

# Policies and best practices for leveraging the use of emerging technology and innovation in the development of stronger Arab public institutions

ESCWA meeting on Technology and Innovation for Arab Public Institutions  
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# Outline



## Introduction

- Contents of the Study
- Public Sector Institutions
- Public Sector and SDGs
- Technology and Innovation to enhance RITE Principles in Public Sector



## Technology and Innovation in Arab Public Institutions

- E-government in Arab Countries
- COVID-19 pandemic and the use of emerging technologies
- Smart Sustainable Cities and the use of ICT and digital technologies
- Innovation in the Arab public institutions



## Enhancing connectivity, accessibility and trust through coherent digital platform in Arab Public Institutions

- Digital public infrastructure (DPI)
- Hard digital infrastructure and Soft digital infrastructure
- Emerging technologies policies and regulations in the Arab countries



## Emerging technologies & innovation trends in Arab Public Institutions

- Artificial Intelligence (AI)
- Big Data Applications
- Immersive and Blockchain technologies
- Geospatial technologies



## Recommendations

- Policy recommendations
- Practical recommendations

# Introduction: Contents of the Study

- The study aims at supporting the **Arab decision-** implementation of digital government **strategies** and best practices and practical recommendations.
- It focuses on the **deployment** and **use** of **digital technologies** and **innovation** to improve internal p the delivery of enhanced digital public services.
- It consist of **FIVE** main **Chapters**:

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# Introduction: Public Sector Institutions

- The **public sector** is composed of both the **public organizations**, or public enterprises, and **public operations and services** and is considered as a **key segment** of nations' economy.
- It includes all institutions, agencies, corporations and entities owned, controlled and managed by the government.
- One of the main role of the public sector is to provide different **operations** and **services** to the general public:
  - **For example:** Public healthcare, education, digital public infrastructure, transportation, energy, among others.
- Nowadays, citizens expect from the public sector to provide more **responsive**, **inclusive**, **trustworthiness** and **effective** (RITE) operations and services.
- Many governments, including the **Arab** ones, are making efforts to improve the delivery of their public services through the use of **technology** and **innovation**.



Source: <https://novapublishers.com/shop/public-services-management-opportunities-and-challenges/>

# Introduction: Public Sector and the SDGs

## SDG 9

(Industry, Innovation and Infrastructure)

Build resilient **infrastructure**, promote inclusive and sustainable industrialization and foster innovation.

## SDG 16

(Peace, Justice & Strong Institutions)

Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build **effective, accountable** and **inclusive** institutions at all levels

## SDG 17

(Partnership for the Goals)

Strengthen the means of implementation and revitalize the **Global Partnership** for Sustainable Development

## Public Sector and targets of SDGs 9, 16 and 17

| Public sector targets   | SDG's targets                                | Selected Examples of impacts on sustainable development  |
|---|--|--|
| <b>Build resilient infrastructure</b>                                 | 9.1, 9.4, 9.a, 9.c                           | <ul style="list-style-type: none"> <li>- Support economic development</li> <li>- Improve quality of life</li> <li>- Increase access to information.</li> </ul>   |
| <b>Inclusive and sustainable industries</b>                           | 9.2, 9.3, 9.4, 9.5, 9.b                      | <ul style="list-style-type: none"> <li>- Raise industry's share of employment and gross domestic product</li> <li>- Empower national economy</li> </ul>  |
| <b>Enhance access to science, technology and innovation</b>           | 9.5, 9.b, 9.c, 17.6, 17.7, 17.8, 17.6, 17.18 | <ul style="list-style-type: none"> <li>- Enhance science, technology and innovation diplomacy</li> <li>- Provide technology-based public operations and services</li> <li>- Boost Research and Development</li> </ul>  |
| <b>Improve public administration and the quality of public sector</b> | 16.5, 16.6, 16.7, 16.10, 16.b                | <ul style="list-style-type: none"> <li>- Reduce corruption</li> <li>- develop transparent, accountable and effective public institutions</li> <li>- Ensure public access to information</li> <li>- Make decision-making more responsive, representative and inclusive at all public institution levels.</li> </ul>   |
| <b>Multi-stakeholder partnership</b>                                  | 16.8, 17.3, 17.6, 17.9, 17.16, 17.17         | <ul style="list-style-type: none"> <li>- Enhance Global Partnership for sustainable development</li> <li>- Promote public, public-private and civil society partnerships</li> <li>- Mobilize and share knowledge and experiences</li> <li>- Support North-South, South-South and triangular cooperation for the means of implementing the SDGs.</li> </ul> |

# Introduction: Technology and Innovation to enhance RITE Principles in Public Sector

## (R) Responsiveness

the ability of public sector institutions to address the interests and needs of the public they serve within a reasonable timeframe in addition to the ability of these institutions to adjust and adapt services and policies to meet changing societal needs

## (I) Inclusiveness

the equal rights, participation, entitlement and treatment that enables equal opportunities and access to all resources and services by all people with their right to voice their opinions and needs.

## (T) Trustworthiness

the ability of a trusted entity (person or institution) to serve the interests of the trustor (citizen or business).  
the perception of conviction in the reliability and integrity of the trusted entity, including those concerns related to security and privacy.

## (E) Effectiveness

meeting the needs of citizens by allocating the resources needed to deliver quality services and to devolve effective policies and programs and use adequate measurement tools to evaluate the performance of these institutions in meeting their goals and targets.

## Technology in public institutions

can help in developing operations and services that are based on citizen's needs (i.e. **responsiveness** & **effectiveness**), designed to meet the needs of all society's segments (i.e. **inclusiveness**) and safeguarded to detect frauds and hacking attempts (i.e. **trustworthiness**).

## Innovation in public institutions

can help in building systems that are able to enhance and qualify responses (i.e. **responsiveness**), communicate and interact equally with their citizens (i.e. **inclusiveness** and **effectiveness**) and use innovative solutions to secure data and systems (i.e. enhance **trustworthiness**).



