UN-ESCWA
United Nations Economic and Social Commission for Western Asia

Jordan National Digital Development Review Report - 2019

Towards Empowering People and Ensuring Inclusiveness

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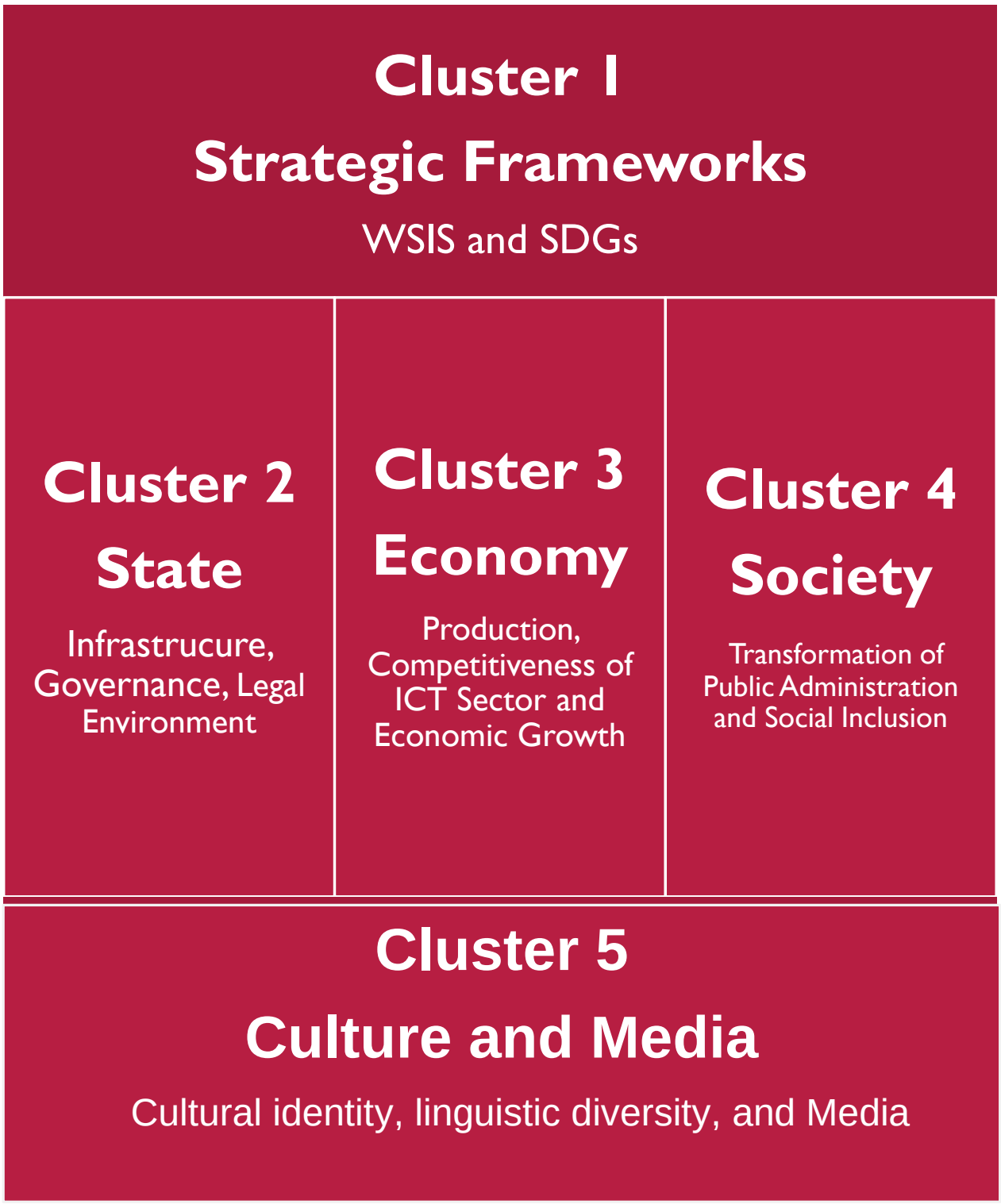
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I. Cluster One: National, Regional and International Strategic Frameworks

A. National digital strategies (The role of the government and all stakeholders (C1))

Overarching National Digital Strategy exists (like Digital Nation, Smart Nation, Digital Economy…etc.)	*Yes*
Name of the Strategy	*Jordan Vision 2025*[1]
Year of adoption and latest update	*2015*
Government agency in charge	*Prime Ministry* *رئاسة الوزراء*
Pace of implementation	*N/A*
Description of progress made (about 150 words)	It sets out a vision and associated road map for the country's economic and social future for a period of 10 years. The road map identifies key areas in which there is opportunity for Jordan to achieve its targets. These areas are economic growth, the rule of law, social development, and active citizenship, the pursuit of excellence, transparency, competitiveness and sustainability. The specific measures set out in Jordan 2025 are high-level, rather than ICT sector specific, but they do address issues that underpin the sector's development.
Sectoral (ICT):	*Yes*
ICT Sector strategy / plan exists	
Name of the strategy / plan	*General Policy for the Information & Communications Technology and Postal Sectors 2018*[2]
Year of adoption and latest update	*2018*
Government agency in charge	*Ministry of Information and Communications Technology* *وزارة الاتصالات وتكنولوجيا المعلومات*
Pace of implementation	*N/A*
Description of progress made (about 150 words)	It is intended to seize the opportunities of the Fourth Industrial Revolution aiming at the development of a digital economy leading to renewed economic development and increased income and wealth of individual Jordanians. The government is keen for Jordan to harness existing and emerging digital technologies for economic and social development, such technologies include but not limited to Artificial Intelligence (AI), Blockchain and the Internet of Things (IoT) provided by the Telecommunications, Information Technology and Postal sectors. The Policy aims to facilitate the use of such technologies in all sectors and to revitalize the Government's Digital Transformation Program by which it adopts digital technologies to improve the Government administration, the provision of government services and communication with citizens.

[1] http://www.pm.gov.jo/upload/files/Jordan2025-ar.pdf

[2] https://trc.gov.jo/EchoBusV3.0/SystemAssets/About%20TRC/014da924-b808-4372-b2a9-61a49d19e5eb_ICTP_Policy_2018.pdf

Other Sectors:	*Yes*
Digital Transformation strategy / plan exists (Digital Learning / Digital Health…etc.	
(Repeat this section – 5 rows – as required)	
Name of the strategy /Plan	*Digital Jordan Strategy*[3]
Year of adoption and latest update	*2018*
Government agency in charge	*Ministry of Information and Communications Technology* *وزارة الاتصالات وتكنولوجيا المعلومات*
Pace of implementation	*N/A*
Description of progress made (about 150 words)	It presents a three-year government plan (2018-2020) to increase the use of electronic services and to automate government procedures. It targets four main value chains that serve Jordanian citizens, the business sector, the residents in Jordan and government departments & institutions. It also identifies a schedule for the government departments to participate in an e-transformation plan. The Digital Jordan Strategy involves re-engineering and automation procedures of the services of a number of ministries and government departments in addition minimizing the use of paper by using technology solutions to reach "No paper government" by year 2020. The strategy also includes a revision of the Law on Public-Private Partnership that related to outsourcing procedures for the private sector.
Name of the strategy /Plan	*Reach 2025*[4]
Year of adoption and latest update	*2016*
Government agency in charge	*Ministry of Information and Communications Technology* *وزارة الاتصالات وتكنولوجيا المعلومات*
Pace of implementation	*N/A*
Description of progress made (about 150 words)	It was launched in 2016 aiming to establish a digital economy in Jordan that empowers people, sectors and businesses. The main objective of the initiatives is to raise productivity, ensure growth and prosperity and create a highly attractive business destination for investments and international partnerships. Although being not specific to the ICT sector, the strategy focuses on driving globally competitive and innovative digital solutions in Health, Education, Energy & Clean-tech, Finance, Transport, Communications and Security sectors. Reach 2025 identifies actions in key areas of concern for the ICT sector, notably developing talent and skills, promoting innovation and developing digital infrastructure. Given the big budget needed for the implementation of this strategy, only 15% of the activities have been implemented to date.

3 https://www.modee.gov.jo/EBV4.0/Root_Storage/EN/I/Jordan_Digital_Transformation_Strategy_2020_English_Unofficial_Translation.pdf

4 https://staging.jordan.gov.jo/wps/portal/Home/MediaCenter/OtherNews/NewsDetails_en/Shweikeh%20announces%20the%20drafting%20and%20formation%20of%20the%20REACH%202025%20initiative?lang=en

Name of the strategy /Plan	*Jordan Economic Growth Plan (JEGP) 2018-2022*[5]
Year of adoption and latest update	*2018*
Government agency in charge	*N/A*
Pace of implementation	*N/A*
Description of progress made (about 150 words)	It outlines the vision and policies pertaining to seven sectors, one of which is ICT. The JEGP is founded on Utilizing digital policies to promote the use of technology, adopting an open data policy and a security and information protection policy, Involving the private sector in the activation of the role of post offices and knowledge stations, stimulating investments in the ICT sector, Reducing the use of paper in government institutions towards a «paperless government» and Adopting the policy of digitizing Jordan/the government. Specific projects included in the JEGP are the development of a National Broadband Network and the automation/re-engineering of government services. JEGP also works towards the development of the educational curriculum to include gaming software, the promotion of post offices to provide e-services, the use of electronic signatures at all levels of administration and the encouragement of the adoption of 3D printing.

B. National Engagement in International and Regional Cooperation Initiatives (C11)

1. WSIS Follow-up

The Government of Jordan recognizes and works toward the achievement of its commitments set forth in international agreements to which Jordan is a signatory. This includes the general undertakings made as part of the World Summit on the Information Society (WSIS) Geneva and Tunis goals and plans and the U.N. SDGs.

To assess its contribution to the building of the information society and the achievement of WSIS goals the Government of Jordan continuously evaluates and assesses the magnitude of the digital divide, in both its domestic and international dimensions, and tracks its national versus regional and global progress in the use of ICTs. This is evident by conducting regular ICT diffusion and usage surveys and ICT impact studies in addition to a regular analysis of Jordan's ranking in the international information technology related reports. These surveys and studies provide statistical information on the Information Society, with basic ICT performance measurement indicators. The Government use these statistics to monitor progress regarding e-readiness of consumers and businesses. The Government, through the Ministry of Information and Communications Technology (MoICT), will review these statistics to identify areas for improvement. The collected statistics should, as far as practicable, include those that are commonly used by relevant international comparisons. The major indicators are published on MoICT website (www.moict.gov.jo).

Surveys and studies include[6]:

- Annual " ICT use in household survey", which is conducted as a result of an MoU signed between the MoICT and the Department of Statistics (DOS).
- Bi-annual " ICT use in enterprise survey" which is conducted as a result of an MoU signed between the MoICT and the Department of Statistics (DOS).
- Annual survey “ICT sector survey” to assess the development in the sector in terms of revenue, exports, employment and penetration rates in ICT companies operating in accordance with ISIC 4.0 economic activities.
- Assessment impact studies on the economic impact of ICT on the national economy in general and on selected economic issues such as taxes productivity,

[5] https://www.ssif.gov.jo/UploadFiles/JEGProgramEnglish.pdf

[6] http://moict.gov.jo/content/studies-and-reports

Telecommunications Regulatory Commission (TRC) also publishes on its website (www.trc.gov.jo) the major telecommunication indicators.

Yearly surveys are conducted to collect the main ICT indicators in the country. The surveys format is regularly updated based on the development in the sector taking into consideration the requirements of ICT4D and ICT4SDGs.

There are many regional projects for building the information society/digital economy with local components in Jordan, including, but not limited to, the following pilot projects.

1. **One million coder (expected launch date July 2019):** It aims at providing Jordan's youth with the basic skills and abilities which they will need to get future jobs in addition to teaching them the programming language through online training courses. The training program consists of three tracks that are the most sought-after in the field of software: the development of Android applications, data analysis, and developing web pages. (in progress)
2. **DOT Jordan's Digital Livelihood Programme (launched in 2017):** The programme is funded by the Global Affairs Canada (A Canadian government department) and is aligned with the Government's REACH 2025. DOT Jordan worked in coordination with MoICT to transform 5 knowledge stations into 'digital creativity labs' that utilize digital tools to promote innovation, research and solving pressing challenges faced by local communities, in addition to working in increasing the awareness of the use of e-government services.
3. **DOT (Incubators) (expected launch date July 2019)**: DOT Jordan will work in close collaboration with the MoICT and National Information Technology Center (NITC) in achieving the below:
    - The first Programme: Transforming 3 knowledge stations from training to incubators, where three business incubators will be established in each of the country's regions (North, South and middle). These incubators will serve as hubs to identify entrepreneurs in Jordan and to provide facilities and needed support for entrepreneurial growth.
    - The second program: Connecting youth from their communities to opportunities. This is through creating an online platform that connects supply to demand by providing highly qualified ICT graduates with the skills required by the private sector companies, including: data management, staff augmentation, e-commerce and web and social media services.
4. **Startup pitch: (expected launch date July 2019)** Networking between entrepreneurs in Jordan and Jordanian investors in the United Arab Emirates to adopt entrepreneurial ventures through strategic partnerships and financial and technical support. This initiative aims to:
    - Promote investment for entrepreneurs (owners of start-ups).
    - Opening regional and international markets in front of them.
5. **Women Economic Empowerment initiative: (expected lunch date May 2019):** In cooperation between The Arab Women Enterprise Fund Program (AWEF) and MoICT, this initiative aims at opening up the horizons of cooperation in the field of empowering families and women in Jordan and benefiting from the guidelines, services and data available, through:
    - Establishing a unit/team for women empowerment in MoICT and to develop an action plan for this unit to establish effective and sustainable market linkages between women and the IT sector as well as maintaining and updating the database of women participating in this initiative.
    - Recruitment of a short-term consultant by the AWEF to provide advice and recommendations to the staff of this unit.
    - Developing the skills of the employees of the Unit on the principles of economic empowerment and other skills.
    - Providing the staff with training and tools of M&E.

As in other countries with similar income levels, the differences between the availability of ICT devices in urban and rural households are significant. In all categories, except ordinary cell phones, rural households have a lower level of penetration. The lower level is particularly significant in fixed telephone availability and the availability of PCs, laptops and tablets. Again, this factor suggests that access to the internet outside the household is important for inclusion. Mobile phones and indeed smartphones are the device of choice. Broadband internet access is available in most areas of Jordan, though some rural locations that are more than about five kilometers from a local exchange may have some difficulty in receiving service.

Percentage of households that have services

Per region	kingdom	North	South	center
Internet penetration rate	88.8%	88.7%	88.1%	88.9%
Mobile Penetration rate	98.4%	98.8%	99%	98.2%
Computer penetration rate	38%	12.3%	10.1%	13.6%
Laptop penetration rate	32.8%	20.7%	24.3%	26.2%

Relative distribution of individual Internet users aged 5 years and over

Per gender	Male	Female
Internet penetration rate	53%	47%
Mobile Penetration rate	n/a	n/a
Smart phone penetration rate	n/a	n/a
Computer penetration rate	54%	46%
Laptop penetration rate	n/a	n/a

P**ercentage of households that have smart phone by regions**

Per region	Rural Areas	Urban Areas	The country
Smart phone penetration rate	87.7%	90.6%	90.3%

Capacity building and ICT literacy are crucial to build inclusive Information Society. The program E-government providing government employees a specialized training related to Microsoft, Cisco, Oracle technologies. In an effort to bridge the gap between the outcome of higher education institutions and the IT labour market needs, the ICT training academy is an umbrella that will include available programs offered by international training academies, universities, and local centres in an integrated network.

