16	9.01	9.81	8.31	6.97	5.23	6.93
ISRAEL	7.41	8.50	5.83	7.24	7.60	7.11	5.96	5.12	7.81	8.92	8.11	8.75	9.09	6.85	6.72	7.42	7.96
QATAR	6.93	10.00	6.95	5.97	7.45	6.34	3.83	5.33	8.67	8.20	8.61	6.09	9.45	7.38	5.99	5.00	6.60
SAUDI ARABIA	6.82	8.50	6.64	6.15	7.17	5.66	4.19	5.40	8.89	8.74	5.81	8.22	9.95	8.08	6.05	5.06	5.31
BAHRAIN	6.45	8.50	6.09	4.92	6.96	6.64	3.31	5.38	9.02	7.44	6.25	7.52	7.79	7.55	6.09	3.88	6.43
OMAN	6.38	7.75	6.63	5.15	7.59	5.58	3.00	4.09	8.54	8.01	6.19	7.42	9.60	7.51	5.54	4.13	6.28
TURKEY	5.81	4.00	3.68	6.45	4.79	5.29	2.87	4.27	8.44	6.63	6.29	8.60	9.75	6.34	4.86	4.45	5.88
KUWAIT	5.59	5.75	5.49	4.57	5.18	5.43	2.76	3.64	8.77	7.77	6.26	6.97	7.51	5.68	5.13	3.03	5.61
EGYPT	5.55	5.50	5.03	6.65	4.75	5.55	3.00	3.09	7.68	5.58	6.86	5.73	9.55	6.06	4.53	3.96	5.61
TUNISIA	5.37	5.50	4.18	7.30	4.50	4.64	2.68	3.05	7.15	6.65	6.90	6.03	8.62	4.78	5.18	3.27	5.90
MOROCCO	5.36	5.50	5.41	6.79	6.54	5.15	2.19	2.89	8.15	6.68	4.34	4.72	8.24	5.64	5.40	3.51	5.98
JORDAN	5.23	3.00	5.69	7.43	6.43	5.77	2.67	3.80	6.89	4.68	4.22	6.59	7.10	5.75	5.48	3.88	5.66
PAKISTAN	4.64	4.25	4.72	5.13	5.03	5.13	2.12	3.44	5.56	3.12	5.07	5.65	6.49	5.31	4.05	3.58	6.33
ALGERIA	4.36	4.00	4.48	5.65	4.99	4.71	2.04	2.85	7.08	6.13	4.04	3.74	3.40	4.03	4.48	3.44	5.62
LEBANON	4.31	1.25	3.38	5.98	3.85	5.44	3.80	3.74	7.69	4.91	4.48	4.25	3.04	3.19	4.98	3.85	5.30





## COUNTRY PROFILES

# TUNISIA



5.50 ▶ Cloud Regulation  
4.18 ▶ Regulatory Quality  
7.30 ▶ Green Regulation  
4.50 ▶ Intellectual Property Protection



4.64 ▶ Labor Market  
2.68 ▶ Skills  
3.05 ▶ Growth



7.15 ▶ Infrastructure & Access  
6.65 ▶ Penetration  
6.90 ▶ Affordability



6.03 ▶ E-Participation  
8.62 ▶ Cybersecurity  
4.78 ▶ Future Orientation



5.18 ▶ Market  
3.27 ▶ Innovation Capability  
5.90 ▶ Business Dynamism





## COUNTRY PROFILES

# TUNISIA

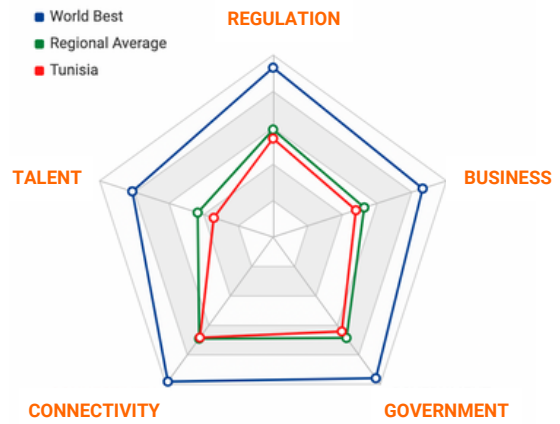
**Cloud Competitiveness Index**..... **Rank (out of 15)** 10..... **Value (0-10)** 5.37