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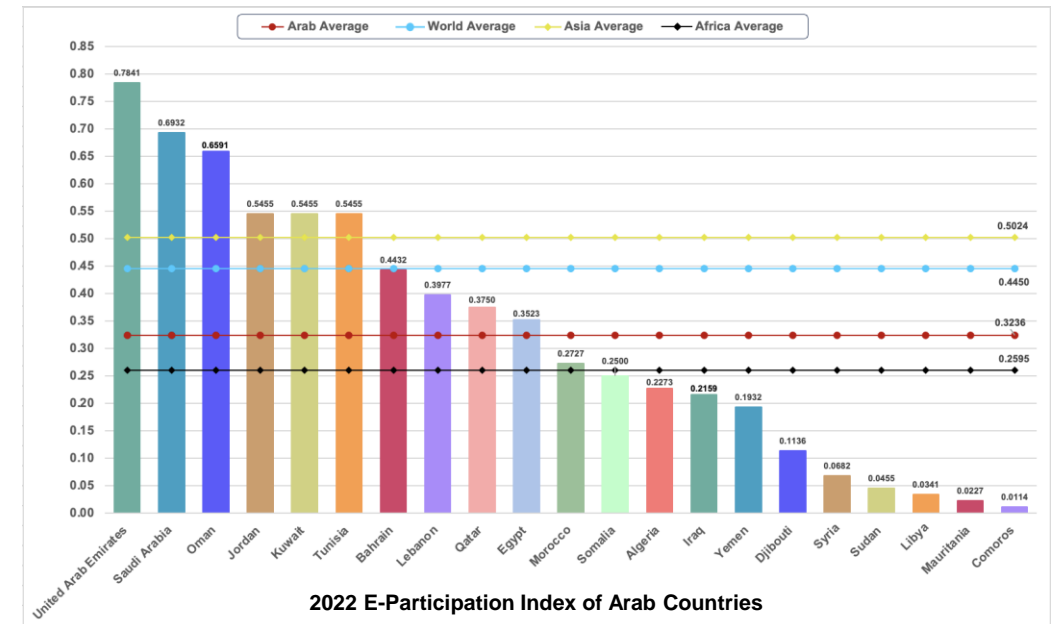
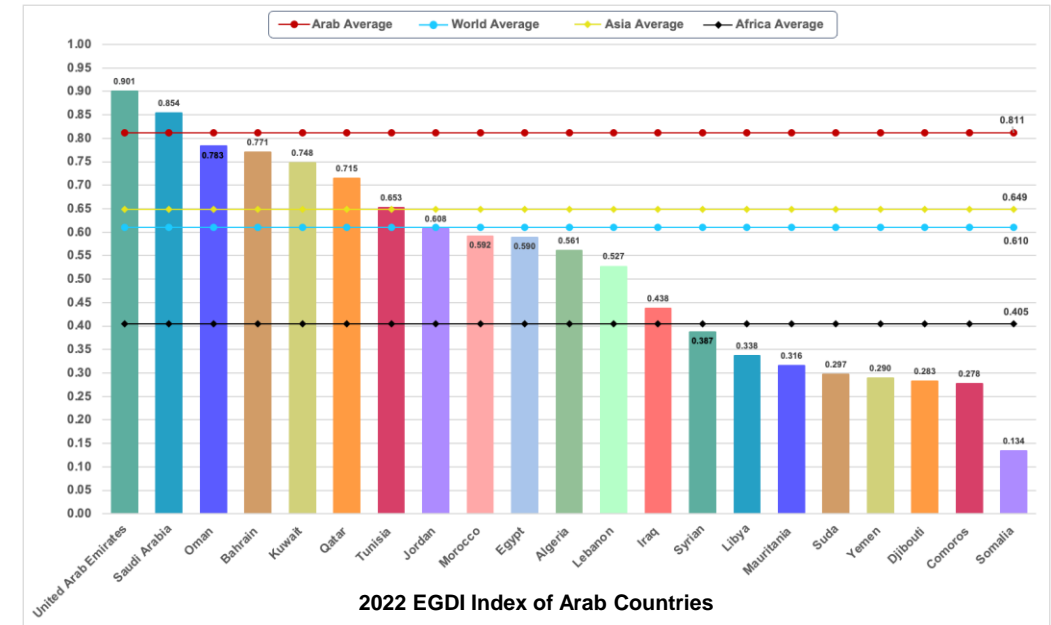
## Chapter 2

# Technology and Innovation in the Arab Public Institutions

# E-government in Arab Countries

## 2022 E-Government Development Index (EGDI) of Arab Countries

| Country Name | e-Gov Rank 2020* | e-Gov Rank 2022 | e-Gov Index | EGDI 2022 | e-Gov Rank Change | Online Service Index | Human Capital Index | Telecom Infra. Index |
|--------------|------------------|-----------------|-------------|-----------|-------------------|----------------------|---------------------|----------------------|
| UAE          | 21               | 13              | 0.901       | 0.9010    | +8                | 0.9014               | 0.8711              | 0.9306               |
| Saudi Arabia | 43               | 31              | 0.8539      | 0.8539    | +12               | 0.822                | 0.8662              | 0.8735               |
| Oman         | 50               | 50              | 0.7834      | 0.7834    | 0                 | 0.7423               | 0.8067              | 0.8012               |
| Bahrain      | 38               | 54              | 0.7707      | 0.7707    | -16               | 0.7523               | 0.8154              | 0.7444               |
| Kuwait       | 46               | 61              | 0.7484      | 0.7484    | -15               | 0.6973               | 0.7706              | 0.7774               |
| Qatar        | 66               | 78              | 0.7149      | 0.7149    | -12               | 0.6094               | 0.715               | 0.8203               |
| Tunisia      | 91               | 88              | 0.653       | 0.6530    | +3                | 0.6031               | 0.6911              | 0.6646               |
| Jordan       | 117              | 100             | 0.6081      | 0.6081    | +17               | 0.6594               | 0.6967              | 0.4681               |
| Morocco      | 106              | 101             | 0.5915      | 0.5915    | +5                | 0.4721               | 0.635               | 0.6676               |
| Egypt        | 111              | 103             | 0.5895      | 0.5895    | +8                | 0.573                | 0.6375              | 0.5579               |
| Algeria      | 120              | 112             | 0.5611      | 0.5611    | +8                | 0.3743               | 0.6956              | 0.6133               |
| Lebanon      | 127              | 122             | 0.5273      | 0.5273    | +5                | 0.4257               | 0.6656              | 0.4907               |
| Iraq         | 143              | 146             | 0.4383      | 0.4383    | -3                | 0.206                | 0.5888              | 0.5201               |
| Syrian       | 131              | 156             | 0.3872      | 0.3872    | -25               | 0.3053               | 0.4983              | 0.3581               |
| Libya        | 162              | 169             | 0.3375      | 0.3375    | -7                | 0.099                | 0.7534              | 0.1601               |
| Mauritania   | 176              | 172             | 0.3157      | 0.3157    | +4                | 0.0952               | 0.3873              | 0.4648               |
| Palestine*** | --               | --              | --          | --        | --                | --                   | --                  | --                   |
| Sudan        | 170              | 176             | 0.2972      | 0.2972    | -6                | 0.2118               | 0.3599              | 0.3199               |
| Yemen        | 137              | 178             | 0.2899      | 0.2899    | -5                | 0.3393               | 0.3633              | 0.1671               |
| Djibouti     | 179              | 181             | 0.2833      | 0.2833    | -2                | 0.2208               | 0.3529              | 0.276                |
| Comoros      | 177              | 182             | 0.2778      | 0.2778    | -5                | 0.0326               | 0.471               | 0.33                 |
| Somalia      | 191              | 192             | 0.134       | 0.1340    | -1                | 0.2944               | 0                   | 0.1074               |