2. Other related Frameworks (other than WSIS)

17Jordan[7] is an independent brand launched through a partnership with the Good Capital Project and the United Nations Country Team in Jordan. 17Jordan provides a collaborative platform and network to leverage partnerships and attract long-term growth capital to SDG-enhancing investments.

Inspired by the 2030 Agenda for Sustainable Development and the Addis Ababa Action Agenda on Financing for Sustainable Development, 17Jordan champions a new approach to development financing for the SDGs and builds a local and global community of additive partners across finance, development and government entities who share investment and impact interest. The Canadian government, C-Change, Impact Alpha, the Jordan Investment Commission, Refugee Investment Network and Tent Foundation are initial examples of the partners. There is an objective to build upon this momentum to expand and accelerate collaborative resources needed to scale 17Jordan.

17Jordan organized a design session on the back-office and ICT sector. This session focused on opportunities for SDG-enhancing investments in the sector. Below a highlight of the discussion:

- The opportunity of peace in the region
- The opportunity for Jordan's youth
- The opportunity for Jordan's women
- The opportunity for a growing number of STEM-educated female graduates
- The opportunity for more Jordanians working from home
- The commitment and support from local government and ministries
- Leader in Arabic content

[7] www.17jordan.org

- The opportunity of the clarity of the Jordanian accent
- The opportunity in Jordan's time zone

II. Cluster Two: Infrastructure, Governance and Legal Environment Policy Areas

A. ICT Infrastructure (C2)

1. Market structure and regulatory landscape

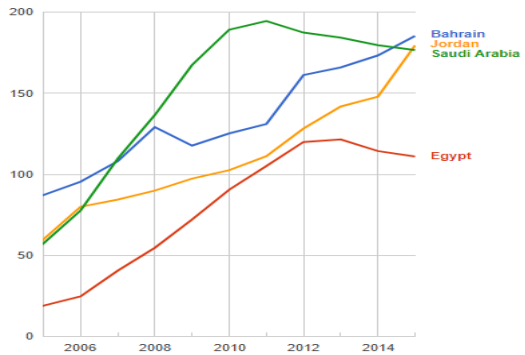
Article 3 of Telecommunications Law No. (13) of 1995 assigns to the MoICT the duty of preparing the general policy of the Telecommunications and Information Technology sectors in the Kingdom in addition to a biennial national strategic plan in accordance with the general policy.

Article 6 of the Telecommunications Law states the following regarding the obligations of the TRC: "To regulate telecommunications and information technology services in the Kingdom in accordance with the established general policy so as to ensure the provision of high quality telecommunications and information technology services to users with high standards and reasonable prices and which realizes the optimal performance of the telecommunications and information technology sectors."

The Policy for the Telecommunications, Information Technology and Postal Sectors 2018 sets the context within which the Telecommunications Regulatory Commission must operate in order to fulfill its role and responsibilities under the Telecommunications Law

Mobile service:

Mobile penetration in Jordan is one of the highest in the Arab countries and has grown rapidly in the last few years, in particular after the deployment of 4G/LTE by the three mobile operators in the market in 2015. The graph below illustrates just how quickly the mobile sector in Jordan has grown in comparison with other leading countries in the region.



Central to the performance of the mobile sector is competition, which is well-established and in keeping with leading markets elsewhere in the world. Zain, the first mobile service provider, has been established since 1994, (Orange/Jordan Telecom) launched service as the second mobile operator in 2000. The third operator, Umniah, was granted its license in 2005.

Zain secured a 4G license and launched their 4G LTE services in February 2015. Following Zain, Orange Jordan acquired the 4G license for (10+10) MHz frequencies on the 1800 MHz spectrum and started offering it services end of May 2015. Umniah subsequently acquired their 4G license.

In light of the above market development, mobile data consumption has grown quickly in Jordan, where smartphone penetration exceeds 90% and the use of these devices grows by around 7-10% annually.

Internet services:
Internet access has been available in Jordan for well over twenty years. The number of internet users in Jordan has risen consistently over the last fifteen years, albeit from a low base. In 2017, the internet penetration rate exceeded 100% of the population. The primary application of the Internet is to communicate with friends through social networking websites (93.2%), the lowest is the purchase or sale of goods and services (1.4%).

Telecom Service	Status of regulatory landscape	List all awarded telecom licenses
Mobile services	*competitive*	Zain, Orange, Umniah
Internet services	*competitive*	Orange internet,Mada VTEL,DAMAMAX, JEIS,,Al-Nai,TE-Data, Umniah

2. *ICT Infrastructure by Service Type*

Fixed and mobile telecommunications services are universally available as a consequence of a universal service obligation on Jordan Telecom and roll-out obligations on mobile operators. Accordingly, the availability of fixed and mobile telephony services is as good as most countries, and better than many.

Broadband availability is likely to be lower in rural areas than in urban areas, comparing to other countries, because of issues associated with the distance that broadband services can be delivered overusing the copper wire infrastructure that provides exchange line services. Historically, Jordan Telecom put in narrow gauge wire which restricts bandwidth and distance.

The availability of fixed broadband service has increased rapidly during the last few years, resulting from extensive investment by Internet Service Providers (ISPs). The offered speeds vary between 10 and 100 Mbit/s with relatively competitive prices. As a result of competition among the ISPs, fiber optic network deployment and competitive pricing, the level of internet usage by individuals has increased to a level above the average penetration rate of both the Arab states and globally.

Furthermore, access to the local loop though unbundling and/or bit stream gives consumers yet wider choice in their provider of broadband services. That said, there is substantial influence of income on the uptake of fixed line: the table below indicates that there is significant (over 20%) penetration in only the wealthiest households.

Table 1: Penetration of fixed lines by income (% of households)

	Less than 100	100 – 199	200 – 299	300 – 399	400 – 599	600 – 999	1000 +
Urban Fixed	4.6	8.2	7.2	8.8	13.4	18.4	39.5
Rural Fixed	0	1.3	1.9	1.4	2.5	5.8	24.3

In terms of provision, there are around sixteen ISPs in Jordan for (example, but not limited to; Orange internet, Mada, VTEL, DAMAMAX, JEIS, Batelco, Al-Nai, TE-Data). With Orange's monopoly on landlines, providers have used Orange's copper network for the last mile connectivity, particularly for Asynchronous Digital Subscriber Loop (ADSL) services. This situation is changing rapidly with all of the major operators (and the electricity provider) now installing local fiber cables. Orange was the first operator to launch Fiber-To-The-Home (FTTH) service in Oct 2014, followed by Zain which started shortly thereafter.

With three major mobile network operators offering services across Jordan the market is highly competitive. Each of the established operators has significant market share in terms of mobile subscribers: the strongest player is Zain, which has consistently increased its market share over the last few years, largely at the expense of Orange. The mobile market in Jordan has grown rapidly with penetration rates now in excess of 100% by population.

In the new policy (ICTP Policy 2018), the Government intends to build on past success and provides operators with the latitude and support to further develop the networks and services needed for the digital economy. Therefore, the Policy specifies a number of measures to support the achievement of providing the foundation for the digital economy in the Kingdom. One of these major measures is the removal of barriers to subscribers switching between operators by enabling Fixed and Mobile Number Portability.

Indicator	Value	Latest Year
Mobile phone penetration	**100.1%**	**2017**
Percentage of households with Internet access	**88.8%**	**2017**
International Internet bandwidth (bit/s) per Internet user		
Percentage of the population covered by mobile networks		
- At least 3G	**99%**	**2017**
- At least LTE/WiMAX	**90%**	**2017**
Fixed-broadband subscriptions by speed tiers as a % of total fixed-broadband subscriptions		
- 256 Kbit/s to 2 Mbit/s	**4.75%**	**2017**
- 2 to 10 Mbit/s	**58.67%**	**2017**
- 10 Mbit/s or more	**33.49%**	**2017**

3. *ICT connectivity*

The National Broadband Network Program (NBN)[8]: is a nationwide fiber-optic high-speed network originally to connect all governmental entities including public educational entities, healthcare entities aiming to support the introduction and enhancement of e-learning, e-health and governmental e-services. This project mainly targets the following:

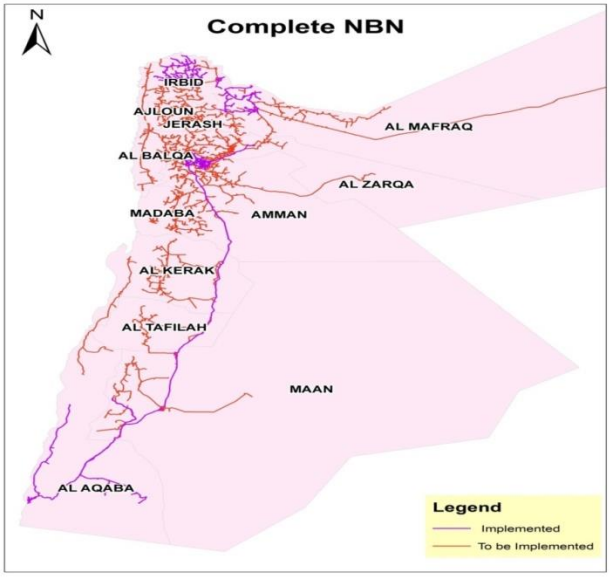
1- Bridging the digital gap, by reaching rural areas within the Kingdom.
2- Supporting national initiatives that focus on attracting foreign and domestic investments to support the information technology sector.
3- Connecting hospitals and health centers through automated procedures to improve services.
4- Connecting public schools for providing remote education and e-learning among universities and schools.
5- Improving governmental resources management by facilitating the growth of e-services

NBN Existing Networks:

- 977 connection points in Amman, Aqaba, Irbid, Mafraq & Ramtha
- South Region Project
  - 846 connection points in Karak, Tafila & Maan
  - Fiber Cabling completed
  - Active Equipment expected completion Q2 2019
- North Region Project
  - (664 connection points in Irbid, Jerash, Mafraq & Ajloun)
  - Fiber Cabling expected completion Q4 2019
  - Active Equipment expected completion Q4 2020
- Middle Region Project
  - 723 connection points in Amman, Zarqa, Madaba & Balqa)
  - Fiber Cabling expected completion Q4 2020
  - Active Equipment expected completion Q4 2021
- All Regions (including current projects)
  - Final Network layout (completed in 2021) will feature:

[8] http://moict.gov.jo/content/NBN-Program

- 3,268 connected entities
- 2,840 km of ring fiber cable
- 4,200 km of access fiber cable



In addition to the NBN Broadband network, public schools are linked via a broadband network provided by Umniah and Orange. The Umniah project currently provides access to about 2762 schools, while Orange provides access to 2475 and the NBN to 625. By end 2019, the NBN will cover about 1800 schools and therefore will leave gaps requiring the use of commercial services. The Umniah project provides video conferencing and VoIP between sites in addition to the OMIS system.

On the other hand, the higher education network was built in 2004 using OPGW over NEPCO transmission network. There is an IRU between the National Electric Power Company (NEPCO) and a non-profit university network company - JoNET. MoICT implemented the last mile solution with underground fiber cabling to the nearest power station. MoICT also provided the switches and the data center.

4. Internet Architecture

Internet access has been available in Jordan for well over twenty years and, unlike many other Arab countries, government has taken a relatively liberal attitude towards internet access. Broadband represents the majority of subscriptions and competition is predominantly infrastructure based, with DSL, WiMAX and mobile the most popular platforms.

With a combined capacity exceeding 1Tbps, and access to multiple submarine cables and terrestrial cross-border connections, Jordan's international connectivity is secure, and the country appears to have sufficient capacity to meet current and future medium-term needs. All telecom operators have access to international connectivity, with full competition that should result in a favorable price for international bandwidth.

Each of the three main operators has at least one international link. Orange have, in total, 5 gateways, including two submarine cable fiber links (Falcon & Flag) which land at Aqaba on the Red Sea and provide international connectivity on an open access basis, as shown in the figure below. There is direct connectivity to Egypt[9] as well as to global locations via the Falcon and Flag links. Zain have established a fiber link into Saudi Arabia, and Umniah have a fiber link to west. In both cases, onward routes and access to Internet exchanges are available.

[9] The national grids in Jordan (National Electricity Power Company, NEPCO) and Egypt (EETC) have installed a submarine cable fibre alongside a high voltage power line interconnecting their networks and making the excess capacity available to telecom operators in Jordan.

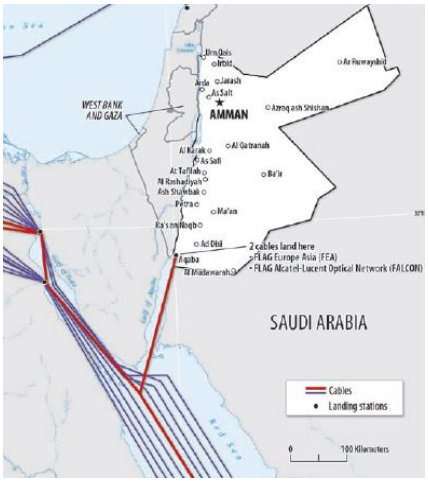
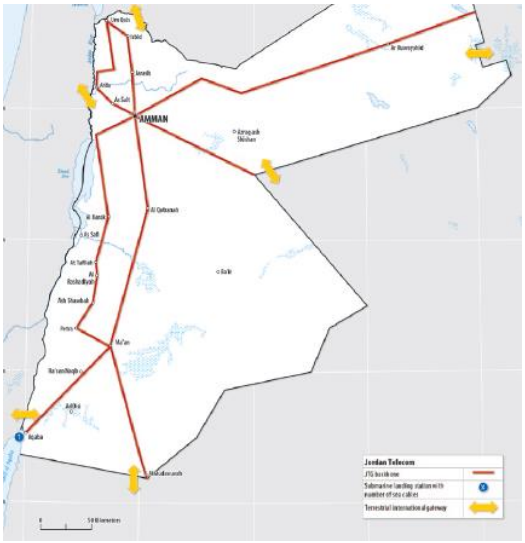


Figure 1: Jordan's International fiber links

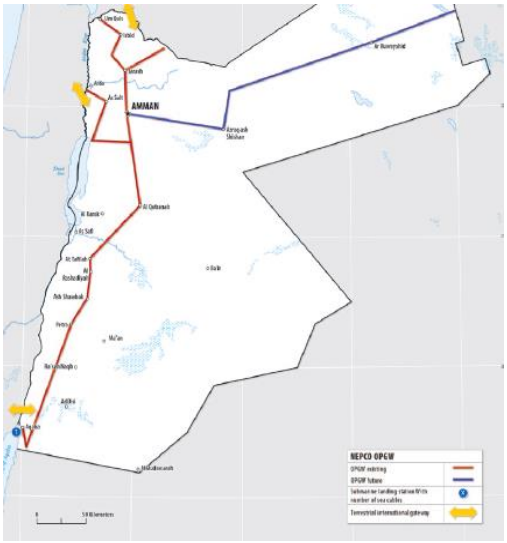
In terms of terrestrial regional connectivity, Jordan is well interconnected at the regional level with cross-border links to Egypt, Syria, Israel and the Palestinian territories and Saudi Arabia. NEPCO also provides connections with Syria and the Palestinian territories (Jericho).

There is a no single point of failure in the provision of international capacity for Jordan. In fact, there is a considerable amount of diversity both in terms of routes in and out of the country and in the ownership of these routes. This means that Jordan can reasonably be considered as an international hosting center, which is a major enabler in supporting e-commerce and for business to business supply chains.

Jordan's national transmission network is well developed. In addition to the incumbent's national network (illustrated below), and those of the mobile operators, there is also a high capacity network which runs along the power lines to provide a private network for the electricity sector, shown below.