**REGULATION**..... **Rank (out of 15)** 10..... **Value (0-10)** 5.42

Cloud Regulation.....	10.....	5.50
Regulatory Quality.....	13.....	4.18
Green Regulation.....	2.....	7.30
Intellectual Property Protection.....	14.....	4.50

**TALENT**..... **Rank** 13..... **Value** 3.42

Labor Market.....	15.....	4.64
Skills.....	11.....	2.68
Growth.....	13.....	3.05



**CONNECTIVITY**..... **Rank** 9..... **Value** 6.83

Infrastructure & Access.....	12.....	7.15
Penetration.....	9.....	6.65
Affordability.....	4.....	6.90

**GOVERNMENT**..... **Rank** 10..... **Value** 6.41

E-Participation.....	10.....	6.03
Cybersecurity.....	8.....	8.62
Future Orientation.....	13.....	4.78

**BUSINESS**..... **Rank** 10..... **Value** 4.78

Market.....	9.....	5.18
Innovation Capability.....	14.....	3.27
Business Dynamism.....	8.....	5.90



## COUNTRY PROFILES

# TUNISIA

The "Tunisia Digital 2020" National Strategic Plan has been developed to position Tunisia as an international reference for digital development as a major lever for socio-economic development and to provide the country with technology infrastructure in line with a modern economy.<sup>1</sup>

The Tunisian government is working to develop its own cloud for sovereign data, such as citizen registration data, which must be hosted locally due to confidentiality concerns. Under the Tunisie Digitale program of the PNS (Programme National de la Stratégie), the CNI (Centre National Informatique) is looking to improve e-government functions and establish an inter-ministry network to share digital information between government departments while protecting data confidentiality and citizens' right to privacy.<sup>2</sup>

The widespread deployment of a nationwide fiber-optic network and access to international submarine cables has contributed to the rapid growth of the internet industry in Tunisia. In 2020, nearly 9 million mobile broadband subscriptions were recorded.<sup>3</sup> The country also has some of the most affordable connectivity numbers in our index.

The Labor Market is a weak point for Tunisia's Talent domain. Improvements in indicators such as Hiring and Firing Practices, Cooperation in Labour-Employee Relations, Flexibility of Wage Determination, Ease of Hiring Foreign Labour, and Pay and Productivity can certainly help the country's ranking in this domain. Tunisia also has the highest number of Highly-Educated Unemployment in the region, which also contributes to its current ranking. Another important indicator that requires attention is the Government Long-term Vision, where Tunisia currently ranks the lowest in the region.

In the Business domain, Tunisia can improve its position by focusing on Innovation Capability indicators, particularly in terms of Diversity of Workforce, State of Cluster Development, Multi-Stakeholder Collaboration, Patent Application, and Buyer Sophistication. Although the country has made progress in its growing entrepreneurial scene, for example by introducing the Start-up Act,<sup>4</sup> Entrepreneurial Culture indicators such as Growth of Innovative Companies and Companies Embracing Disruptive Ideas still need significant improvements if Tunisia aims for higher rankings in our index.

1) <https://www.mtc.gov.tn/>

2) <https://oxfordbusinessgroup.com/overview/connected-society-national-plans-are-under-way-improve-it-innovation-cloud-storage-platforms-and-e>

3) <https://www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx>

4) <https://www.gsma.com/mobilefordevelopment/blog/exploring-the-rising-tunisian-start-up-ecosystem/>

## TECHNICAL NOTES

### Computation, Weightings, & Indicators

This section explains our detailed methodology and the structure behind the Cloud Competitiveness Index 2023. Scores were derived from publicly available and well-recognized data sources, which have been referenced and credited in this report.

#### Computation and Composition of the CCI2023

The latest iteration of our Cloud Competitiveness Index was computed based on successive aggregations of scores, from the indicator level, up to the pillar & domain level, and ultimately to the overall CCI score. The overall CCI2023 score is the average of the five domains - each consisting of underlying pillars weighed based on impact as shown below. For individual indicators, prior to aggregation, original values were transformed into a progress score ranging from 0 to 10, with 10 being the ideal state.

The following section indicates the description of each pillar and the sources from which the original values were derived.

An interactive tool has been designed to facilitate the consumption of our data and can be accessed at [www.menacloud.org/cloud-index-2023](http://www.menacloud.org/cloud-index-2023). We encourage our users to refer to the original sources for additional information on the nature of underlying indicators used to build the Index.