# COVID-19 pandemic and the use of emerging technologies

## Robots

### Robots:

- Deliver medical supplies and meals within hospitals and to patient room, guaranteeing a contactless delivery process.
- **Tunisia:** police robot to patrol public areas to ensure full application of quarantine measures

## AI-based thermal imaging cameras

### The AI-based thermal imaging cameras:

- Scan public spaces to identify any potentially sick people.
- **UAE:** police AI-based helmet to automatically detect the body temperature.
- **Tunisia:** police AI-based thermal cameras to detect body temperature.

## Telemedicine and E-learning

### Telemedicine:

- Provide healthcare services virtually to people.
- **Egypt:** AI-Balto (or 'Coat') application to provide healthcare services to citizens of Port Said governorate.

### E-learning:

- Guarantee the continuity of educational systems
- **Most Arab countries.**

## Telework

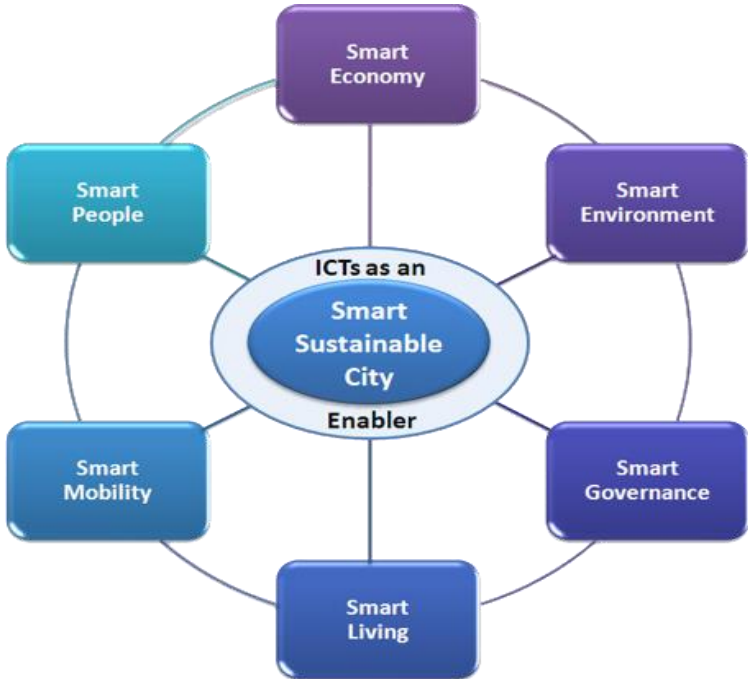
### Telework:

- Guarantee the continuity of business and government systems.
- **Jordan:** greater Amman municipality used Accella Cloud Technology to manage the reopening process of businesses and to provide the approval needed for business operations
- **Morocco:** MoE provided tools to civil servants to carry out their critical professional duties

# Smart Sustainable Cities and the use of ICT and digital technologies

## Smart Sustainable City

an innovative city that uses Information and Communication Technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social and environmental as well as cultural aspects. (ITU, 2014)



| Country      | Brownfield Initiative                  | Greenfield Initiative                        |
|--------------|--|--|
| Algeria      | Algiers Smart City                     | Cyberpark City of Sidi Abdellah              |
| Bahrain      | Manama                                 | -  |
| Djibouti     | -                                      | Iroley Smart City (in planning stage)        |
| Egypt        | -                                      | New Capital (unnamed yet)                    |
| Jordan       | Amman Smart City                       | -  |
| Kuwait       | Kuwait City                            | South Saad Al Abdullah City                  |
| Lebanon      | -                                      | BeitMisk Village                             |
| Morocco      | Rabat City; Casablanca                 | Tangier Tech City; BenGuerir                 |
| Oman         | -                                      | Muscat                                       |
| Palestine    | Ramallah City                          | Rawabi City                                  |
| Qatar        | Doha City                              | Lusail City                                  |
| Saudi Arabia | Riyadh City; Jeddah City; Al-Ahsa City | King Abdullah Economic City; Neom Smart City |
| Syria        | -                                      | Marota City (near Damascus city)             |
| Tunisia      | Tunis Smart City                       | Tunisia Economic City (in planning stage)    |
| UAE          | Dubai City; Abu Dhabi City             | Masdar City; Dubai Silicon Oasis             |

# Innovation in the Arab Public Institutions

## Innovation

different kind of **initiatives** are taking place by Arab governments to boost innovation in their public sector institutions.



## UN-ESCWA

Established the **Arab Open and Innovation Government Portal (AOIGP)** to collect and document all available Arab case studies related to the Arab open government and innovation in Arab public institutions.