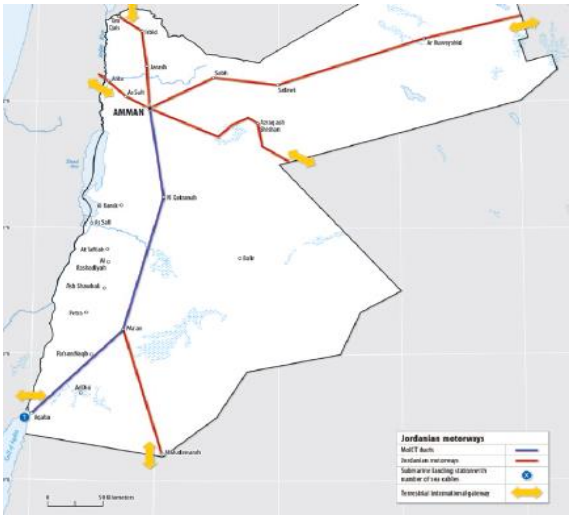
Orange's national fiber backbone



Fiber optic infrastructure of NEPCO

In addition to the main operators, VTEL Jordan (a subsidiary of a regional telecom operator) also own and operate a fiber optic backbone. It launched its operations in 2008 with the goal of becoming the country's first next generation network (NGN) operator providing data, voice, and related added value services to the wholesale, corporate, and residential markets. VTEL Jordan has made strategic alliances with local and international companies in order to offer clients broadband through fiber optics. It has invested in Gigabit Passive Optical Network (GPON) and has built over 150 km of fiber optic rings in Amman and the surrounding areas. In addition, VTEL Jordan built one of the largest Tier 3 Data Centers in Jordan offering colocation services, disaster recovery and hosting.

One other important element in Jordan's fixed infrastructure is the National Broadband Network, which is intended to support public services across the country. This network, shown below, has been constructed on the basis of its own fiber optic infrastructure along the highway between Amman and Aqaba and of fiber cables provided by NEPCO and the three local electricity distribution companies (JIPCO, EDCO, and IDCO).



Jordan's National Broadband Network

5. *Domain name management and adoption*

The National Information Technology Centre (NITC) is considered the administrator and exclusive registrar of the domain names ending in the Arabic TLD (.الأردن) and English TLD (.jo). The Centre is registered at the Internet Corporation for Assigned Names and Numbers (ICANN), and it is the body responsible for setting the policies of names and numbers on the Internet. To fulfil its role, the NITC follows the best international standards and the best applied practices, which are modified to be compatible with the existing Jordanian rules and followed social norms. Additionally, the NITC guarantees a solid and secure working environment for maintaining the rights of the domains' owners, which is achieved by following a highly transparent registration policy, while ensuring publishing the information of each registered domain.

The NITC provides the service of registering first- and second-class domains depending on the following approved classifications:

	Top-Level Domain
Commercial Entities	**.com.jo**
Service Providers and Networks	**.net.jo**
Not-for-Profit Organizations and Foreign Diplomatic Missions in Jordan	**.org.jo**
Jordanian Governmental Entities	**.gov.jo**
Jordanian Military Entities	**.mil.jo**
Jordanian Educational Institutes – public and private–	**.edu.jo**
Jordanian Schools – public and private–	**.sch.jo**
Jordanian and non-Jordanian Persons	**.per.jo**
Jordanian and non-Jordanian Ph.D. Holders	**.phd.jo**
All of the above mentioned except Jordanian and non-Jordanian Persons	**.jo**
All of the above mentioned except Jordanian and non-Jordanian Persons	**.الاردن**

For more information about Jordanian domains registration kindly visit the following websites:
http://www.domain.jo

Name of ccTLD registrar	مركز تكنولوجيا المعلومات الوطني National Information Technology Centre
URL of registrar	(http://www.nitc.gov.jo/)
Total Number of ccTLDs registered in the country for the years 2015, 2016, and 2017.	2015: 4738 2016: 4763 2017: 4915

To promote the registration of Arabic ccTLD (IDN), NITC has started a promotion plan one year ago with government entities, universities and institutions. The registered IDN was 142 Arabic domains and now it has reached 355 Arabic domain names.

There is no officially accredited domain registrar for NITC, thus there is no URL.

B. Governance (C1 and C11)

1. Public/Private Partnership (PPP), Multi-Sector Partnership (MSP) and Role of Non-Governmental Organizations

There are three-advocate committees led by the Minister of Information and Communications Technologies

Information Communication Technology Advocate Committee (ICTAC) is an ICT advisory body, chaired by the Minister of ICT, which represent a formal partnership between public and private sector stakeholders. ICTAC's mission is to develop, advise and track the long-term strategic vision for the ICT sector by advocating reforms that enable the growth and development of Jordan's ICT Sector. The ICTAC membership is subject to review as in 2018 new members were nominated by a cabinet decision. This new committee has the mandate to coordinate with stakeholders to formulate and update national policies and legislative documents required to develop the ICT sector and stimulate the investment environment in the sector.

Entrepreneurship committee: formed by Prime Minister decision, aiming to identify projects/initiatives that stimulates the environment of entrepreneurship in the Kingdom to increase its contribution to the economy (providing employment opportunities), also to address the challenges facing the entrepreneurs. This has become a necessity as the entrepreneurship in Jordan is witnessing a significant development and a high demand by young people to establish small and emerging companies.

E- government Committee: it was established in October 2018 according to a Cabinet decision. Its main objective is to review and recommend actions to accelerate and develop e-government services to citizens. It is worth mentioning that most of members of this committee are from the private sector.

Privatization of the NBN: MoICT is considering privatizing the network. A Government committee with members from Jordan Investment Commission, Ministry of Finance, MoICT and others is involved in the project to privatize the NBN. MoICT issued an RFP for a consultancy study to look at the feasibility to go for a PPP covering the technical and managerial requirements, investment required for the network, additional resources that could be provided , legal and contractual requirements including pole and duct contractual requirements, other stakeholders' constraints and requirements and recommended type of contract.

Furthermore, the development of information society is apriority not only for Jordanian government, but **NGOs** are deeply engaged and have their own related projects. Below are examples of these projects;

Digital Content Pioneer Initiative
The initiative, launched by int@j, aims to "produce" tenth and eleventh grade students in all public schools nationwide. The initiative aims to build a generation aware of the importance of developments in the ICT sector and is qualified to maintain Jordan's position in the Arab content industry. This initiative, the first of its kind in the region, also aims to increase the percentage of Arabic content on the Internet

Train 20 Jordanian companies in the IT sector to work on the means of communication

- The ITC Association, in cooperation with int@j organized a training program for 20 companies from the IT sector to develop their capacity and marketing tools for work through social media.
- The program also aims to network companies with young Jordanians and Syrians who have been trained during the "Jordanian and Syrian Youth Skills Development Project" to work with these companies to carry out promotional campaigns for their products through electronic platforms.

A platform that includes all the data from the Entrepreneurship system (StartupsJo)

- int@j launched the "StartupsJo" platform. This platform is the first Jordanian electronic platform that includes all data and information related to the Jordanian entrepreneurial system in terms of the names

of the start-up companies, details of their projects, investors, sponsors and financiers of leading companies in Jordan.

- This platform aims to be an interactive and promotional portal for Jordanian start-up companies to obtain investment opportunities and increase the digitization of the economy in accordance with the objectives of the REACH 2025 initiative.

Amwalcom Platform

Amwalcom ss part of the pioneering business system to enhance financial inclusion, In cooperation with int@j, Tank launched a security incubator for the Entrepreneurship, which is the first Jordanian website to view different financial/banking products. The website allows banks to market their product range to a larger segment of users interested in banking products with a higher conversion rate than any other marketing method. Citizens will save time and effort by replacing personal mobility between banks and financial institutions to compare offers.

The 1000 Leadership Initiative

The initiative aims at providing more support to young people in all governorates of the Kingdom to be successful, creative entrepreneurs in order to significantly increase employment opportunities in the coming years. The initiative will allow entrepreneurs to obtain guidance on the mechanisms of establishing leading companies, developing business models and marketing tools. This includes networking with investors and partners and how to pitch for ideas and companies to potential investors an partners in addition to other mechanisms/skills for leadership and entrepreneurship.

2. Participation in Internet Governance activities

TRC is currently working with stakeholders regarding the establishment of a national local Internet Exchange Point in Jordan, as well as safe transition to IPV6. A national project aims to establish a local IXP in Jordan is in process with the involvement of all required stakeholders (ISP's, MNO's, ICANN, MENOG, RIPE NCC and the private sector).

C. Legal environment, ethics and building trust (C2, C5, C6 and C10)

1. Legal and regulatory environment

The Telecommunications Law No. 13 of 1995: It was issued to regulate the telecommunications sector when privatization of the telecom market was introduced, and more than one player entered the market.

It was subject to a number of amendments since its issuance, the last of which was in 2011, where information technology was added to the law and the board of commissioners was reconnected to the Telecom Minister.

The Electronic Transaction Act No. 15 of 2015: It replaced the temporary law no 85 for 2001. It aims to enhance e-services and e-commerce transactions by identifying the legal framework for doing business online and for making contracts via electronic means. The law applies on all electronic transactions, except those specifically exempted by it.

The TRC, as per Article (23) of the law, was given the authority to license and accredit the bodies for electronic authentication and to regulate their work pursuant to the bylaws and instructions in this Law. The same article gives MoICT the authority to administer the electronic authentication system for the root certificate. The MoICT is also the principal authentication authority for governmental entities.

The Licensing and Accrediting bodies for Electronic Authentication Bylaw No. 86 of 2014: It emphasized the authority of the TRC to license and accredit the bodies for electronic authentication and to regulate their work. In addition, it identifies the requirements requested from the party wishing to be accredited and the conditions that the accredited party needs to abide by.

The Electronic Payment and Transfer Bylaw No. 111 of 2017: It has just been issued pursuant to the Electronic Transaction Act. This bylaw enters into effect after 120 days of its publication. It aims, in general, at regulating electronic payment and transfer services.

The Audio Visual and Media Law No. 26 of 2015: It has replaced the Audio Visual and Media Temporary Law No. 71 of 2002. This new law actually introduced some of the recommendations introduced in the "Green paper on the convergence of media and telecommunication in Jordan" and the "Analysis of the comments on the convergence of media and telecommunication in Jordan". It seems that the new law, despite the improvements t, still faces shortfalls which were pointed out in an analysis of the law done in 2016 under the title "Analysis of the Audio-Visual Media Law, No.26 for the year 2015"[10]

Cybercrime Law No. 27 of 2015[11]: It replaced the temporary law no 30 of 2010. It identifies the punishments and penalties imposed on violators of the electronic means, specifically the unauthorized use of and access to the internet or the information system for the purpose of changing, cancelling, altering, copying, publishing illegally. This law is subject to discussion at the Legislative and Opinion Bureau for amendments, where an addition to specific content, such as hate speeches and programs offensive to human dignity and rights, is being introduced.

Draft of Rights of Way Bylaw: It has been published for public consultation. This bylaw represents a legal framework to encourage the development of telecommunications networks through the management and regulation of rights of way for the deployment of the necessary infrastructure by licensees.

International Treaties and Conventions on Intellectual Property	Adopted (Y/N) or Observer	Year of Adoption
WTO	Yes	1999
Paris Convention	Yes	1972
PCT	No	
WCT	Yes	2004
Madrid Agreement	No	
Hague Agreement	No	
PLT	No	
TRIPS	Yes	2000

Cyber Laws	Available?	Law number	Year Passed
e-transactions law	*(yes)*	The Electronic Transaction Act No. 15 for 2015	*2015*
e-signature law	*(yes)*	The Licensing and Accrediting bodies for Electronic Authentication Bylaw No. 86 for 2014	*2014*
e-payment	*(yes)*	Electronic Payment and Transfer Bylaw No. 111 for 2017	*2017*
e-commerce	*(yes)*	The Electronic Transaction Act No. 15 for 2015	*2015*
Management of PKI available	*(yes)*	Jordan PKI infrastructure was set up in 2016	

2. *Privacy and Data protection*

The Constitution of Jordan contains a specific provision concerning privacy. Article 18 states that "All postal and telegraphic correspondence, telephonic communications, and the other communications means

[10] Analysis of the Audio-Visual Media Law, No.26 for the year 2015", carried in cooperation with the EU under the "Support to Media in Jordan" in 2016

[11] http://www.jcca.org.jo/DataFiles/2017/10-2017/%D9%82%D8%A7%D9%86%D9%88%D9%86%20%D8%A7%D9%84%D8%AC%D8%B1%D8%A7%D8%A6%D9%85%20%D8%A7%D9%84%D8%A7%D9%84%D9%83%D8%AA%D8%B1%D9%88%D9%86%D9%8A%D8%A9.pdf

shall be regarded as secret and shall not be subject to censorship, viewing, suspension or confiscation except by a judicial order in accordance with the provisions of the law."
Jordan is a signatory to a number of **international instruments** with privacy implications. These include:

- The Universal Declaration of Human Rights;
- The International Covenant on Economic, Social and Cultural Rights;
- The International Covenant on Civil and Political Rights;
- The Convention on the Rights of the Child
- The Cairo Declaration on Human Rights in Islam; and the Arab Charter of Human Rights.

Draft of Data Privacy Protection Law[12]: In Sept 2018, MoICT called for the third public consultation on the Data Protection Law. The draft Law considers the requirements of the GDPR. The proposed version still has major issues regarding the independence of the privacy commission, as the law proposes an assigned board/council for the privacy commission with a majority of its members from the government. An amended version will be subject to a fourth round of public consultation by mid of 2019.

3. Countering misuse and preventing abuse of ICTs

A **Cybercrime Law** was enacted in 2012. The criminal activities outlined in this law include illegal access to websites, allowing minors to access pornographic material, promoting terrorism and prostitution and human trafficking as well as accessing information not intended for the public.

The law does not provide many details regarding what exactly is considered an offence. Article 3, for instance, does not clarify what "entry without permission" means when it states that "entry to websites without permission or while violating permission" would lead to punishment. After gaining permission from a court, it is possible for the judicial police to retain the right to control or restrict access to the information systems, the devices and the data used to commit the crime (Article 12).

The Jordanian government has proposed a cybercrime bill draft amendment, which has since been withdrawn in December 2018 in the face of protests from rights organizations. The proposed amendments were mainly the following:

- Penalizes anyone that publishes or republishes "Hate Speech".
- Intensifies penalties for the following crimes: "unauthorized access to a website", "unauthorized access to data", "fraud" and "hacking" with a prison sentence.
- Penalizes violating people's privacy from three months to three years in prison.
- Penalizes creation and the publication of any "pornography content".
- Adds "search" to the powers of judicial police that already include "retain the right to control or restrict access to the information systems, the devices and the data used to commit the crime (Article 12)."

A special Unit has been established under the Public Security Directorate. This unit is specialized in combating all electronic crimes from theft and penetration of e-mail, abuse, defamation, insulting or extortion by means of electronic means and tracking and detection, because all of these pose a danger to the security of the individual and society. The Unit is keen to provide employees with the latest technical devices to help them obtain accurate information and increase productivity, continuing training programs for the technical staff, seminars and specialized conferences, in addition to organizing courses and workshops in the field of combating crimes.

This cybercrime unit published on its official website on the social media an explanation to the citizens on how to submit a cybercrime complaint and how to communicate with the unit in case they faced pertinent issue/crime.

[12] https://www.tamimi.com/law-update-articles/data-protection-in-jordan-an-overview-of-the-current-and-future-framework/

4. *Use of electronic transactions and documents*

Based on the Licensing and Accrediting bodies for Electronic Authentication Bylaw No. 86 of 2014, Telecommunication Regulatory Commission (TRC) was given the authority to license and accredit the bodies for electronic authentication and to regulate their work. In addition, It identifies the requirements requested from the party wishing to be accredited and the conditions that the accredited party needs to abide by.

