

Leveraging emerging technology and innovation for Enhancing Arab public institutions

Emerging Technology and Innovation for Arab Public Institutions - Launch of ENACT Reports

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Shared Prosperity **Dignified Life**



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Outline



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- Public Sector Institutions
- Technology and Innovation to enhance RITE Principles in Public Sector



Technology and Innovation in Arab Public Institutions

- Status of e-government and innovation in Arab Countries
- Smart Sustainable Cities and the use of ICT and digital technologies



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

- Digital public infrastructure (DPI)
- Hard and Soft digital infrastructures



Emerging technologies & innovation trends in Arab Public Institutions

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



Recommendations

- Regional level
- Categories level

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**.



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

- **Technology and Innovation** have a great impact on realizing the **RITE** principles in public institutions.
- **Technology and Innovation** has also the power to facilitate the **achievement** of most of the SDGs, including SDGs 9, 16 and 17.

Technology and Innovation in public institutions

can help in developing operations and services that are based on citizen's needs and to enhance their quality of life (i.e. **responsiveness & effectiveness**), designed to meet the needs of all society's segments (i.e. **inclusiveness and effectiveness**) and use innovative solutions to secure data and systems and to detect frauds and hacking attempts (i.e. **trustworthiness**).

(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.



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Technology and Innovation in Public Institutions

Status of e-government and Innovation in Arab Countries

Sample of the e-Government Development Index (EGDI) rank Arab Governments

| Country name | E-gov rank 2024 | EGDI 2024 | GEMS rank 2023 |
|----------------------|-----------------|-----------|----------------|
| Saudi Arabia | 6 | 0.96 | 1 |
| United Arab Emirates | 11 | 0.953 | 2 |
| Bahrain | 18 | 0.92 | 7 |
| Oman | 41 | 0.858 | 4 |
| Qatar | 53 | 0.824 | 3 |
| Kuwait | 66 | 0.781 | 6 |
| Tunisia | 87 | 0.694 | 10 |
| Jordan | 89 | 0.685 | 5 |
| Morocco | 90 | 0.684 | 8 |
| Egypt | 95 | 0.67 | - |
| Algeria | 116 | 0.596 | 9 |
| State of Palestine | -- | -- | 11 |

The 2023 Global Innovation Index (GII) ranking of Arab countries

| Country | Overall GI | Institutions | Human capital and research | Infrastructure | Knowledge and technology outputs | Creative outputs |
|----------------------|------------|--------------|----------------------------|----------------|----------------------------------|------------------|
| United Arab Emirates | 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 |

Smart Sustainable Cities and the use of ICT and digital technologies

Samples of the Smart Sustainable Cities initiatives in the Arab region

| Country | Brownfield Initiative | Greenfield Initiative |
|--------------|----------------------------|---|
| Algeria | Algiers Smart City | Cyberpark City of Sidi Abdellah |
| Bahrain | Manama | - |
| 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 |
| Oman | - | Muscat |
| Palestine | Ramallah City | Rawabi City |
| Qatar | Doha City | Lusail City |
| Saudi Arabia | Riyadh 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 |



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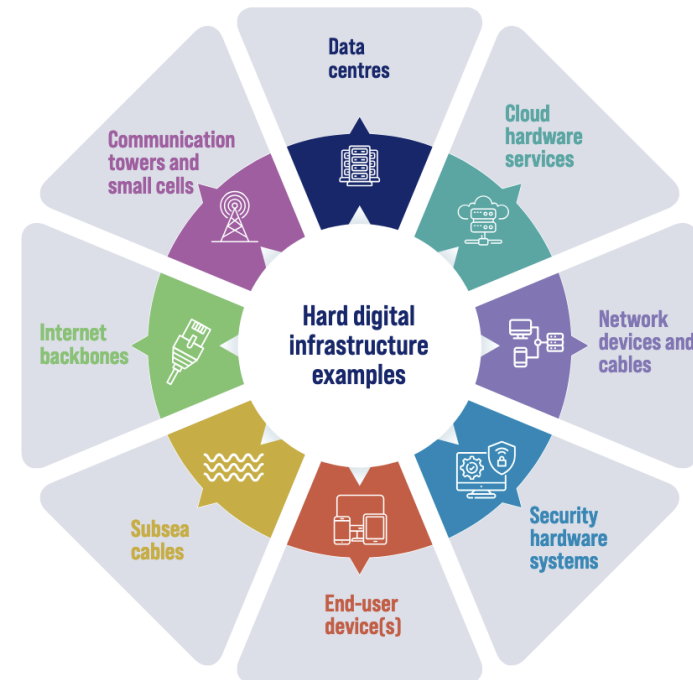
Enhancing digital connectivity, accessibility and trust through coherent digital platforms in public institutions