<https://opengov.unescwa.org/>

The 2023 GII Index Ranking of Arab countries covered by the GII 2023 Report

| Country      | Overall GII | Institutions | Human capital & research | Infrastructure | Knowledge & technology outputs | Creative outputs |
|--------------|-------------|--------------|--------------------------|----------------|--------------------------------|------------------|
| UAE          | 32          | 10           | 16                       | 15             | 59                             | 50               |
| Saudi Arabia | 48          | 45           | 35                       | 48             | 68                             | 66               |
| Qatar        | 50          | 23           | 54                       | 39             | 82                             | 65               |
| Kuwait       | 64          | 86           | 55                       | 46             | 73                             | 64               |
| Bahrain      | 67          | 28           | 77                       | 37             | 74                             | 98               |
| Oman         | 69          | 62           | 52                       | 61             | 75                             | 79               |
| Morocco      | 70          | 83           | 86                       | 94             | 65                             | 55               |
| Jordan       | 71          | 51           | 82                       | 87             | 76                             | 75               |
| Tunisia      | 79          | 107          | 46                       | 89             | 50                             | 72               |
| Egypt        | 86          | 103          | 95                       | 90             | 77                             | 73               |
| Lebanon      | 92          | 125          | 72                       | 96             | 86                             | 96               |
| Algeria      | 119         | 97           | 113                      | 102            | 128                            | 107              |
| Mauritania   | 127         | 89           | 119                      | 124            | 115                            | 131              |

# Innovation in the Arab Public Institutions - Examples

## Saudi Arabia

### Seha Virtual Hospital:

- Launched in 2021 by Ministry of Health.
- Virtual hospital that uses advanced telehealth technologies.
- Provide virtual health consultation for critical/urgent care.
- Provide virtual medical services, virtual specialized clinics, virtual multidisciplinary committees.

## Lebanon

### Integrated Solid Waste Management System:

- Launched in 2020 by the Ministry of State for Administration Development.
- Software tool to allow municipalities' officials and public to calculate cost of numerous waste management activities
- Activities include collection, sorting, sweeping, composting, etc.
- aiming at enhancing the solid waste management and planning throughout Lebanon

## Oman

### Antakhib ("I Vote") :

- Launched in 2023 by the Ministry of Interior.
- Used as the only official way for voting in the elections of the 2023 elections of the Municipal Council and Shura Council.
- The application is a biometric-based digital ID app.
- aiming at using trusted, secure technologies for a better and easy election process and to effectively promote the political participation of citizens.
- Usable by Omanis reside inside and outside the Sultanate



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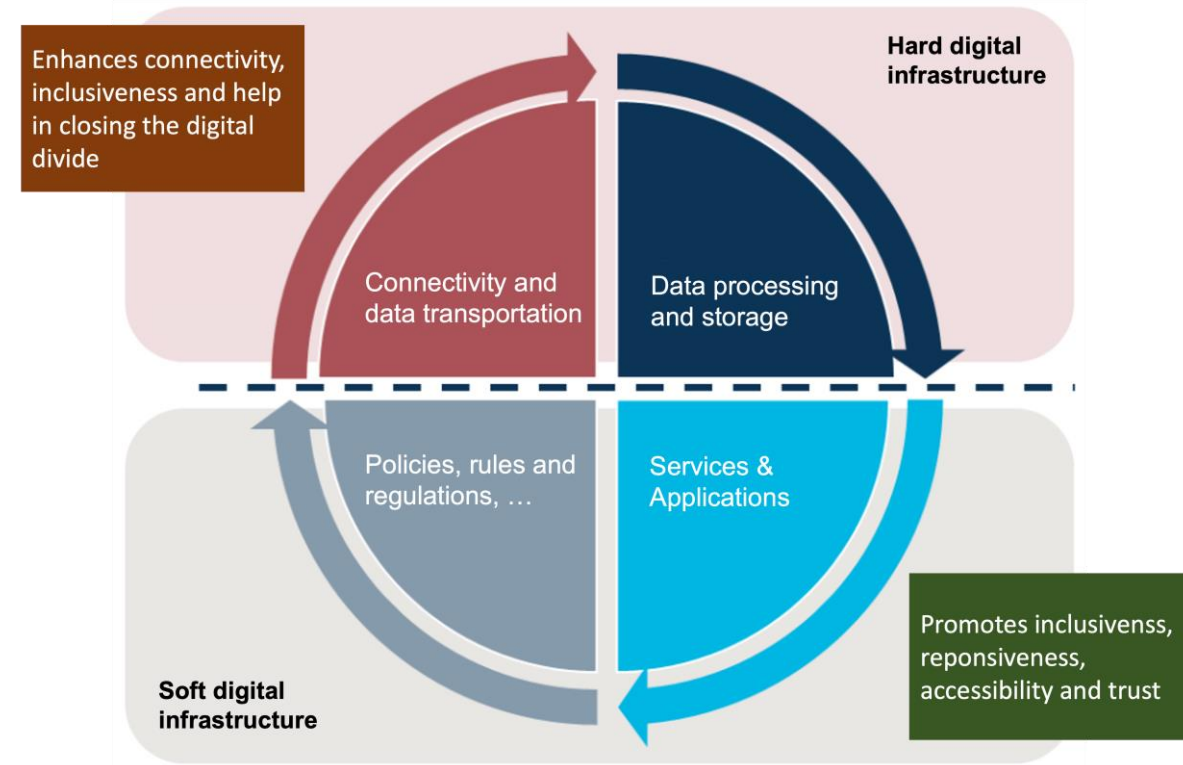


## Chapter 3

# Enhancing digital connectivity, accessibility and trust through coherent digital platform in Arab public institutions

# Digital Public Infrastructure (DPI)

- Enhancing the **digital connectivity** and **accessibility** of the Arab public institutions requires a series of improvements at different levels, which is achievable through:
  - Strong, well-designed physical infrastructure,
  - Revisit existing related policies and legislations or issuing new ones,
  - Use of trusted digital and emerging technologies to deliver effective public services,
  - Make public services available and usable by any person,
  - Ensure inclusiveness by reducing the digital divide, including the gender one, ... etc.
- In this study, the term “**Digital Platform**” refers to the public digital platform that provides different types of digital solutions.
- One main component of this platform is the **DPI**, which includes the “**Hard**” and “**Soft**” Digital Infrastructures.