The Jordan public key infrastructure (PKI) was set up in 2016. This PKI indicates the roles, policies, and procedures needed to create, manage, distribute, use, store and revoke digital certificates and manage public-key encryption.

The implementation of digital identity management including digital signature and multi-factor authentication is under progress, will be launched on October 2019.

5. *Online and network security*

MoICT has published the National Cyber Security Strategy (NCSS) 2018-2023**.** This document, approved by the cabinet in January 2019, explains the vision and prospective programs that will be developed and customized by the regulatory and advisory governmental entity. The document mentions repeatedly the need for cooperation with international partners and the private sector, but it does not specify who those partners would be. The Strategy shows the government interest to have good level of awareness of cyber issues by highlighting, among its objectives, the need to raise the cybersecurity awareness and providing capacity building program in its objectives. Moreover, in order to achieve the Strategy objectives, the government identified a set of priorities to bring a new, unified approach of how the Government and business deals with cybersecurity.

In Jordan there are two CERTs one called “Jordan-Computer Emergency Response Team (JO – CERT)” and the other called “Jordanian Armed Forces -Computer Emergency Response Team (JAF-CERT)”:

1. **Jo-CERT** is responsible of managing the incident over two CERT teams are set up and running:
   - Government CERT, for government entities. A security operation centre for all government entities that monitors the critical assets of government entities and it is operated by theNational Information Technology Centre (NITC).
   - The (JAF – CERT) is responsible of managing the responds to cyber risk on the military side.

Moreover, Jordan is now working on establishing a national agency/commission to manage the incident over the national level (by covering academia, law enforcement, civil society, private sector, public sector, military...etc.)

2. **JAF Cert**, for military entities. A security operation centre that monitors the critical assets of military entities and responds to cyber security and incidents. مركز الاستجابة لحوادث الأمن السيبراني في المؤسسات العسكرية

JAF CERT and **Government CERT** exchange information and respond to incidents together, both CERTs have SOCs which provide continuous monitoring for some critical assets and networks. Mutual assistance with international law enforcement and intelligence is managed by General Intelligence Department.

There are many secured and reliable applications facilitating online transactions in Jordan. The Central Bank of Jordan worked on ensuring the interoperability between payment systems in general and retail payment in particular to facilitate and accelerate making and accepting payment operations. This, consequently, would be reflected positively on all actors of the retail payment ecosystem such as consumers, traders, government institutions in addition to other companies.

Jordanian national mobile payments switch system (JoMoPay), which is the system that has created cross-platform and platform level of interoperability for multiple digital payments instruments in Jordan. This includes interoperability between the licensed mobile payments services providers (MPSPs) as well as interoperability between mobile wallets, bank accounts and prepaid cards. This type of system can facilitate

electronic payments from electronic wallets as well as card payments for e-government services and e-commerce.

eFAWATEERcom is an electronic bill payment and presentment system that is owned by the Central Bank of Jordan and aims at providing this service to its customers through different banking channels and payment service providers.

Regarding the cybersecurity measures are taken to ensure online transactions are secure, this includes multi-factor authentication, secure communication channels, hosting all government e-services in one secure data centre, periodic security tests and before launch. In addition, ISO 27001 standards are being implemented on the data centre that host all government e-services and the operation team.

The main examples for the national practices in the field of information and network security is the National Cyber Security program that was launched in 2016. Phase I completed in 2018 and Phase II started in 2019 as per the approval of the Prime Ministry to establish a government entity that is responsible only of the national cybersecurity and centralizes the different CERTs communication in Jordan.

III. Cluster Three: Digital Economy, Employment and Trade Policy Areas

A. Building the ICT Sector (C12)

1. ICT Firms

The ICT sector in Jordan is highly disaggregated considering the relatively small size of the sector. Overall, there are approximately 700 firms, the below table describes the activities and number of companies that fills under the sub-activities for the ~700 ICT companies.

Main Activity	ISIC Activity	Number of ICT Firms	% Regarding to ISIC Activity	% Regarding to Main Activity
Software related companies (294)	Software development	217	74%	42%
	Software licenses publishing	31	11%	
	Software licenses sale	28	10%	
	Wholesale of software	18	6%	
Telecommunications related companies (92)	Telecommunications equipment installation	21	23%	13%
	Telecommunications value added services	17	18%	
	Telecommunications equipment and telephones wholesale	16	17%	
	Telecommunications wireless services	13	14%	
	Telecommunications wired services	10	11%	
	Other telecommunications services	8	9%	
	Telecommunications equipment maintenance	4	4%	
	Telecommunications voice over IP services)	2	2%	

	Telecommunications satellite services	1	1%	
Content related companies (59)	Mobile applications development	13	22%	8%
	Online applications development	10	17%	
	Mobile applications customization	6	10%	
	Online applications customization	2	3%	
Others (262)	Data processing and hosting related services	68	26%	37%
	IT Hardware & infrastructure wholesale	53	20%	
	Other IT activities	38	15%	
	ICT Consulting and Research	27	10%	
	Repair of computers and peripheral equipment	15	6%	
	IT Hardware & infrastructure installation	14	5%	
	ICT Training	10	4%	
	e-Commerce business	9	3%	
	others	14	5%	
	IT Networking equipment maintenance	7	3%	
	Call centers	4	2%	

Source: ICT & ITES Statistics and yearbook 2016

The companies working in the sector are distributed over the following three groups:

a. **Telecommunications Companies** includes telecom and network operators

Telecommunications related companies are **92** companies listed as follows:

Telecommunications Companies	No. comp.
Telecommunications equipment installation:	21
Telecommunications value added services	17
Telecommunications equipment and telephones wholesale	16
Telecommunications wireless services	13
Telecommunications wired services	10
Other telecommunications services	8
Telecommunications equipment maintenance	4
Telecommunications voice over IP services)	2
Telecommunications satellite services	1

b. **Content Firms (Local and national digital content development):** includes the following:

- Digital content development for computers, mobiles or tablets (apps), Web-based, on CD or DVD, carrying out bespoke content systems, localization/adaptation/Arabization.

- Creation and distribution of applications in local languages, as well as content that is relevant to different segments of population, including non-literate people, persons with disabilities, disadvantaged and vulnerable groups.

The companies that Activates related to **Content** are **59** companies listed as Follow:

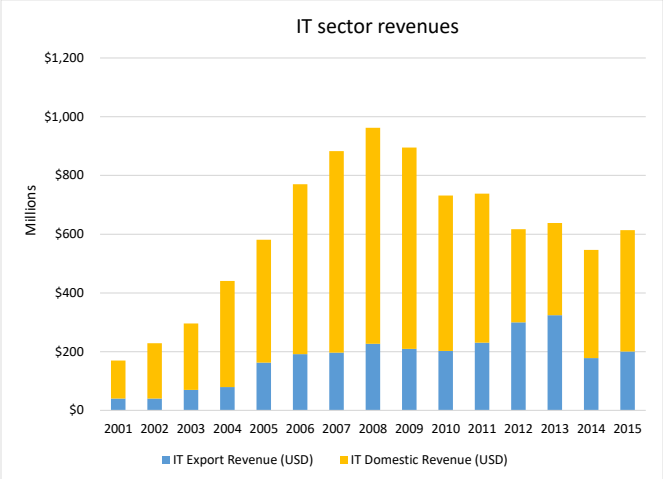
Content Companies	No. comp.
Web portals	28
Mobile applications development	13
Online applications development	10
Mobile applications customization	6
Online applications customization	2

c. **Software Companies:** includes companies working on development on software for enterprises, tools and applications for laptops and mobiles. The companies working on software activities are 294 companies listed as Follow:

Software Companies:	No. comp.
Software development	217
Software licenses publishing	31
Software licenses sale	28
Wholesale of software	18

The largest sector in terms of revenue is the wholesale supply of IT equipment, accounting for nearly 35% of the sector's revenues. The next largest is computer programming which accounts for over 26% of the sector's revenues. E-commerce accounts for a further 10% of the revenues. Even for IT wholesaling and computer programming however the number of companies is so large, the average revenue is respectively only $2.5m and $544,088. While some firms will be large, there is an indication of a very long tail of small firms that are too small to make the necessary investments in intellectual property for long term survival. The average firm in the IT sector has a sub $1m turnover.

In contrast, there are two e-commerce firms identified with an average turnover of $32m.

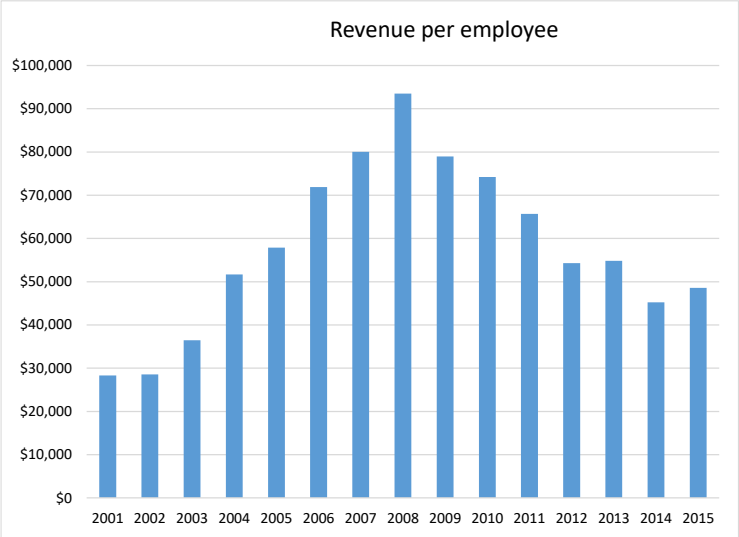


The above figure shows the impact on the revenue profile of these sub-sector revenue trends for the period from 2001 to 2015 for domestic and export revenue and in total. This complex revenue profile is a consequence of international economic conditions post 2008, changes in government spending on IT - since government spending underpins the sector - and changes in taxation, which encouraged IT firms to move to lower tax countries. The subsequent reduction in taxation decision taken by the Cabinet in 2014 seems to have had a supporting effect and may be the reason for the late growth in domestic and export revenue, with firms returning to Jordan.

Domestic revenue has shown relative weakness since 2008, and it is still too early to determine whether the recent increase in revenue will be sustained. In contrast, export revenue has grown until recently both in absolute terms and in proportion to total revenue.

The model that is currently being pursued, whereby Jordanian firms are the "kitchen" providing intellectual property and expertise to foreign subsidiaries responsible for export sales seems to be working. Indeed, the rate of increase in the proportion of total revenues from exporting seems to be rising, given the upturn in the best fit trend line.

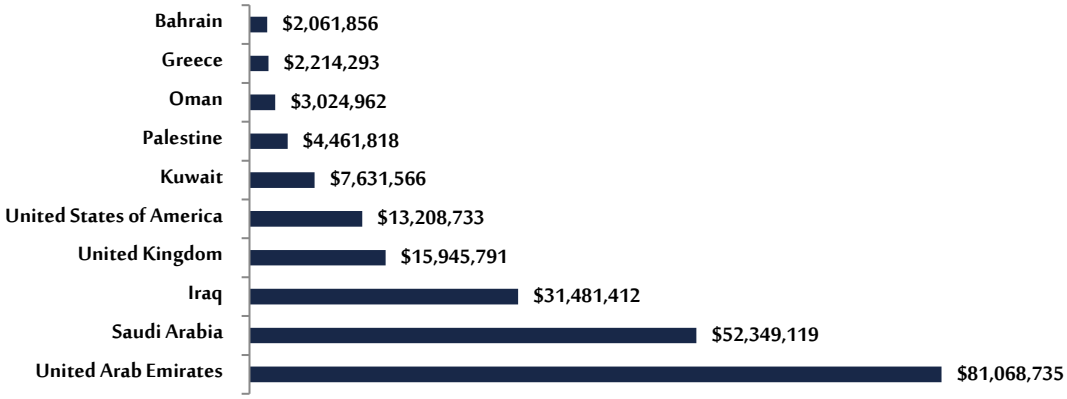
While revenues declined for six years from 2008, the number of IT and IT enabled systems (ITES) employees has grown consistently since 2001. The consequence of this rise in employee numbers when revenues were in decline is shown in the figure below. This shows that revenue per employee has declined significantly from the peak of over $90,000 per annum in 2008, to under $50,000 in 2014 and 2015. The reasons for the continued increase in staff when revenues were declining have not been determined. However, possible reasons include the change in revenue distribution in favour of lower paid or employee intensive sub-sectors such as call centres and maintenance and repair and away from higher paid or less intensive sub-sectors such as wholesale, computer programming and consultancy.



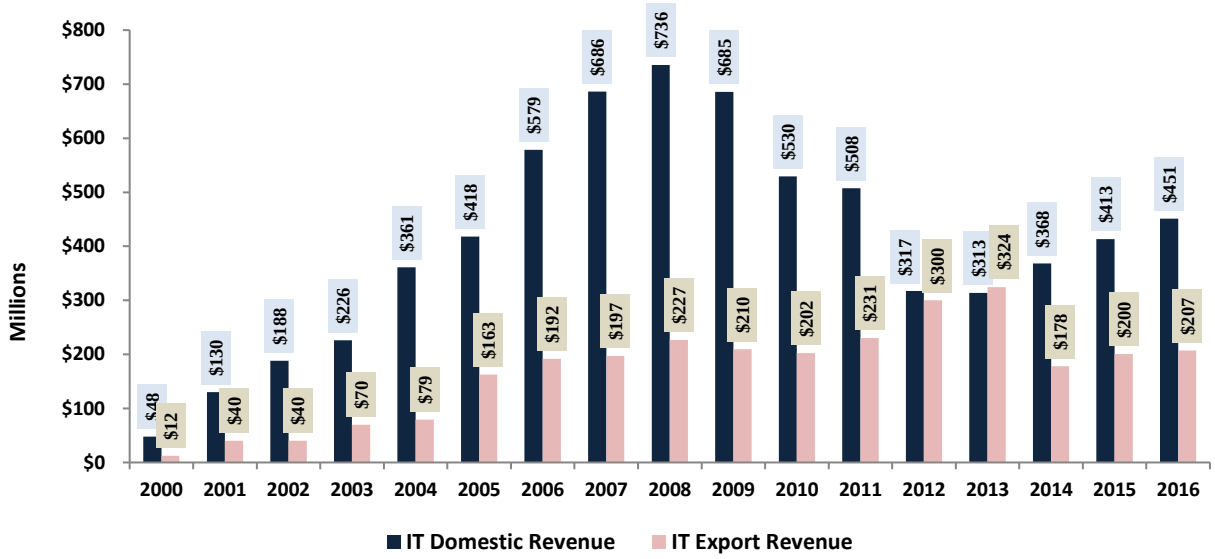
The ICT sector in Jordan is employing more than 17,000 employees, which constitute 1.3% of the total workforce. The number of workers in the telecommunications sector separately is more than 4,000 jobs, while the number of employees in the information technology sector exceeded 13,000 jobs, 30% of which are females. ICT workers in all economic sectors have exceeded 60,000 jobs.

Employment for ICT 2016	
IT and ITES Sector Employment	13,187 *
IT Employment	11,023
ITES Employment	2,164
Telecom Employment	4,225
ICT and ITES Sector Employment	17,412

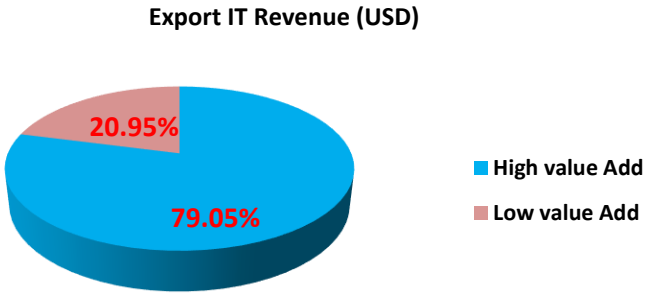
*** 71% male / 29% female**



The above figure shows IT and ITES Exports Volumes by Country in 2016, where 73% out of Export revenue is coming from UAE, Saudi Arabia & Iraq.