Digital Public Infrastructure (DPI)

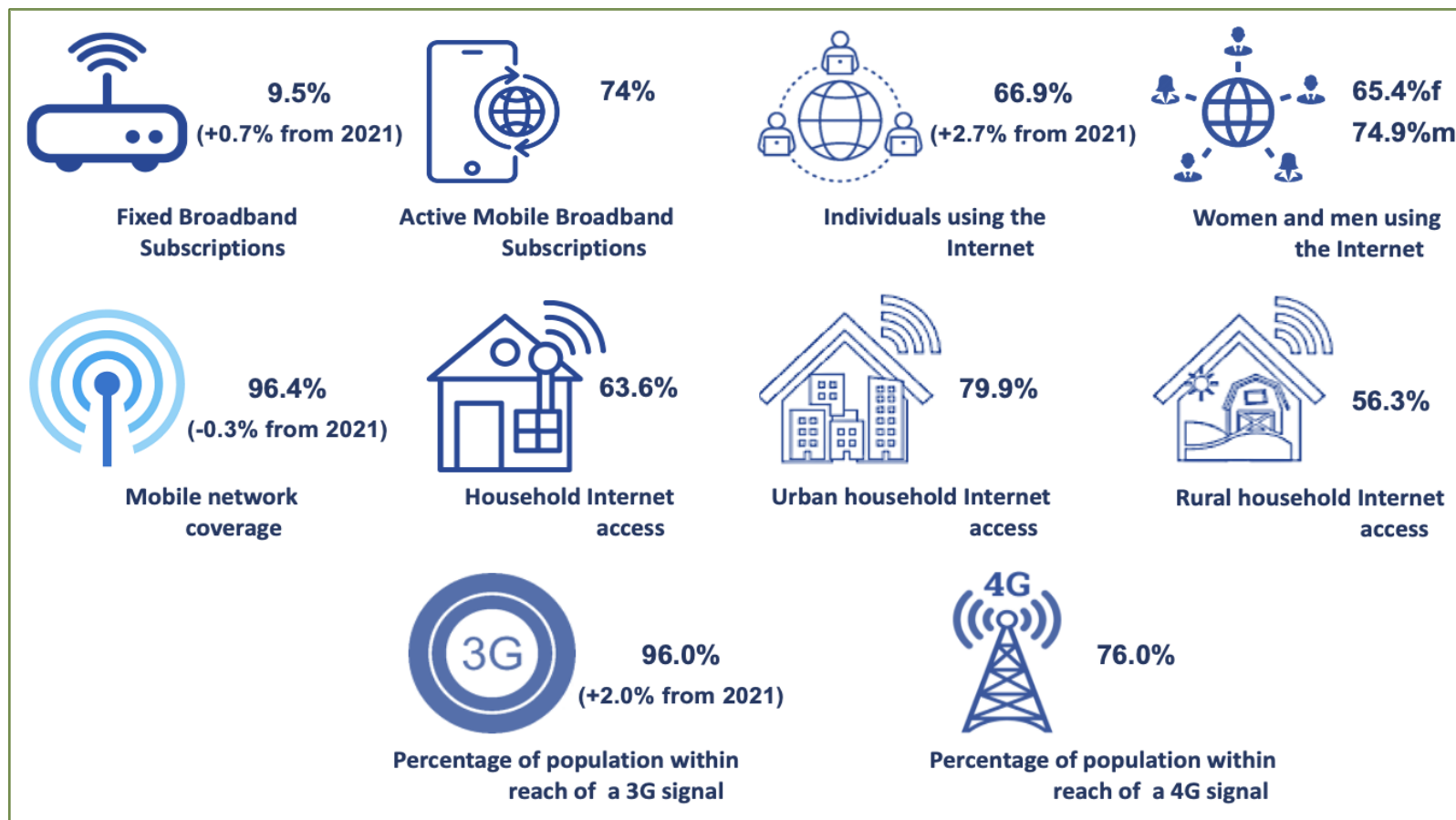
- In this study, the term “**Digital Platform**” refers to the public digital platform that provides different types of digital solutions.
- One main component of this platform is the **DPI**, which includes both, the “**Hard**” and “**Soft**” Digital Infrastructures.