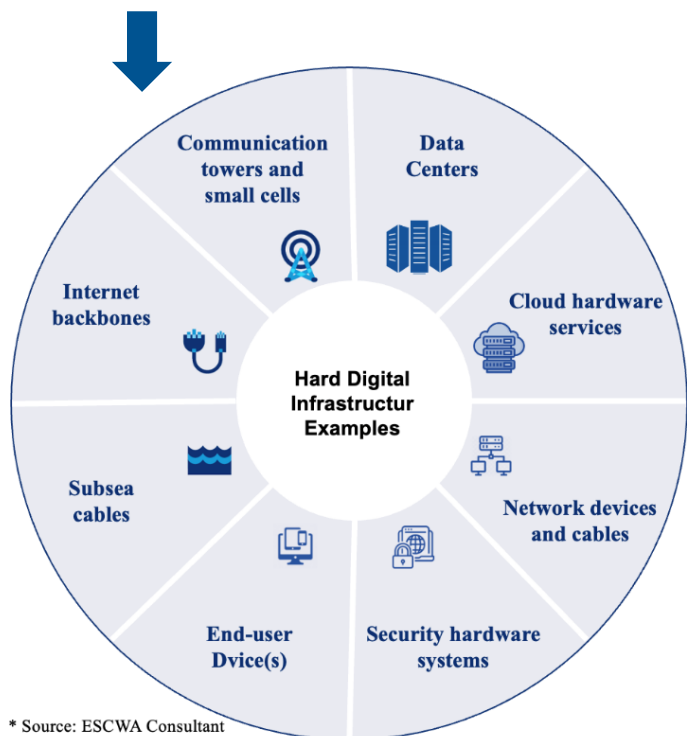


Source: ESCWA Consultant

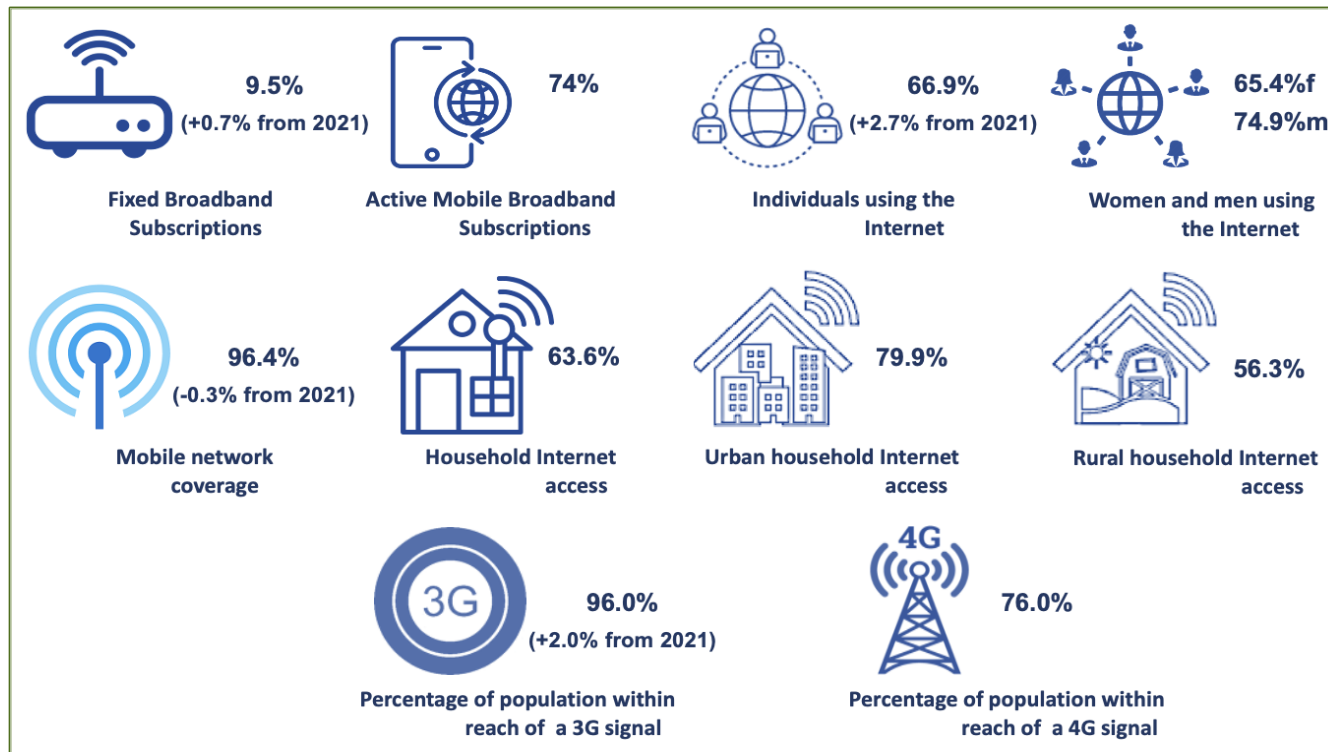
# Enhancing connectivity, accessibility and trust through Hard Digital Infrastructure

## Hard Digital Infrastructure

the **physical digital assets, structures and facilities** that are required to run the digital sphere of the nation including the public sector institutions that are used to transport and manipulate data and deliver services to the public.