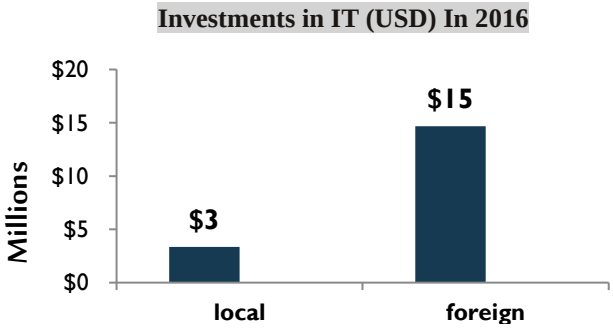


The above figure shows IT and ITES Exports & Domestic revenue in 2016, where the proportion of exports revenue reaches to $207 million.



According to the figure above, 79% of exports revenue results from "high value-added" IT activities, demonstrating that the IT industry brings high value to the Jordanian economy mainly in exports.

- High Value-Added Services: where the majority of the service or product is from local sources (i.e. huge domestic processing) and value or cost is within Jordan rather than imported
- Low Value-Added Services: where is the majority of the service or product is from foreign sources (i.e. slight domestic processing) and the value or cost is imported from outside Jordan



Source: ICT & ITES Statistics and yearbook 2016

As shown above, 81% of the investment in IT is foreign investment.

2. *R and D, Innovation and Standardization in the ICT sector*

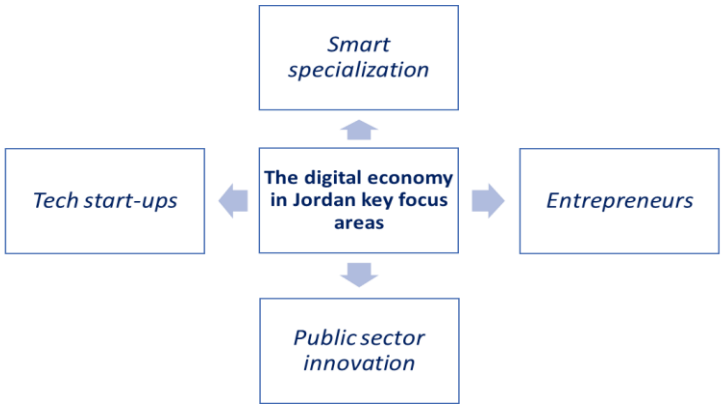
Jordan is committed to serving as an innovation hub in which out-of-the-box ideas can thrive. Take a front row seat as Innovative Jordan spotlights and celebrates local innovations, breakthrough technologies, budding and successful entrepreneurs as well as the entrepreneurial ecosystem's supporting entities.

R&D is carried out in Jordan at higher education institutions or by public and private research centers. It is mainly funded by different local entities and agencies including universities; the Scientific Research Support Fund (SRSF), Industries, the Higher Council for Science and Technology (HCST), some research centers, King Abdullah II Fund for Development (KAFD) and King Abdullah II Design and Development Bureau (KADDB) or through international organizations such as the EU commission.

REACH 2025 strategy, which is an ICT sector strategy, mainly focuses on innovation. The strategy identifies four key areas to reach digital economy: which are Tech start-ups, Entrepreneurs, public sector innovation & smart specialization

Smart specialization entails innovative combinations of existing and talent resources in new ways, which can be enabled further by digital technologies to create outreach and scale with new types of services. Addressing the issue of specialization in R&D and innovation is particularly crucial for regions/countries that are not leaders in any of the major science or technology domains.

Thus, in Jordan, smart specialization focuses on unlocking the potential for digitization in areas where Jordan has – or has the potential to develop – a competitive advantage, and through key tech verticals where Jordan currently has a strong hold. It can also be in areas/sectors of global importance, where Jordanian firms can be positioned in global value chains and can become a development partner, which can open up to further market opportunities. The increased digitization of the global economy provides an opportunity for Jordan to focus on further developing digitally enabled solutions to meet demands from key sectors. A focus on smart specialization is therefore of key importance for linking the ICT sector and the overall economy, and for assisting Jordan in shifting its effort towards the digital economy, which can drive productivity and service innovation.



Innovative Jordan is a nationwide campaign celebrating the achievements of Jordan's innovators, entrepreneurs and creative youth. Launched in May 2017 by Oasis500 – the leading seed investment company and business accelerator anchored by the King Abdullah II Fund for Development (KAFD) – the campaign aims to strengthen Jordan's standing as a regional hub for innovation and to build a generation that contributes to sustainable development through innovative, original ideas.

Shedding a light on Jordanian innovations, breakthrough technologies and the rise of the knowledge economy, Innovative Jordan strives to keep the Jordanian public apprised of Jordanian success stories as well as the many entities that offer their support to budding entrepreneurs. By consolidating the nation's innovation-enabling and entrepreneurship-promoting efforts on a single platform, Innovative Jordan serves as a national innovation aggregator, providing Jordanian youth with easily accessible tools to originate new solutions to economic and social challenges. The campaign also aims to introduce Arab and foreign investors to the many advantages that Jordan's innovation-enabling ecosystem has to offer.

To strengthen innovation in ICT sector in Jordan, many initiatives were introduced by both public and private sectors, some thereof are as follows:

The National Centre for Research and Development (NCRD): It was established at the end of 2010 with an objective to develop scientific capabilities in the areas of nanotechnology, biotechnology, energy, Badia research program and any other research interest of importance to Jordan. The Center assumed the responsibility over already existing centers and programs in the areas mentioned above. All legal, financial and administrative issues have been transferred to the Center. It is envisaged that NCRD will lead research activities in Jordan. This requires the prioritization of research fields, coordination of efforts, alleviation of obstacles and provision of logistical and financial support in order to reach research results that solve problems and develop new products and/or services in all industrial, agricultural, commercial, administrative fields including IT. It is also anticipated that NCRD will participate in translating research results into new projects and investments and create new employment opportunities.

The National Consortium for Technology and Business Incubation (NACTIB): It was established by the Higher Council for Science and Technology, the Royal Scientific Society, Princess Sumaya University for Technology, and the University of Jordan. NACTIB aims at assisting Jordanian start-ups and entrepreneurs through incubation and provision of technical, economic, administrative and legal support services to enable them to develop their ideas into successful businesses that, in turn, maximizes their contribution to the national economy and assists the government in its endeavors to create job opportunities in the Kingdom.

The establishment of NACTIB came as a recognition of the need for an orchestrated effort to enhance the indigenous Research and Technological Development (RTD) capacity and credibility through the establishment of a network to harness and optimize the use of existing RTD Centre's resources. This is in order to create an environment conducive to the development and growth of knowledge-based enterprises and promote RTD activities in the private sector in Jordan.

NACTIB will cater for a set of functions including but not limited to the following:

1. Diagnosis of entrepreneurs and start-up companies' requirements;
2. Incubation of start-up technology companies and entrepreneurs;
3. Collaborative and Contractual RTD with producers of goods and services;
4. Technical services;
5. Management support services;
6. Consulting services in business related disciplines;
7. Linking entrepreneurs and start-up companies to financing;
8. Access to proprietary technology and intellectual property;
9. Internships and co-op arrangements;
10. Customized training and education;
11. Links to other scientific institutions.

Information & Communication Technology Business Incubator (ipark): It provides an appropriate environment for entrepreneurs to enable them to develop their ideas into commercial businesses. The incubator provides entrepreneurs with the technical and management services needed for developing their ideas in addition to access to financing. The establishment of the incubator at the premises of the Royal Scientific Society (RSS) was mainly sponsored by the HCST. The ipark incubated 16 start-ups, 5 of which graduated, and the rest are still incubated. All companies are working in the area of information and communication technologies.

Jordan Innovation Centre for Engineers and Industrial Enterprises at Royal Scientific Society: This incubator was established in 2005 as a Joint venture sponsored by RSS, Jordan Engineer Association (JEA), Amman Chamber of Industry (ACI) and Euro Jordan Action for Enterprise Development (EJADA). The aim of this incubator is to foster start-up technology-based industrial engineering projects and provide them with the needed support to bring them to the commercialization stage. Currently there are five projects being developed at the incubator, these projects are: Educational Toys; Anti Snoring; Building Insulation; Ubiquitous Computing; and Financial Analysis.

On the other hand, there are many initiatives from NGOs and private sector to the strengthening innovation in the ICT sector; some are listed below:

Research & Development Co. is a leading contracting implementation & supplier in the Middle East with a highly experienced & qualified staff in the IT-Telecom marketplace.

PremaIT Solutions is one of the largest and most respected privately owned companies. Strong leadership and sustainable funding have allowed it to grow into one of the largest information technology multinationals in Jordan. With headquarters in Amman, it now has more diverse operations in multiple IT business fields than almost any other similar companies in the region. It believes that a technology firm must offer tremendous value to its clients by creating an opportunistic, performance-oriented environment where the best consultants and developers are empowered to tackle the most challenging projects head on.
Samsung R&D Institute Jordan (SRJO) was established in late 2014 in Amman to support local business, based on local language and culture, and to develop local-based services and contents.

Phi's Applied and innovative Research program (PAIR) is a two-year accelerator supported by the Embassy of the Netherlands in Jordan, which integrates applied scientific research with innovation and entrepreneurship to create a scientific community of young pioneer researchers and innovators.

Zain Innovation Campus (ZINC) is a platform that includes all the initiatives and programs of Corporate Entrepreneurship Responsibility. The campus was launched in 2014.

Columbia University Middle East Research Center brings together a number of constituencies ranging from Columbia students and faculties - engaged in research at the Center - to local partners and its advisory board, which provides governance and oversight of the center.

Nanotechnology Institute in Jordan University of Science and Technology (JUST) specialized in nanotechnology research and education. Launching such institute is important in innovation and stimulation of scientific research as well as promotion of research role in different scientific field according to both the Kingdome and the university strategic plans. This is through participating in the countries' development and to enhance the research quality nationwide.

Hamdi Mango Center for Scientific Research (HMCSR) is a unique multidisciplinary research center devoted to promoting different fields of scientific research and transforming it to applied science and engineering projects.

The regular review of the National Science and Technology (S&T) Policy aimed at reflecting the evolving national and international developments encompassing Science, Technology and R&D priorities and performance indicators. This is undertaken by the Higher Council for Science and Technology (HCST) who launched the National Science, Technology, and Innovation Policy and Strategy (2013-2017) in Q1 2013.

On another note, the sale of intellectual property in IT, such as firmware or software, must take into account the requirements in many countries, not just Jordan. Jordanian firms face the additional cost in selling, installing and maintaining IT solutions due to the need to locate staff in multiple countries.

With regard to persons with disabilities, the Higher Council for the Rights of Persons with Disabilities (HCD) mission is "Policymaking, planning, coordination, follow-up and support for all activities that serve Persons with Disabilities through the adoption of participatory management, wise governance, accountability and transparency". HCD's vision is to have a society in which people with disabilities have a decent and sustainable life that will grant them effective participation based on equity and equality. In this regard, the Council works with the concerned authorities to implement accessibility requirements for buildings, roads, facilities and other public and private places, and to adapt them in accordance with the Building Code Requirements for Persons with Disabilities. This is in addition to transforming services and goods into accessible formats for use by different sectors in society, within a period of no more than five years. Tasks of the HCD are:

1. To provide consultation and technical support to the Department of Accreditation to develop accessibility and universal design standards.
2. To coordinate with various government authorities and assist them in making their facilities accessible.
3. To follow up on the implementation of the ten-year strategic action plan on accessibility currently being developed by the Ministry of Public Works and Housing and other stakeholders in the field to amend existing buildings or to renovate them completely.

3. *Government facilitation, Investments and Financing the ICT sector*

Jordan Investment Commission has a mission to stimulate investments in the Kingdom by keeping pace with and developing infrastructures, promoting investment opportunities and exports to increase the effectiveness of domestic and foreign investments in addition to ensuring financial sustainability. The Commission provides an "Investment window", or what is so-called the one-stop service, which is considered one of the most important means of enabling local and foreign investments by simplifying the registration and licensing procedures for investment projects benefiting from the Investment Law. The investment window includes representatives of the official authorities concerned with granting the approvals and licenses for investment projects in addition to the qualified staff of the Commission to facilitate the procedures and follow-up.

In addition, through the Investment Commission, the government will develop a financing and support program for start-up IT firms with the aim of developing and commercializing intellectual property associated with emerging information technologies. This program will provide a framework for angel investors and others to put in place finance and incubation for start-up IT firms including those that are aiming at commercialization of academic research in information technology.

Government through the Innovative Start-up and SME Fund (ISSF), operated by the Central Bank of Jordan, will continue to provide financial support to qualifying businesses.

The Committee for Entrepreneurship - that was formed by a decision of the Prime Minister in order to stimulate the environment of entrepreneurship in the Kingdom - support all economic sectors to meet the challenges facing the high demand by young people to establish small and emerging companies. This Committee, which headed by the Minister of Information and Communications Technology, is currently working hand in hand with the private sector towards a legislative framework dedicated for Entrepreneurial startups (the startup act).

With the objective of enabling ICT graduates to support SME and startups to participate in ICT projects, MoICT is in charge of 2 capacity building training program:

- Training 500 graduates of ICT majors on soft skills, English language and technical skills relevant to the needs of the labor market in cooperation with Al Hussein Technical University for three months.
- Training 500 graduates of ICT majors in private sector companies and official Jordanian universities for one year. (Graduate internship program)

To incentivize the ICT sector, the Government is committed to the tax exemptions adopted in 2016 to stimulate the IT sector's growth, attract new investments and to increase the number of jobs available in Jordan.

A Cabinet Decision no. 1/1/2016 identified a package of incentives for the ICT sector, as follows:

- Zero (0%) sales tax on IT services.
- Zero (0%) customs duties as well as zero (0%) sales tax of products if imported and bought domestically.
- 5% income tax of taxable income and imposing a zero (0%) sales tax on IT economic activities are sold/provided in Jordan.
- Up to Only 5% interest rate for IT activities soft loans from commercial banks.

Startup act:

Starting January 2019, MoICT in cooperation with World Bank, working on developing a legal framework for leading emerging companies to encourage and promote entrepreneurship in Jordan, ensuring an enabling environment for investment through effective cooperation with Jordanian start-up companies, entrepreneurs and the private sector. The main aim of the act:

- Developing a business environment conducive to the emergence and development of new pioneer companies.
- Promoting entrepreneurship in Jordan.
- Creating a conducive legislative environment for start-up companies to ensure their continued development in Jordan

Moreover, MoICT is transforming 80 knowledge stations into incubators to allow all entrepreneurs around the kingdom to startup their own business by providing a working space within the knowledge stations and providing all needed support accordingly.

Additionally, in 2017, the Ministry of Industry, Trade and Supply, Ministry of Municipal Affairs and the Secretariat of Greater Amman worked together to develop and modify the legislative and institutional framework of the "home-based business license" to include more careers/professions and all governorates of the Kingdom, Accordingly, instructions were issued regarding a license to practice business from home to enable starters to start their projects with low costs and financial burdens, unlocking new opportunities and encourage informal workers to work legally and transfer to the formal sector.

Two MoUs have been signed between MoICT and private sector companies to recruit ICT graduates to work remotely from the knowledge stations in their governorates of residence without the need to go to the company's headquarters, which is usually located in the capital Amman.