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.



Enhancing connectivity, accessibility and trust through Hard Digital Infrastructure



The 2022 Arab countries hard digital infrastructure indicators (per 100 inhabitants 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.

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.
- It allows physical parties to communicate and operate through:
 - Rules and regulations,
 - legislations,
 - policies,
 - strategies,
 - etc.

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 |
| Palestine | Act 15/2017 | Law No 11/2023 | Act 15/2017 | Draft |
| Somalia | Mobile money regulations 2019 | National payment system, 2021 | n\ | 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) |
| Palestine | Law No. 10/2018 | Cabinet Decision No 03/2019 |
| Somalia | n\ | n\ |



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Emerging technology and innovation trends in public institutions

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

Sample of the 2023 Government AI Readiness Index of Arab Governments

| Country | Global rank | Total score |
|----------------------|-------------|-------------|
| United Arab Emirates | 18 | 70.42 |
| Saudi Arabia | 29 | 67.04 |
| Qatar | 34 | 63.59 |
| Oman | 50 | 58.94 |
| Jordan | 55 | 56.85 |
| Bahrain | 56 | 56.13 |
| Egypt | 62 | 52.69 |
| Kuwait | 69 | 49.86 |
| Lebanon | 76 | 47.62 |
| Tunisia | 81 | 46.07 |
| Morocco | 88 | 43.34 |
| Algeria | 120 | 35.99 |
| Iraq | 133 | 33.40 |
| State of Palestine | 134 | 33.14 |

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.

Best Practices from the Arab Public Institutions: Big Data and Immersive Technologies

Big Data

- **Big data** could help in **decisions** related to government services such as education, healthcare and management of energy, ... etc.
- In 2021, the **Jordan Food & Drug Administration**, launched the **Food Safety project** to reduce food waste and identify potential food safety risks.
 - The outcomes showed that around 20% of the food waste was reduced.

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.

Best Practices from the Arab Public Institutions: Blockchain and Geospatial Technologies

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 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

Geospatial Technologies

- **Geospatial technologies** can be used to enhance public services, detect and respond to emergency cases, manage existing infrastructure and building assets, etc..
- The **GIS** technology used by **Beni Khaled municipality** to enhance residents' services and to allow the public to support the decision-makers.
 - Through a mobile app, Citizens were able to report to the municipality incidents related to roads and waste using an interactive maps on real-time, allowing citizens to participate in the municipality's daily management process.



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Recommendations

Recommendations Guide

- The suggested recommendations of this study are divided into **four categories**.
- Each category includes a list of Arab countries that are selected depending on the value of their 2024 EGDI Index.
 - The **First Group** includes all Arab countries with EGDI values above 0.7.
 - The **Second Group** includes all Arab countries with EGDI values between 0.5 and 0.69.
 - The **Third Group** includes all Arab countries with EGDI values between 0.3 and 0.49.
 - The **Fourth Group** includes all Arab countries with EGDI values below 0.29.
- **Palestine data** is not available in the EGDI Index, and its value has been approximated based on the 2023 GEMS Index.