\* Source: ESCWA Consultant

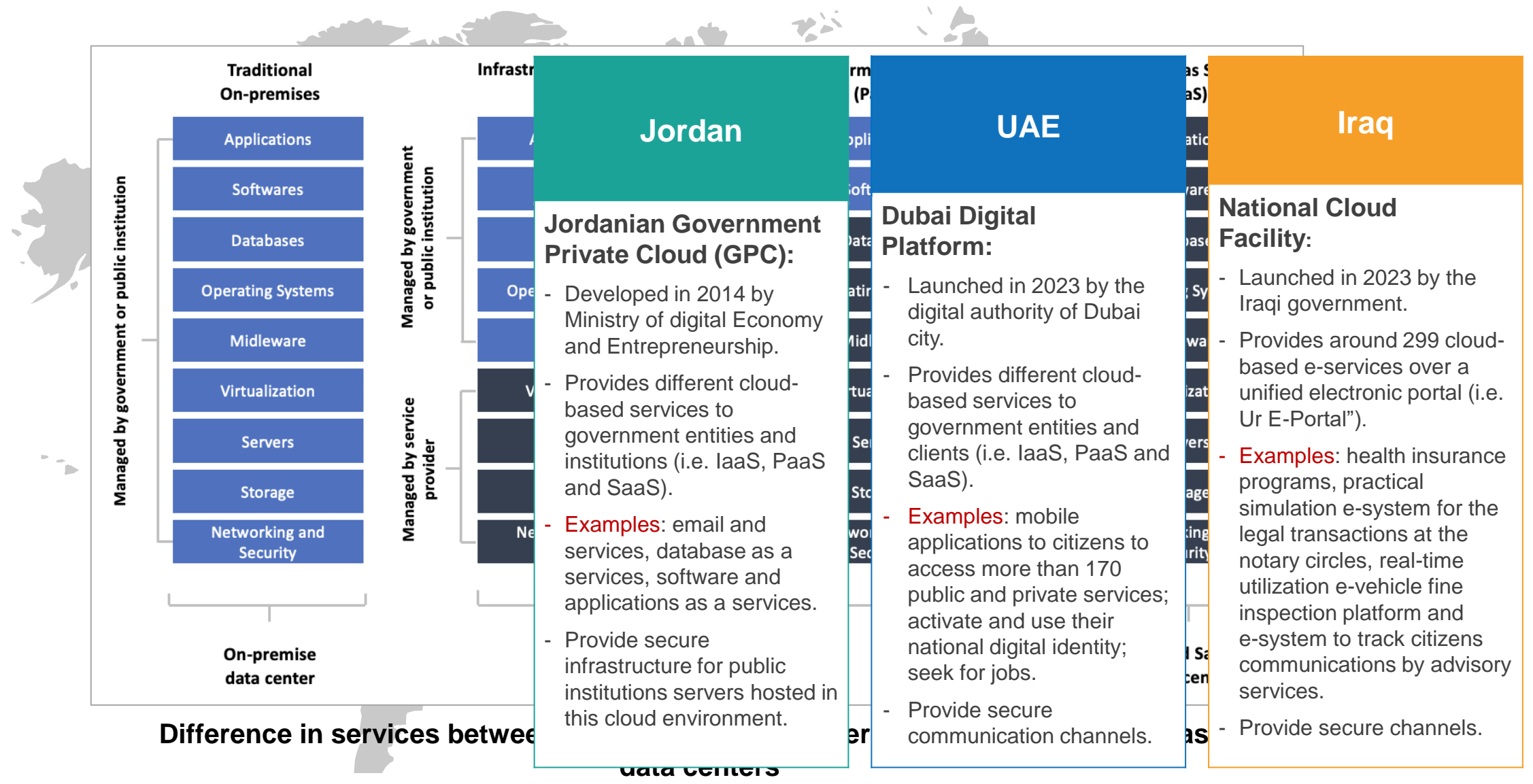


Source: compiled by the ESCWA consultant from the ITU statistics datahub, 2023.

## The 2022 Arab countries hard digital infrastructure indicators (per 100 habitants and per cent) of the ICT Development Index (IDI)

- **Statistics of the region** shows that although parts of the Arab countries are **very advanced** in relation to the hard digital infrastructure connectivity with the Internet and other telecommunication techniques, many others are still suffering from **myriad** challenges.

# Hard Digital Infrastructure: Data Centers and Cloud Computing in Arab Countries





# Enhancing connectivity, accessibility and trust through Soft Digital Infrastructure

## Soft Digital Infrastructure

consists of the **intangible elements** that are prerequisite for the use of all digital physical parties, allowing them to communicate and operate through **rules, regulations, legislations, policies, strategies, standards, software application** (i.e. developed using AI, blockchain, robots, big data) ... etc.



Although the hard infrastructure enhances the **connectivity** and **inclusiveness** of the digital platform of the public institutions and help in closing the **digital divide**, the robust soft infrastructure promotes **responsiveness, inclusiveness, accessibility** and **trust**.

**Hard** and **soft** digital infrastructures are strongly **interdependent**.

## Cyberlaws of e-Transactions, e-Payment, e-Signature , e-Commerce and Consumer Protection Laws, in Arab Countries (**Sample**)

| Country   | e-Transactions                  | e-Payment                               | e-Signature                                  | e-Commerce & consumer protection                |
|-----------|---------------------------------|---|--|---|
| Algeria   | By law 18-05/2018 of e-commerce | Law No 23-09/2023                       | Article 323 of Civil code and Law 15-04/2015 | By laws 09-03/2009 and 18-05/2018 of e-commerce |
| Bahrain   | Legislative Decree No 54/2018   | Decree No 54/2018 and decree no 55/2018 | Decision No 36/2018                          | Law No 35/2012 and Decree No 54/2018            |
| Palestine | Act 15/2017                     | Law No 11/2023                          | Act 15/2017                                  | Draft   |
| Somalia   | Mobile money regulations 2019   | n\                                      | n\   | n\  |
| Yemen     | Law No 40/2006                  | Law No 40/2006                          | Law No 40/2006                               | n\  |

## Cyberlaws of Cybercrime and Data Protection and Privacy in Arab Countries (**Sample**)

| Country   | Cybercrime   | Data Protection and Privacy  |
|-----------|--|--|
| Algeria   | Law No 09-04/2009 (special rules related to the prevention and fight against offenses linked to ICT) | Law No 18-07/2018 (protection of individuals in the processing of personal data) |
| Bahrain   | Legislative Decree No 28/2002 with respect to e-Transactions and Law No 60/2014 about ICT crimes     | Law No 30/2018 with respect to Personal Data Protection                          |
| Palestine | Law 10/2018  | Cabinet Decision No 03/2019  |
| Somalia   | n\   | n\   |
| Yemen     | Bill – Law on Combating e-Crime  | Law No 13/2012 on right of Access to Information                                 |

# Soft Digital Infrastructure: Emerging Technologies Polices & Regulations in Arab Countries

## Cloud Computing

### Policies:

- **Bahrain:** Bahrain government issued in 2017 the “Cloud First Policy”.
- **Saudi Arabia:** Saudi government issued in 2020 the “KSA Cloud First Policy”.

### Regulations:

- **Bahrain:** in 2018 started to implement the legislative-Decree No. 56/2018 on the Cloud Computing Services to Foreign Parties.
- **Saudi Arabia:** issued the Cloud Computing Services Provisioning Regulation No. 4/2023 based on the Cloud Computing Regulatory Framework versions of 2018, 2019 and 2020.
- **Egypt:** in 2021 approved a regulatory framework for establishing data centers, including cloud computing services.

## Artificial Intelligence

### AI Strategies:

- **Egypt:** in 2021, government approved the “National AI Strategy”.
- **Jordan:** in 2020, government approved the “Jordan AI Policy”.
- **Qatar:** in 2019, government released the “National AI Strategy”.
- **Oman:** in 2019, government launched the “Omani AI Strategy”.
- **Palestine:** in 2023, the Palestinian Council of Ministers approved the “National Strategy and Policy of the AI”.
- **Saudi Arabia:** in 2020, government announced the “National Strategy for Data and AI”.
- **UAE:** UAE cabinet adopted the “National AI Strategy 2031” and the UAE government launched the “Block chain strategy 2021” in 2018.