All the above actions aimed to increase competitiveness and enhance investments in ICT sectors. These actions are governed by the General Policy for the Information & Communications Technology and Postal Sectors (ICTP 2018) that was approved by the cabinet in March 2019.

Furthermore, there are two legal frameworks for investments in the ICT sector (including incentives and exemptions), as follows:

1. Investment Law No. 30 of 2014.
2. Cabinet Decision No. 1/1/2016 Dated 25/1/2016.

In addition to the aforementioned government efforts, the private sector has also many initiatives /projects that strengthens the investments in the ICT sector, the below shows some examples:

1. **Oasis500:** Leading seed investment company and business accelerator in the Tech and Creative Industry spaces based in Amman. Oasis500 enable great entrepreneurs to transform their viable ideas or creative talents into scalable businesses.
2. **Endeavor**: helps high-impact entrepreneurs unleash their potential by providing an unrivaled network of seasoned business leaders who provide the key ingredients to entrepreneurial success.
3. **Ipark**: specializes in enabling and accelerating the growth of startup companies through its effective incubation facilities, entrepreneurship programs, commercialization & intellectual property services, matchmaking opportunities with serious investors and unique industry networking events.
4. **Zinc from Zain**: it aims at providing support to the creative Jordanian youth and encourage them to participate in creating mobile applications that assist in transforming the government system into a mobile-based smart government system
5. **Tank from Umniah:** Umniah has dedicated itself to fostering a culture of entrepreneurship and innovation (The Tank) while simultaneously reinforcing its leading role in the country by creating an exceptional environment that motivates Jordanian entrepreneurs and nascent companies.
6. **Big by Orange**: targets established startups that are looking for mentorship as well as providing a fully equipped space to propel the growth of their businesses. BIG will help Jordanian startups expand into new markets and reach more customer segments.

For more information about Entrepreneurship ecosystem in Jordan, Visit https://tti-jo.org/

Regarding investment development and IT exports promotion, the Government requires the Jordan Investment Commission (IC) to develop and manage an export marketing program for the IT sector. With the support of IT associations and Jordanian embassies, this program will target countries where there is a shortage of IT skills, a need for the solutions sold by Jordanian IT companies and where there are opportunities for business process outsourcing. In addition, The Government requires the IC to continue to promote foreign direct investment in the IT sector. In this respect, IC may promote the particular advantages of Jordan as a skills center, a destination for call centers and for business process outsourcing and as a favorable location for national and international data centers. Also, the Government of Jordan supports the sector by exempting all IT exports revenues from income tax for ten years. This decision was adopted in the year 2015.

Moreover, Communications and IT services represent about 2.2% of FDI in clean technology projects, which suggests that there have been few major investments in ICT facilities such as data centers and telecommunications networks during the period from 2012 to 2016. Most of the Telecom investment is foreign. For example, the three telecom operators in Jordan are from France Kuwait and Bahrain. For the IT companies, main investors are from USA, China, India, and France.

To conclude, the attraction of major private national and foreign investments is only possible through the provision of a transparent, stable and predictable investment environment. Thus, the Government of Jordan provided several incentives to national and foreign investors by means of tax exemption and tax holidays for ICT companies under the Investment Promotional Law. Additionally, investors can benefit from special economic zones such as the developmental areas zones. Benefits include one-stop-shop services and investors' relation management units, among others. Investors can also have 100% ownership of their FDIs and fully repatriate their money with no conditions, which is in line with Jordan's liberalization policy and its commitments to the WTO. Furthermore, ICT exporting companies such as BPOs have also been exempted from income taxes to increase bilateral and multi-lateral export trade in ICT.

On another note, different innovative financing mechanisms were adopted to encourage building ICT networks and delivering ICT services. Examples include the strategic agreements and MoUs that the Government signed with several multinational corporations such as Microsoft, Cisco, Oracle and Huawei to develop ICT projects and enhance the ICT use and support local expertise and competencies in both the public and private sectors. Examples are given in the Public/Private Partnership (PPP) and Multi-Sector Partnership (MSP) section.

Venture capital investments are evident in Jordan. In cooperation with the Companies Control Department and the Jordanian Strategy Forum, some amendments have been introduced to the Companies Law. Subsequently, a new type of companies has been introduced, venture capital companies. Below are some of available Venture investments:

Al Arabi Investment Group Co.:

Al Arabi Investment Group Co. is an investment-banking firm that offers asset management, corporate finance, equity research, and securities and brokerage services. The company offers advisory services in private placements, corporate recapitalizations, mergers and acquisitions, joint ventures, divestiture mandates, fairness opinions and valuations, initial public offerings and bond offerings. It also generates macro-economic, equity research, and market brief commentary reports for Jordanian and Palestinian capital markets. The company was formerly known as Atlas Investment Group and changed its name to Al Arabi Investment Group Co. in January 2007. Al Arabi Investment Group Co. was founded in 1996 and is based in Amman, Jordan. As of January 1, 2004, Al Arabi Investment Group Co. operates as a subsidiary of Arab Bank plc.

Amwal Invest PLC:

Amwal Invest PLC provides investment banking and investment management services for financial institutions, corporations, governments, and high-net-worth individuals. The company offers asset management services, including fund management, portfolio management, and structured products. In addition, the company offers brokerage, business development, direct investments, and research services. It operates primarily in Jordan, Dubai, Abu Dhabi, Kuwait, Oman, Bahrain, Egypt, and Palestine. The company was formerly known as Portfolio Management and Investment Services for Clients and changed its name to Amwal Invest PLC in September 2008. Amwal Invest PLC was founded in 2005 and is based in Amman.

ISSF, Oasis500, Silicon Badia, Hikma ventures, beyond capital Wamda capital, Adamtech, MENA venture investments, Dash ventures, Mena Apps are some examples of local entities providing venture capital.

With regard to the stock exchange, only two ICT firms, Jordan Telecom and Al-Faris National Company for Investment & Export, are listed in the Amman Stock Exchange. Jordan Telecom is one of the ten largest on the stock market by market capitalization[13] and provides telecommunications and IT services. Al-Faris (otherwise known as Optimiza) is a medium-sized business that provides IT outsourcing and consulting services including training, software and corporate computer services. It also works as a distributor of computers and peripherals.

[13] Amman Stock Exchange Annual Report 2016

Ownership of listed companies by non-Jordanians has remained relatively constant at around 50% over the last ten years. However, ownership focus has changed with a substantial and continued reduction in foreign ownership in the services and industrial sectors since 2012, counterbalanced by a small increase in foreign ownership in the financial sector. The disproportionate effect of this increase is a consequence of the relatively large financial sector market capitalization compared to the market capitalization of the industrial and services sectors. The decline in foreign ownership in the industrial and services sectors has reflected the substantial decline in the valuations placed on these sectors evidenced by the decline in their price indices.

There are many success stories, proving the efficiency and the real support given for innovative companies in Jordan, below are two examples of success stories:

- In December 2018, The **Eureka Academy** was chosen as one of the top ten pioneer projects in the Arab world by the Arab Conference of Harvard University.
- Jordan's newly launched **Aoun** which has been able to stand out and win first place in the "Seed Stars" competition in its local version, is the first on demand mobile applications for home maintenance services in Jordan. **"Medical"**, which is specialized in electronic medical content in Arabic and telemedicine services, has been able to attract investments worth $ 6.5 million, which will help the Jordanian pioneer company expand and develop its services that are adapted to technology in the field of health care. “Medical” has acquired these investments from MEVP for bold investments and DASH Ventures, with the participation of strategic shareholders Rimco Investment, TAMM Investments, Endeavor Investment Fund and others.

B. Economic Impact of the ICT Sector (C12++)

1. Contribution of ICT sector in the national economy

Jordan’s ICT Revenues (in million USD) for the latest available years is as follows:

Revenues ()	2010	2011	2012	2013	2014	2015	2016
Telecom	1112	1153.4	1182.3	1095.5	1095.5	958.2	965.3
IT	522	529	450	460	460	441	482
ICT (Total)	1,634	1,682	1,632	1,556	1,556	1,399	1,451

ICT sector to the GDP in Jordan

Revenues	2008	2009	2010	2011	2012	2013	2014	2015
% telecom in GDP	3.4%	3.5%	3.6%	3.2%	3.1%	2.8%	2.5%	2.7%
% IT in GDP	0.2%	0.2%	0.3%	0.3%	0.2%	0.2%	0.2%	0.3%
%ICT in GDP	3.6%	3.8%	3.9%	3.5%	3.3%	3.0%	2.7%	3.0%

The development of a digital economy is dependent on the use of information and communications technology by individual Jordanians, the public sector and the private sectors of the economy. Therefore, the policy aims to facilitate the use of such technologies in all sectors and to revitalize Government’s own Digital Transformation Program by which it adopts digital technologies for Government administration, provision of government services and communication with citizens.

Government recognizes that the state of development of telecommunications in any country is a major contributor to that country’s competitiveness. More specifically, an efficient, capable and resilient national telecommunications network provides the essential foundation for the development of Jordan’s digital economy and of its evolving e-government services.

Furthermore, for the digital economy to develop in Jordan, the telecommunications services offered to the users in the Kingdom need to be affordable, universally available, secure and reliable. Affordability and universal availability of such services will ensure that all Jordanians are included in the digital economy and that the full range of e-government applications can be used.

In addition, for Jordanian start-up and innovative companies to be able to offer digital economy services, the telecommunications services which they use need to be offered in accordance with the net neutrality principle: telecommunications service providers treat all data on the Internet equally, and do not discriminate or charge differently by user, content, website, platform, application, type of attached equipment, or method of communication.

2. *Trade in ICT goods and services, and ICT-enabled-services (e-Trade)*

No information available.

3. *E-business*

While b2c e-commerce has not taken off in Jordan, around one quarter of establishments are buying or selling online. In 2016, 28.3% of establishments were aware of e-commerce, doubling the proportion since 2014, and 27.6% of establishments use e-commerce for buying or selling. Those are reported as not participating in e-commerce either because it is not important for business (32%) or through lack of security (24.4%) over the internet. A small number believed that it was difficult to link and configure systems or others did not have the confidence to buy and sell online.

The number of establishments reported as receiving orders online has increased by 63.6% between 2014 and 2016 with 86.7% receiving payments electronically. Around 37.1% of establishments buy through e-commerce and 85.6% of those establishments use electronic payments such as mobile payment.

Mobile payment services are run as separate units of mobile operators (e.g. Zain cash). Some of the banks are cooperating with the mobile payment companies. The following are connected to Jomopay: Jordan Bank, Jordan Commercial Bank, Arab Bank, Housing Bank, and four financial companies providing mobile payment services and financial solutions through mobile operators.

Merchants can set up wallet/account with several mobile payment providers. Individuals associate their phone number with their own wallet. There is nothing holding mobile payments up, all of the infrastructure is in place (including at post offices).

Individuals have to apply for a wallet to engage in mobile payments with Government. There is a transaction limit of 500JD set by Central Bank of Jordan, so some salaries could be paid using mobile payments. The slow uptake of the service is a question of awareness.

Overall, in 2016 there were just 8898 transactions valued at 198.8K JD.

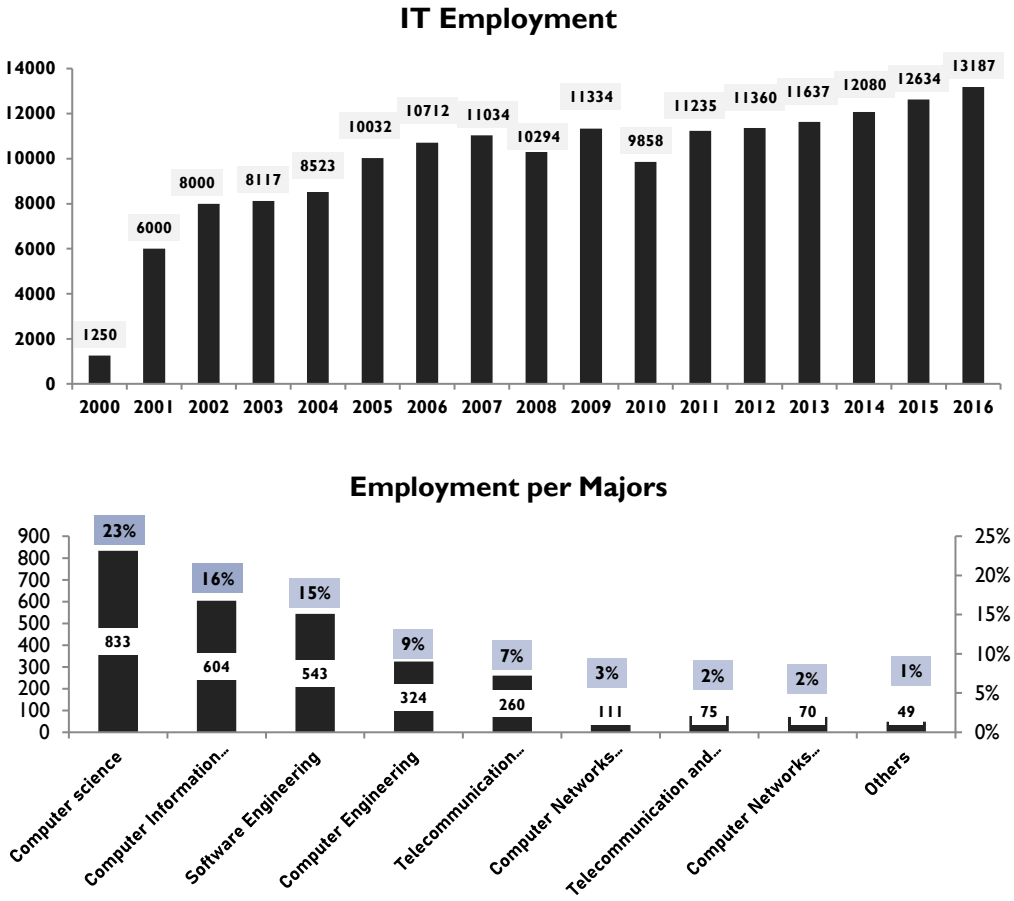
As all payment service providers are attached to Jomopay, interoperability is not an issue. Payments attract no charges as they are sent as OTT traffic. Acceptance by retailers is a major issue that needs to be addressed for mobile wallets to be useful.

Laws/services	**Available?**	**Law number**	**Year Passed**
e-banking services	*yes*	Electronic Payment and Transfer Bylaw No. 111 of 2017	*2017*
e-commerce law	*yes*	The Electronic Transaction Act No. 15 of 2015	*2015*
Name other laws on e-services			

4. *Employment in the ICT sector*

Despite the year by year growth in Jordan in the number of mobile and internet subscribers since 2000, it is notable that the level of employment attributable to the sector, although significant, has fallen considerably over the last five years.

In the last three years IT employment has been growing with an average of 4% on yearly basis, as shown below;



Average number of ICT (BA) graduates on yearly basis for the last three years is around 4,131

The employment percentages are:
2015: 33.4%
2016: 39%
2017: 39%

Many serious scientific studies confirm that many existing jobs will disappear in the future. Automation will have a clear impact on the current job situation. The fact is that technology will create more jobs than it will destroy since many of the current jobs will vanish, and technology will contribute directly to the creation of new jobs.

Throughout the world, ICT is transforming the labor market, creating new jobs and making labor markets more innovative, inclusive and global. ICT affects employment as an industry that generates more jobs and as a tool that enables workers to acquire new types of work in new and more flexible ways. New and ICT-based opportunities are important in that the various countries of the world are seeking to create more good jobs with a positive social and economic impact on employment and society.