First Group Countries (above 0.7)

- The UAE,
- Saudi Arabia
- Oman
- Bahrain
- Kuwait
- Qatar

Second Group Countries (between 0.5 and 0.69)

- Tunisia
- Jordan
- Morocco
- Egypt
- Palestine
- Algeria
- Lebanon

Third Group Countries (between 0.3 and 0.49)

- Iraq
- Syria
- Libya
- Mauritania

Fourth Group Countries (below 0.29)

- Sudan
- Yemen
- Djibouti
- Comoros
- Somalia

Regional Level

- Governments need to recognize the potential of DPI and embrace it as a tool for transformation.
- Follow user-centric design principles by incorporating them into the development of digital public services.
- **Formulate and adopt a regional AI Act aligned with international standards and best practices.**
- Government in the Arab region need to consider and address the ethical implications of utilizing digital and emerging technologies in public institutions
- Develop or update regional directives for legal and regulatory frameworks governing the use of emerging technologies.
- Design coherent, agreed-upon indexes and indicators to measure the status of each RITE principle in public institutions, tailored to the specific contexts of each country.
- Ensure robust cybersecurity measures by adopting policies and strategies consistent with the Arab Cybersecurity Strategy 2023-2027 to safeguard the use of digital and emerging technologies.

Recommendations: Policy and Practical Recommendations - First Group

First Group countries: The UAE, Saudi Arabia, Oman, Bahrain, Kuwait and Qatar – or Gulf Cooperation Council (GCC).

Policy Recommendations

- Strengthen data governance ecosystem in Arab public institutions.
- Foster innovation in public institutions.
- Support excellence of public services through social innovation.

Practical Recommendations

- Raise awareness about the critical impact of utilizing emerging technologies within public institutions.
- Establish public sector innovation platforms to support the development of comprehensive governance structures for public institutions.
- Ensure continuous improvement and monitor effectiveness and outcomes.

Recommendations: Policy and Practical Recommendations - Second Group

- **Second Group countries:** Tunisia, Jordan, Morocco, Egypt, Palestine, Algeria and Lebanon.
- Countries in the second group should also consider the recommendations for the first group.

Policy Recommendations

- **Integrate emerging technologies into government policies and strategies:** this will help shape comprehensive strategies and agendas.
- **Overcome the lack of legal frameworks:** to cover all aspects needed for the adoption of emerging technologies and innovation in Arab public institutions.
- **Develop national policies related to emerging technologies:** to promote, regulate, and advance the use of digital and emerging technologies, including the sharing and utilization of open data within public institutions.

Practical Recommendations

- Involve all stakeholders, including citizens, in digital transformation plans.
- Promote inclusive access to public operations and services.
- Invest in building and strengthening the technological capabilities and skill sets of the public sector.
- Establish partnerships with external stakeholders and train existing staff.

Recommendations: Policy and Practical Recommendations – Third and Fourth Groups

- **Third & Fourth Groups countries:** Syria, Iraq, Libya, Mauritania, Sudan, Yemen, Djibouti, Comoros and Somalia.
- Countries in the third and fourth groups should also consider the recommendations for the first and second groups.

Policy and Practical Recommendations

- **Encourage investment in hard digital Infrastructure:** Achieve this through public policies and strategic partnerships between public sector institutions and relevant private sector stakeholders.
- **Promote digital acceptance:** Arab governments, in both categories, need to actively advocate for the adoption of digital technologies as effective tools to deliver high-quality services to citizens.
- **Establish a digital technology and innovation Fund:** to ensure financial resources are available for building essential digital public infrastructure and enhancing the digital skills and capabilities of employees and citizens.
- **Develop a national data centre with cloud computing resources for emerging technology-based innovation and research and development:** to foster social innovation, social entrepreneurship and collaborative project management between public institutions and the private sector.

Thank You

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