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## Chapter 4

# Emerging technology and innovation trends in the Arab public institutions

# Best Practices from the Arab Public Institutions: Artificial Intelligence (AI)



| Country      | Global Rank | Total Score | Government Pillar | Technical Sector | Government Pillar | Technical Sector |
|--------------|-------------|-------------|-------------------|------------------|-------------------|------------------|
| UAE          | 18          | 70.42       | 78.32             | 56.67            |                   |                  |
| Saudi Arabia | 29          | 67.04       | 78.71             | 49.59            |                   |                  |
| Qatar        | 34          | 63.59       | 69.64             | 44.31            |                   |                  |
| Oman         | 50          | 58.94       | 69.35             | 37.71            |                   |                  |
| Jordan       | 55          | 56.85       | 67.56             | 40.62            |                   |                  |
| Bahrain      | 56          | 56.13       | 57.96             | 39.24            |                   |                  |
| Egypt        | 62          | 52.69       | 68.19             | 40.11            |                   |                  |
| Kuwait       | 69          | 49.86       | 38.14             | 40.58            |                   |                  |
| Lebanon      | 76          | 47.62       | 50.56             | 36.99            |                   |                  |
| Tunisia      | 81          | 46.07       | 48.31             | 38.47            |                   |                  |
| Morocco      | 88          | 43.34       | 37.54             | 35.69            | 56.79             |                  |
| Algeria      | 120         | 35.99       | 30.10             | 30.56            | 47.30             |                  |
| Iraq         | 133         | 33.40       | 28.86             | 29.07            |                   |                  |
| Palestine    | 134         | 33.14       | 21.15             | 31.90            |                   |                  |
| Djibouti     | 155         | 29.95       | 19.43             | 29.50            |                   |                  |
| Mauritania   | 168         | 27.09       | 22.21             | 22.27            |                   |                  |
| Libya        | 173         | 25.31       | 10.02             | 28.10            |                   |                  |
| Sudan        | 177         | 24.51       | 15.42             | 23.35            |                   |                  |
| Comoros      | 181         | 22.62       | 15.87             | 20.66            |                   |                  |
| Somalia      | 183         | 21.98       | 18.01             | 19.35            |                   |                  |
| Yemen        | 188         | 19.89       | 19.59             | 30.94            |                   |                  |
| Syrian       | 192         | 18.12       | 13.67             | 28.13            |                   |                  |

## Kuwait

- AI healthcare:**
- AI-based Olympus device for surgeries.
  - Adopted by the government hospital, Jaber Al-Ahmad Al-Sabah.
  - Use AI to conduct an endoscopic operations to pinpoint tumors within stomach and colon.

## Tunisia

- AI Auditor:**
- AI-based auditor.
  - Adopted by the Ministry of Finance.
  - Enhancing the accountability and transparency in the government's tax collection system and increase trust of Tunisian taxpayers.

## UAE

- U-Ask (ask.u.ae):**
- A unified ChatGPT AI-powered chatbot platform.
  - Launched by the UAE government.
  - Designed to respond to citizens queries relating to public services.

## Morocco

- AI Center of Excellence:**
- Established by the Moroccan government.
  - To spur innovation in AI, foster the emergence of Moroccan expertise in AI and facilitate knowledge sharing.

# Best Practices from the Arab Public Institutions: Big Data Applications

## Arab Region

**Big data** could help in **decisions** related to government operations, education, healthcare, agriculture, social services, cultural development, management of energy, water and waste, ... etc.



Although **some** Arab governments have made **headway engagement** with big data technologies, others are still in the **early stages** of understanding the applications and dynamics of big data in the context of governments, businesses and academia.

## UAE

### Big Data initiatives:

- In 2022, launched officially the UN platform of “**Big Data for Sustainable Development**”.
- Country became the UN regional hub and headquarter for the platform.
- In 2022, government launched the “**Driving Data for Good**” initiative in collaboration with Meta.
- To support the government, through the employment of big data, to design public services, initiatives and projects that meet the citizens’ needs.

## Jordan

### Food Safety Project:

- Launched in 2021 by the Jordan Food & Drug Administration (JFDA).
- To reduce food waste and identify potential food safety risks.
- The outcomes showed that around 20% of the food waste was reduced.

## Lebanon

### Wheat production:

- Launched in 2019 by the Lebanese Agriculture Research Institution.
- To improve wheat production in Lebanon
- Wheat yields were increased by 15%

# Best Practices from the Arab Public Institutions: Immersive and Blockchain Technologies

## Immersive Technologies (AR, VR and Metaverse)

- Immersive technologies can help in Arab community planning, education, healthcare, ... etc.
- In 2023, the **National Museum of Qatar**, in collaboration with Microsoft, developed the **NMoQ Explorer** to enhance tourism sector.
  - It was designed to reflect the immersive interactive of the museum, allowing users to have interconnected experience, transitioning seamlessly between time, space and objects.
- In 2020, the **Moroccan government** supported the establishment of the first **Interactive Digital Center** in Morocco.
  - The center is designed to provide trainings on immersive technologies and to provide technology-forward solutions to government, academia and industrial sector.

## Blockchain Technologies

- Blockchain technology can be used for many purposes, from enhancing the voting process up to making public services more secure and run smoother.
- In 2017, the **Omani government** established the **FronTech** as a government company that focuses on deploying integrated solutions that are based on blockchain and other frontier technologies.
  - The company provided blockchain-based solutions to various organizations such as the Ministry of Health.
- In 2023, the **Egyptian government** launched a blockchain-based **Advanced Cargo Information** system.
  - It was implemented across all ports. It enables all stakeholders to monitor any risk that might affect the security of the country or the Egyptian citizens

# Best Practices from the Arab Public Institutions: Geospatial Technologies

- **Geospatial technologies** refer to the tools and methodologies relating to collecting, processing, managing and analyzing data related to the **Earth** and **human societies**.
- They can be used by **public institutions** to enhance their public services, detect and respond to emergency cases; manage existing infrastructure and building assets; ... etc.
- In **Arab countries**, governments are still at **early stages** of using and benefiting from the geospatial technologies.
- However; there are **promising initiatives** from the region.