Technology is a driving force in job creation and makes labor markets more innovative and comprehensive. This is reflected in several aspects, the most important of which is entrepreneurship, which is growing rapidly and parallel to technological progress. Entrepreneurs have become able to realize their dreams and execute their projects through intelligent information programs or applications. In addition, technological development has contributed to the creation of employment opportunities through the emergence of new economic activities such as poles and technological incubators, information centers, call centers, e-learning institutes, e-security institutions, scientific and technological parks, social networking sites. Despite technology threatens jobs with extinction, it creates daily opportunities for employment and even unleashes viable sectors of the economy.

This is in line with the vision of the National Strategy for Digitalization of the Economy (Reach 2025), "Access to a digital economy that enables people, sectors and companies to increase their productivity and

achieve growth and well-being, creating a destination for investment and international cooperation". This is based on Jordan's strengths and opportunities by focusing on the four main themes were innovation, entrepreneurship, government digitization and skills upgrading.

The Jordan 2025 document is expected to achieve an increase of 6-8% in Gross domestic product, an increase in job opportunities between 13,000 to 15,000, an increase in revenues of between 25-30% for the digital economy and 5,000-7,000 new companies operating in the digital economy.

5. *E-employment*

In Jordan, advanced steps have been taken to use ICT as means to locate employment (such as, Internet, broadcast SMS, announcements via social and professional networks). Below are some examples:

Civil Service Bureau (CSB) supports employment by using a website, which provides many services such as from applying through electronic job application forms[14], and announcing job vacancies for public, private sectors and international jobs. CSB uses broadcasting SMS to inform the dates of exams and interviews. CSB has an Android application to inquire about the application status. It also uses e-mails and social media to communicate with the service recipients.

CSB also provides e-services, such as using employee card system[15], HRMIS and the applicant order systemCSB also enables hearing-impaired people to communicate with the Bureau in all its branches through the screens and the specialized techniques prepared by one of the telecom operators, Zain Jordan, which provides the interpretation through a video conversation in the sign language to inquire about all needed information. . With regard to the availability of national databases of resumes. CSB provides a web-based HR system and a national database for resumes and handling the full employment cycle for the citizens.

As mentioned in previous section, the Government worked to develop legislative and institutional framework of the “home-based business license” to include more careers/professions and all governorates of the Kingdom, Accordingly, instructions were issued regarding a license to practice business from home to enable starters to start their projects with low costs and financial burdens and unlocking new opportunities. In addition, two MoUs have been signed between MoICT and private sector companies to recruit ICT graduates to work remotely from the knowledge stations in their governorates of residence without the need to go to the company’s headquarters.

IV. Cluster Four: Digital Transformation and Social Inclusion Policy Areas

A. Inclusive and Empowering Access to relevant information, knowledge, applications and Content (C3)

1. *Inclusiveness (access): Availability, Development, Affordability, and Adaptability*

Broadband Internet access is available in most areas of Jordan, though there are affordability issues that impeded the uptake of broadband internet services. The table below indicates that only the more affluent households can afford the fixed lines or smart phones required to access the Internet[16].

[14] http://enq-sys.csb.gov.jo/

[15] http://www.csb2.gov.jo

[16] Source: Jordan household survey 2017

Table 4-1: Penetration of telecommunications services by income band

	Average Monthly Household Income (JD)						
	Less than 100	**100 – 199**	**200 – 299**	**300 – 399**	**400 – 599**	**600 – 999**	**1000 +**
Urban							
Fixed telephone	4.6%	8.2%	7.2%	8.8%	13.4%	18.4%	39.5%
Smartphone	27.1%	42.1%	67.2%	82.2%	93.5%	96.3%	99%
Rural							
Fixed telephone	0%	1.3%	1.9%	1.4%	2.5%	5.8%	24.3%
Smart phone	18.9%	42.3%	61.5%	73.2%	90.2%	95.6%	98%

The availability of local loop unbundling has been demonstrated to increase the availability of innovative broadband products and reduce the price of broadband services in many of the countries where it is provided. The most likely reason for this is that unbundling of the local loop was implemented too late for the market and the cost of providing ADSL was not seen as attractive when fiber is in the process of being installed.

Use of the internet is increasingly dominated by social networks and chat service. The only other growing high usage service was health services and information. Other high use services that were falling were games, newspapers, email, music and other media. The declines were modest in media services. Low usage included goods and services, jobs, banking, training and e-learning. These showed mixed results and did not demonstrate the uptake in e-commerce and electronic financial services found in some equivalent markets.

Table 4-2: Access to and use of the Internet

	Urban		**Rural**		**The Kingdom**	
Factor	**2016**	**2015**	**2016**	**2015**	**2016**	**2015**
Percentage of individuals who used the Internet	55.6	48.4	57.5	49.4	46.6	43.7
Percentage of individuals who used the Internet during the previous 12 months:						
At home	87.6	97.0	69.5	92.3	85.0	96.3
At work	9.9	11.8	7.2	12.4	9.5	11.9
At internet cafes	1.1	2.8	0.6	0.9	1.0	2.5
At schools and universities	9.9	14.0	11.8	16.2	10.2	14.3
At Jordanian Knowledge Stations	0.2	0.3	0.4	0.6	0.2	0.3
At an association or civil organization	0.0	0.5	0.5	0.0	0.1	0.4
Using a smartphone or tablet	96.7	95.8	95.2	94.0	96.5	95.5
Anywhere else	1.3	0.8	2.2	3.7	1.4	1.3
Percentage of individuals who obtained information or services over the Internet during the previous 12 months about:						
Goods and services	6.3	5.2	7.0	8.5	6.4	5.7
Health services or health information	40.8	37.8	40.5	38.9	40.7	37.9
Jobs	10.4	11.1	11.9	11.7	10.7	11.2
Sending and receiving e-mail	54.1	63.9	45.8	49.4	52.9	61.7
Chat services	84.0	83.0	79.5	75.6	83.4	81.9
E-Learning	2.0	3.9	2.8	2.9	2.1	3.7
Training purposes	9.2	11.4	6.6	13.3	8.8	11.7
Purchase and sale of goods and services	1.5	1.4	1.0	0.3	1.4	1.2
Banking services	3.1	4.4	5.1	4.5	3.4	4.5
Information from government institutions	5.7	6.0	7.9	10.6	6.0	6.7
E-government services	2.4	3.9	3.8	4.9	2.6	4.0
Cartoon Games Services	53.3	63.2	53.3	63.8	52.9	63.3

	Urban		Rural		The Kingdom	
Services of listening to music and watching movies and television programs	68.1	70.9	64.4	69.1	67.6	70.7
Services of reading newspapers and magazines cartoon	60.4	62.2	56.5	63.9	59.8	62.4
Social media sites Facebook, Twitter	93.5	89.0	93.5	82.2	93.2	88.0
other information	2.6	2.6	3.0	8.5	2.7	3.5

The "Knowledge Station" Initiative is intended to enable all segments of the Jordanian society, irrespective of their geographical location or economic status, to participate in the digital economy by providing access and training in the ICT and other skills necessary to participate. Particularly, it supports marginalized groups such as women, the underprivileged and underserved, children, laborers, farmers, and the illiterate. The majority of these communities reside in the rural and remote areas of Jordan, where access to ICT is difficult to obtain. Knowledge Stations have been primarily established in less developed, information poor areas with the task of leveraging the power of information and communication technologies as a mean for improving their social and economic conditions. Knowledge stations provide training principally in IT, internet access, access to e-government services and printing and scanning services. In 2017, knowledge stations started to receive electronic applications for teaching diplomas, and employment, and also started to provide electronic education services. Certificates are issued by NITC and also by a Development Company, Microsoft and Cisco for their courses.

To date, the Knowledge Station initiative has successfully established 196 stations throughout Jordan. In the first half of 2017, over 60,000 individuals used knowledge stations and 7.500 individuals were trained in 1,250 training courses. A further 50,000 individuals used knowledge stations in the subsequent four months to the end of October 2017. Knowledge stations are also used for awareness program in 18 knowledge stations.

The Knowledge Station Directorate is training post office workers to provide knowledge station services via the 320 post offices. The plan is to train 830 people. 220 have already been trained. Also, the plan was to train 300 new graduates to develop e-government services to be provided at post offices. The trainees will be expected to work from urban and rural post offices and establish start-ups that would be involved in setting up e-government and other services at the post office.

In addition to the free internet access provided in knowledge stations, telecom operators offering free of charge wireless internet (Wi-Fi) services in several public locations and touristic sites in the kingdom, which enables the site visitors to enjoy high speed internet. The public locations selected by Zain[17] according to the population percentage and number of visitors, where these locations are considered “Hot Spots” that provide free Wi-Fi internet in Down Town, Abdoun, Shmeisani, Um Uthaina, AlRabyeh in the archaeological sites in Jerash in addition to the Babtism site in Madaba. Zain has previously provided free wireless internet services in Rainbow Street, Wakalat Street, North Gate at Jordan University and in the premises of King Hussein Business Park. More All public buses work for Amman city providing free of charge internet access for passengers.

It is worth mentioning that Telecomm Regulatory Commission formed a working group in 2018 to implement initiatives and projects directed at the group of persons with disabilities and facilitate their access to ICT means and services. The group is headed by the Commission and the membership of the Supreme Council for the Affairs of Persons with Disabilities, Jordan Mobile Services Company (Zain), Petra Jordan Mobile Telecommunications Company (Orange Jordan) The Jordanian Coalition for People with Disabilities and the Cultural Forum for the Blind, as well as representatives of both hearing disabilities, visual disabilities and motor disabilities.

The private sector also played a role in this regard. Zain website (www.jo.zain.com) is supported by virtual translator for 3D Deaf. This default translator feature enables Zain to translate the content of the Zain website

[17] www.jo.zain.com

in Arabic and English into sign language for the Deaf category so that they can browse the site and view the contents of Zain's services and offers. This step is in line with Zain's plans to meet the needs of all Community segments and access to them, to keep them in constant contact with each other according to the latest technology.

2. *Empowerment (use): Educational, Entertainment, Political Engagement, Economic Returns*

No information available

B. Capacity building on ICT4D/Digital Development (C4)

1. *ICT in Education and Training (including e-Learning)*

A. BASIC LITERACY

Everyone should have the necessary skills to benefit fully from the Information Society, therefore, ICT4D capacity building is essential. ICTs can contribute to achieving universal education worldwide, offering improved conditions for lifelong learning considering the needs for both men and women and increasing the engagement in social political life.

Jordan took early steps in using ICT as a tool for basic literacy, in this regard, there are many initiatives and projects, below are the main ones.

B. PRIMARY AND SECONDARY EDUCATION

All high schools in Jordan have one or more computer laboratories, with 16 to 20 pcs, which are available to particular classes at certain times. About 1350 elementary schools do not have a computer laboratory.

There are interactive white boards in 500 schools for grades 1 to 6, with 1350 schools with interactive white boards overall. Some schools have intranets connecting to the Education network. Some schools have wireless connectivity within the school.

There is a special IT budget for schools originate with the World Bank and USAID. When one of these organizations builds a school, they also provide the IT. However, because the Education Department is only peripherally involved this approach results in different IT standards in each school making integration and common solutions difficult to provide over the top of the basic infrastructure.

Each school has an assigned person responsible for support and maintenance. In small schools the IT literacy teacher covers these roles. In addition, there are 5-7 engineers in each field directorate to provide second line for maintenance. Overall, there are around 68,000 modern desktop computers in schools.

The Ministry of Education's Vision 2023 identifies the following targets to be achieved by end of year 2023

- Use of a learning management system across schools;
- Online education resources available to all schools;
- Project based learning and IT embedded in learning;
- Smart classroom – at least one in each school;
- Education games on smartphones for science and mathematics;
- Interactive books for science and mathematics on smartphones;
- Online education for grade 12, mathematics, physics, chemistry, available for all Arabic speakers.

In Jordan, many initiatives have been taken to digitize schools and education system, below are some of these:

1- Smart Classroom Pilot

About 20 schools are participating in a **smart classroom pilot**. There is a shortage of funding of the project, where basic infrastructure takes priority over IT.

2- Open Education Management Information System EMIS

EMIS has been implemented with support from UNESCO[18]. This system aims to provide reliable national information to support evidence-based education policies and plans. It falls under SDG 4, which aims to "ensure inclusive and equitable quality education and promote life-long learning and opportunities for all". The system based on open source and generic toolkit has been rolled out at schools.

3- Education network

Schools are linked via a broadband network provided by Umniah, Orange and the NBN. The Orange components, which provide broadband at 1-2 Mbps, are being replaced by Umniah using point-to-point microwave network offering 15 – 50 Mbps access. This switch-over will be completed by end 2017.

By end 2019, the NBN will cover about 1800 schools and therefore will leave gaps requiring the use of commercial services. Umniah's project provides video conferencing and VoIP between sites in addition to the OMIS system.

4- Edraak, is a massive open online course (MOOC) platform It is an initiative of the Queen Rania Foundation (QRF). QRF has capitalized on regional Arab talent to leverage technology developed by the Harvard-MIT consortium, edX, to create the first non-profit Arabic MOOC platform. The MOOC platform will present to the Arab world unique and vital opportunities that can be part of a necessary revolution in education and learning.

The platform broadcasts the best Arab professors to the region, offering original Arabic courses to further enrich Arab education. Through its partnership with edX, the platform will also give Arab learners access in Arabic to courses taught and developed at top-tier institutions like HarvardX, MITX, and UC Berkely. All courses are delivered at no cost to the learner.

On the other hand, EDRAK provides free online educational lessons aligned with the national curricula for K-12 grades.

5- Jordan Education Initiative (**JEI) educational model**: aims to develop technologically savvy schools that arm their students to meet the digital economy requirements. The model is built on five pillars:

- **Enhancing technological infrastructure**: JEI provides both hardware and software to its participating schools, including computer labs, in-classroom technology, connectivity and e-curricula.
- **Capacity building**: JEI promotes effective, technology-enabled lessons by equipping educators with the requisite skills, including:
  - **Induction workshops** for school management, teachers and the community to explain the JEI educational model
  - **Change management training to** equip teachers to define the school's vision, design and plan projects and systematically monitor and evaluate those projects to facilitate change
  - **Interactive whiteboard pedagogy training** on the effective use of different tools and integrating them into the classroom
  - **21st Century teaching and learning training** building the capacity of teachers in ICT literacy, research skills, collaborative work, critical thinking, project-based learning and the use of social media to create student-led teaching and learning
- **E-Resources**: JEI has developed electronic curricula in six subjects (e-math, e-science, e-English, e-Arabic, e-ITC, and e-civics). These are used in the classroom to enrich the learning process through a blended methods approach.
- **Sustainability**: JEI transfers lessons learned to the Ministry of Education and encourages the Ministry's ownership over JEI interventions.

[18] "UNESCO and the MOE celebrate the launch of the EU funded "Enhanced OpenEMIS" in an effort to produce better data on Jordan's education system", UNESCO office in Amman, 30th August 2016;

- **Monitoring and Evaluation:** Implementation of the JEI educational model adheres to a results-based monitoring and evaluation system targeting students, teachers and principals. The most suitable qualitative or quantitative methods are used depending on the type of intervention.

C. HIGHER EDUCATION

Higher education network

The higher education network was built in 2004 using Optical Ground Wire (OPGW) over the NEPCO transmission network. There is an IRU between NEPCO and a non-profit university network company - JoNET. MoICT implemented the last mile solution with underground fiber cabling to the nearest power station. MoICT also provided the switches and the data center. It is a 1Gbps network.

Atheer Centre at the University of Jordan offers a video Conference service that enables universities, ministries and government institutions to communicate to hold joint lectures on different topics, and to hold conferences, seminars and joint scientific workshops between universities and institutions through interactive video communication system.