## Tunisia

### Beni Khaled municipality initiative:

- Implemented the GIS technology at the local level.
- With the purpose of enhancing residents' services, improving communication with the public and providing support to decision-makers.
- Municipality staff used a cloud-based software to visualize and analyze data, create maps on web and share stories.
- Also offered citizens with a mobile app that allow them to report to the municipality incidents related to roads and waste using an interactive maps on real-time.
- This resulted in reducing incidents' response time and improve transparency by enabling the citizens to participate and engaged in the municipality daily management process.

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# Thank You



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# Policies and best practices for leveraging the use of emerging technology and innovation in the development of stronger Arab public institutions

## - RECOMMENDATIONS -



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## Policy Recommendations

- Integrate emerging technologies in Arab governments policies and strategies.
- Design responsive, inclusive, trustworthy and effective technological and innovation policies and strategies
- **Overcome the lack of legal frameworks:** to cover all aspects needed to the adoption of emerging technologies and innovation in Arab public institutions.
- Consider the ethical dimensions of AI and other advanced technologies.
- **Develop national related policies:** to regulate the use of emerging technologies, especially AI technologies, within Arab public institutions

## Policy Recommendations

- **Foster innovation in Arab public institutions:** decision and policy makers need to acknowledge the importance of innovation to enhance public operations and services, including related innovation policies and strategies.
- **Support excellence of public services through social innovation:** follow a human-centered innovation approach to encouraging citizens to get involved in public processes, aiming to address complex social challenges.
- **Foster investment in hard digital infrastructure:** especially in rural and remote hard-to-reach areas, to ensure delivery of public services. This is achievable through a coherent combination of public policies and PPP.

## Practical Recommendations

- Follow user-centric design principles.
- **Promote inclusive access to Arab public operations and services:** have to be available to and accessible by all, especially for the most marginalized and vulnerable individuals and groups in Arab societies. This includes the efforts needed to close the digital divide.
- **Invest in Arab public sector technological capabilities and skills:** with a focus on both Hard and Soft infrastructure.
- Raise awareness about the necessity and impact of using emerging technologies in Arab public institutions.
- Establish partnerships with external stakeholders and train existing staff.

## Practical Recommendations

- **Establish public sector innovation platform:** to create collaboration channels with the society, encouraging citizens to share their insights, requests, needs and innovative ideas and solutions on new or delivered public services. This would boost transparency and trust.
- Build a national data center with enabled cloud computing resources for emerging technologies-based innovation and R&D.
- Strengthen the public sector capabilities and capacities for scaling and implementation of DPI
- **Ensure continuous improvements:** in the public services offerings according to the dynamic nature of the digital landscape. Public institutions need to be urged to adapt to changing technologies, citizen expectations & emerging threats

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# Smart Sustainable Cities and the use of ICT and digital technologies

## Smart Sustainable City initiatives in Arab Countries

| Country      | Brownfield Initiative         | Greenfield Initiative                           |
|--------------|-------------------------------|---|
| Algeria      | Algiers Smart City            | Cyberpark City of Sidi Abdellah                 |
| Bahrain      | Manama                        | -   |
| Djibouti     | -                             | Iroley Smart City (in planning stage)           |
| Egypt        | -                             | New Capital (unnamed yet)                       |
| Jordan       | Amman Smart City              | -   |
| Kuwait       | Kuwait City                   | South Saad Al Abdullah City                     |
| Lebanon      | -                             | BeitMisk Village                                |
| Morocco      | Rabat City;<br>Casablanca     | Tangier Tech City;<br>BenGuerir                 |
| Oman         | -                             | Muscat  |
| Palestine    | Ramallah City                 | Rawabi City                                     |
| Qatar        | Doha City                     | Lusail City                                     |
| Saudi Arabia | Riyadh City;<br>Jeddah City   | King Abdullah Economic City;<br>Neom Smart City |
| Syria        | -                             | Marota City (near Damascus city)                |
| Tunisia      | Tunis Smart City              | Tunisia Economic City (in planning phase)       |
| UAE          | Dubai City;<br>Abu Dhabi City | Masdar City; Dubai Silicon Oasis                |

## Rank of Arab countries in IMD Smart City Index, 2019 - 2023

| Country      | Country HDI | City      | City HDI | Smart City Ranking |      |      |      | Rank Change 2021 - 2023 |
|--------------|-------------|-----------|----------|--------------------|------|------|------|-------------------------|
|              |             |           |          | 2019               | 2020 | 2021 | 2023 |                         |
| Algeria      | 0.745       | Algiers   | 0.767    | -                  | -    | -    | 123  | NEW                     |
| Egypt        | 0.731       | Cairo     | 0.779    | 96                 | 100  | 105  | 108  | ▽ -3                    |
| Jordan       | 0.72        | Amman     | 0.737    | -                  | -    | -    | 135  | NEW                     |
| Lebanon      | 0.706       | Beirut    | 0.677    | -                  | -    | -    | 139  | NEW                     |
| Morocco      | 0.683       | Rabat     | 0.702    | 99                 | 101  | 109  | 126  | ▽ -17                   |
| Oman         | 0.816       | Muscat    | 0.816    | -                  | -    | -    | 96   | NEW                     |
| Palestine    | -           | -         | -        | -                  | -    | -    | -    | -                       |
| Qatar        | 0.855       | Doha      | 0.855    | -                  | -    | -    | 59   | NEW                     |
| Saudi Arabia | 0.875       | Jeddah    | 0.871    | -                  | -    | -    | 56   | NEW                     |
|              | 0.875       | Mecca     | 0.871    | -                  | -    | -    | 52   | NEW                     |
|              | 0.875       | Medina    | 0.871    | -                  | -    | 79   | 85   | ▽ -6                    |
|              | 0.875       | Riyadh    | 0.9      | 55                 | 44   | 39   | 30   | △ 9                     |
| Tunisia      | 0.731       | Tunis     | 0.775    | -                  | -    | -    | 137  | NEW                     |
| UAE          | 0.911       | Abu Dhabi | 0.911    | 16                 | 14   | 12   | 13   | ▽ -1                    |
|              | 0.911       | Dubai     | 0.911    | 13                 | 19   | 14   | 17   | ▽ -3                    |