D. TRAINING AND OTHER FORMS OF EDUCATION

Fursati Liltamayyoz (means 'my opportunity to excel and standout' in Arabic): This is JEI's yearlong internship program for recent ICT graduates. By preparing and introducing interns to the labour market, the program bridges the gap between the outcomes of the education system and needs of the labour market. Interns provide elementary and secondary schools with technical support to help to integrate technology into learning with the aim of transforming them into ICT community hubs. The internship comprises five phases:

- Orientation and soft-skills training
- A placement at a school with the JEI educational model for two semesters
- Technical training to further develop their ICT skills during the winter break
- On-the-job training for three to four months with a public organization or private company
- ongoing mentorship throughout all the phases of the internship

Furthermore, the National Information Technology Center (ITC) and the Jordanian National Committee for Women signed a Memorandum of Understanding (MoU) to provide training courses for 2,000 women from different parts of the Kingdom. According to the memorandum, ITC will provide training courses in the field of information technology through the Center's 196 knowledge stations spread throughout the Kingdom. Knowledge Stations provide opportunities for women to participate in economic and social development through the rehabilitation and development of their skills and to prepare them to deal with the tools of technological development and uses. In addition, special training sessions will be held on the protection of women from cybercrime to enable women to use information technology in a wide range, which opens the way for working remotely through the internet and contributes directly to economic empowerment.

2. Targeted Training programmes (for capacity building on the use of ICT4D)

No information available.

C. ICT applications (C7)

ICT thematic applications can support sustainable development, in the fields of public administration, business, education and training, health, and employment, within the framework of national e-strategies. The ICT applications could be back-office applications, Web-based or mobile applications.

1. E-Government

- **Computerizing Public Administration**
  Most of governmental entities in Jordan have adopted computerized internal systems to automate the workflows and provide citizens with standardized governmental services.

- **Computerizing customs processing**
  Jordan Customs is considered a pioneer in the field of digital transformation. It had delivered and launched most of its services electronically.
- **Computerizing taxation and revenues management systems**
  E-Government of Jordan had implemented centralized applications and solutions to manage taxation and revenues. For example, ISTD had launched 3 of its electronic services for taxes declaration and payment, municipalities had already implemented centralized solution for taxes and a national project for Government Financial Management Information System (GFMIS) and many other examples.
- **Digitizing Information**
  One of the most field of interest for the Government of Jordan is the adoption of a national strategy to provide decision makers with the needed digitized information that is collected among different sectors. This is in order to achieve this objective, the E-Government of Jordan has launched the Decision Support System and a National Data warehouse project.
- **Engaging with all citizens**
  The E-services launched by the E-Government program is allowed and accessible to all citizens through web and mobile phones. Feedback and participation from citizens is collected through all available channels, mainly the national government portal which is enriched with collaboration tools. The payment gateway **(eFawateercom)** offers the ability to pay for all services and through multi channels, which guarantee the accessibility to all citizens.

Moreover, a wide range of e0government services are provided in Jordan, includes:

- **G2G (Government-to-Government) interaction between local and central governments:** Available through the Government Service Bus (GSB), which allows for secure transaction between government entities to complete the cycle of e-services. Currently there are 55 published web services.
- **G2C (Government-to-Citizen) delivery models and government portals:** The government portal (www.Jordan.gov.jo) provides the platform to publish e-services and many other services like location-based and Open Data. There are currently 186 end-to-end transactional services published on the government portal and governmental entities portals that are targeted to citizens and business. Furthermore, E-Government has improved its portal to enhance the accessibly feature through providing reading tools and videos that are targeted to people with disabilities. Having said that, a report on the evaluation of governmental and official websites, which included the evaluation of 48 websites until February 2018, shows that in spite of the development in the governmental official websites and the improvement in the services provided electronically, only 23% of these websites do support persons with disabilities.

- **G2B (Government-to-Business) interaction between local and central government and the commercial business sector:** The business enablement platform that the Company Control Department has launched end of 2018 covered the establishment of businesses and the sectorial licenses. Also, Jordan Investment has launched a national program to promote investment and business in Jordan through a portal that offers all services needed to start a business and get the exceptions.

Name of Authority in Charge of ICT in Public Administrations	English Name: The Ministry of Information and Communication Technology Arabic Name: وزارة الاتصالات وتكنولوجيا المعلومات URL: www.moict.gov.jo
Name of e-Government authority	English Name: E-Government of Jordan Arabic Name:برنامج الحكومة الالكترونية URL: www.Jordan.gov.jo
Number of implemented government e-services	239 e-services as of April 2019
Number of planned government e-services	157 services from May 2019 till the end of 2020

There is also a national application for e-Procurement. It was adopted and launched by the General Supply Department in late 2017 to provide an automated system to apply for governmental tenders and submit the technical proposals.

URL of e-government portal: *(http://www.Jordan.gov.jo)*		
Information	General	*Yes*
	Laws	*Yes*
	Directories	*Yes*
Services	Static Info	*Yes*
	Downloadable Forms	*Yes*
	Interactive	*Yes*
e-payment		*Yes*
Online account		*Yes*
Bilingual		*Arabic & English*
Citizen Participation	Blogs	*Yes*
	Polls	*Yes*
Social Media	Facebook	*Yes*
	Twitter	*Yes*
	LinkedIn	*Yes*
	YouTube	*Yes*
	Other	
Additional Services	RSS	*Yes*
	Web Statistics	*Yes*
	Search	*Yes*
Mobile version	Support for smartphone/tablet	*Yes*
	Dedicated App (iOS or Android based)	*Yes* *Through dedicated applications for e-services*
Other features		*Location based services* *Rich Collaboration Tools* *Advanced Search capabilities* *Open Data Platform* *Daleel*

2. E-health

Regarding the availability and access to the world's medical knowledge and locally relevant content resources in Jordan, the Ministry of Health achieved the following:

1. The annual publication of the statistical report of the Ministry of Health for all health sector in the Kingdom.
2. Developing the website of the Ministry and the electronic websites of all the directorates and hospitals
3. Developing planning tools for health resources and publish them on the website.

4. Developing The website of the health map where the distribution of all sites of service delivery from hospitals and health centres with health indicators associated with them.

Remote health care is available in Jordan among three hospitals: Queen Rania Wadi Mousa Hospital, Government Mafraq and Prince Hamza Hospital.

The Ministry of Health's services will be transferred to electronic services, in addition, a nurse, legal and pharmaceutical license service will be launched soon.

Regarding to patient care management, digital record keeping & databases for national healthcare topics, The Ministry of Health worked on:

- Computerization of 20 hospitals and 151 health centres through Hakim program (explained below) by the Department of Patient Care;
- Maintenance of the patient's digital record;
- Health management of medicines and the existence of a database of health services;
- Re-engineering the procedures of health insurance services.

Moreover, The Ministry of Health established interactive electronic reporting system for diseases in hospitals and health canters (coverage of 75% and will be increased to 100%).

In 2009, Jordan began implementing Hakeem national e-health records programme. This programme, implemented by the Jordanian non-profit organisation Electronic Health Solutions, creates a database of patients' medical records, including the diseases they suffer from and all tests and procedures they have undergone. The system links patients to their national ID number and is also designed to help future research and statistical analysis.

V. Cluster Five: Culture and Media Policy Areas

A. Cultural identity and linguistic diversity (C8)

Cultural and linguistic diversity, while stimulating respect for cultural identity, traditions and religions, is essential to the development of the Information Society. Digital content, particularly on the Internet, preserves the language, facilitates its evolution and promotes cultural diversity while sustaining socio-economic development. In addition, digital content development can play a major role in preserving the national heritage.

Use of ICT in support of cultural and linguistic diversity

The Department of the National Library in Amman, is Amman's main public library and the government's centre for processing its documents for archival purposes. the Department has a selection of government documents, dating from independence until the late 1980s and, these documents are also accessible online.

B. Media (C9)

The media sector and its various and diverse forms are part of the digital world that encompasses all sectors of the economy. The Media systems have an essential role in the development of the information society and are recognized as an important contributor to press freedom and plurality of information.

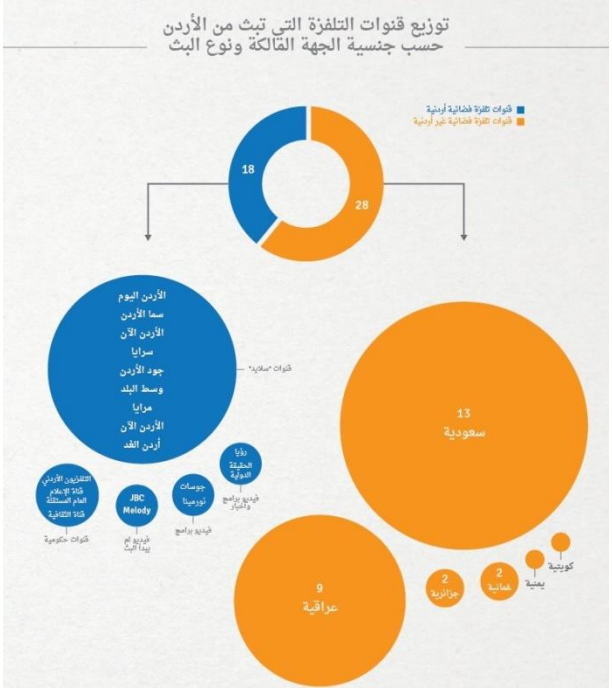
1. Media diversity, independence and pluralism

The Jordanian media landscape is diverse in terms of ownership of the media. Government laws, regulations and policies governing public information recognize two types of property, where public and private sectors share ownership of the media.

The Media and Audio-Visual law No. (26) of 2015 with the Press and Publications law No.(4) of 2015 enabled the private sector to invest in the ownership of the visual and audio-visual media, namely, satellite channels, earthworks and radio stations. The two laws authorizing the licensing of the media and publications.

Government sector ownership is present in different media sectors. In the visual media sector, the government, through the Radio and Television Corporation, has two terrestrial channels in Jordan, three satellite channels and one news agency in Jordan, Petra. In the newspaper sector, the government is the main contributor to three out of seven daily newspapers. It owns 55% of the Jordanian Press Corporation which publishes two newspapers; one in Arabic (Al-Rai), and the other is in English named (Jordan Times). The government also owns 35% of the shares of the Jordanian Press and Publishing Company, which publishes the newspaper (Constitution).

The Jordanian private sector owns 15 licensed channels; 9 of which are slide channels, (i.e. fixed images, music recordings, and an advertisement or news bar, without programs or news). It also owns 24 local radio stations.



There are about 300 privately owned e-news sites, these sites remain very weak, prone to closure and unable to cope with the evolution of the Internet and its evolving media. The table below indicates the number of media outlets in each category:

Media outlets	Language(s)	Ownership			
		Private	Mixed	Government	Foreign
Newspapers	Arabic and English	28		3	
Electronic newspapers	Arabic and English	181			
Magazines	Arabic and English	836	5	16	
News agency	Arabic and English			1	
Radio stations	Arabic and English	39		15	3
Television stations	Arabic and English	35		2	

The only government support for the sector goes to community radio stations through exemption from licensing fees imposed by the Media Commission. For the sake of ensuring the freedom of speech and to

avoid any governmental control on the media sector, there is no government support to be extended to any other media institutions and reporters.

Article 15 of the Jordanian Constitution establishes a constitutional obligation to guarantee the freedom of expression and opinion for Jordanians. Information dissemination is the core of the media sector in Jordan, where it is believed that the free, independent and pluralistic media on all platforms are important to facilitate good governance and transparency.

It is worthwhile mentioning that among the roles of the Jordan Media Commission is the granting of licenses, whereas the blocking of any electronic websites is only done through judicial order, therefore the freedom of and plurality of information is highly supported and secured.

A recent study issued in 2018 on "Promoting balanced and equitable coverage of the social roles of women and men in the content of the Jordanian media" concluded that there is a gender gap in the media in the public and private sectors (print, electronic, audio, video). The percentage of women appearing in the media was 9%, while the percentage of women in television and websites was 6%, in radio stations was 13% and in newspapers and Jordan news agency was 10%. The general results of the study sample showed that one woman for every 10 men was mentioned or quoted or interviewed in all the media, and that there is only one woman out of every 3 journalists working in the media.

Another study on "Evaluation of the Status of Female Journalists in Jordanian Media Institutions" issued at the end of 2018, by the International Media Support Organization in cooperation with the Jordanian National Commission for Women, indicated that the proportion of women journalists in the media reached 23% and that they suffer from multiple obstacles in the field of work.

Even though Jordan lacks gender-sensitive media policies and strategies, the media in Jordan has an effective and influential role in protecting human rights in general and women's rights in particular and addressing any violation of these rights through advertisement, scripts or talk-shows.

Although men dominated leadership positions and editorial positions, many women were able to acquire a distinguished presence as media figures and editors in the printed and broadcast media. For example, the portfolio of the Minister of State for Information and Communication Affairs and the official spokesperson for the Jordanian government is held by a woman, before assuming this position, she was the editor of one of the official newspapers.

2. The media and its role in the Information Society

The media plays an absolutely central role in the development of a knowledge-based society. A free and pluralistic media (public, private, community) is essential for transparent and accountable political system. It must be confident, vibrant, entertaining, surprising, pro-active, balanced and informed.

Regular media provides a one-way communication, where viewers and receivers of the information can't give feedback but, on the other hand, social media is a two-way communication that gives users the ability to communicate and express their views immediately.

Currently, there is no national policy or strategy for the use of social media by government organizations.[19] However, E-government Jordan has its own page on Facebook, which is actively used and makes announcements via Twitter as well. All governmental entities have an account on the social media channels. Moreover, the ministers' personal accounts have been used lately to provide information and collect feedbacks on the government decisions.

"Hagak Teraf" "حقك تعرف" is an official electronic platform to verify the information, which aims to provide accurate information to media followers in general, and social media in particular to prevent the transmission of rumors, and combat misinformation. This platform is part of a comprehensive information campaign aimed at countering the "tsunami" of misleading and false information on social media sites.

[19] Jordan, World Health Organisation, 2016; www.who.int/goe/publications/atlas/2015/jor.pdf

3. *Convergence between ICT and the media*

The convergence of IT, media and telecommunications (enabled by next generation networks) will require operators to examine their competitive position and regulators to revise the way in which they control the market, especially with regard to net neutrality.

To ensure that all services delivered over telecommunications networks are regulated in a consistent and appropriate manner and that there are no regulatory loopholes that can be exploited, the Policy of 2018 requires the MoICT together with other parties concerned to review the applicability of the measures in the Green Paper on Convergence [20] against current and anticipated conditions in the media and telecommunications services markets as well as international best practice. Having reviewed the Green Paper and made appropriate changes, the MoICT will determine what changes, if any, are needed to telecommunications and media laws and regulations.

Meanwhile, the Policy requires technology neutrality to be applied to new spectrum assignments for use in the provision of public telecommunications services by licensed operators. TRC to investigate how technology neutrality for the assigned spectrum can be introduced in a fair and non-discriminatory manner. The introduction of such technology neutrality would minimize the possibility of obsolescence and hence inefficient use of particular bands as service usage changes.

4. *Social Media in the Arab World*

In Jordan, the social media has played a two-sided role in the information society. On one side, the social media played a negative role by causing the emergence of identity theft cases, the promotion of false rumors, racism and extortion issues. On the other hand, it has played a major positive role in preservation of the security of the country and political issues like the events and crises that Jordan has passed through, such as Jerusalem and the events of Karak and Bakoura.

[20] The Green Paper on the Convergence of Media and Telecommunications in Jordan, the result of a twinning project between the Commission and the European Union, JO10/ENP-AP/TE/13

Appendix 1

Table 1 - Core indicators on the ICT (producing) sector

Core indicator		Definitions and notes	2015	2016	2017
ICT 1	Proportion of total business sector workforce involved in the ICT sector (expressed as a percentage)	*ICT workforce* (or ICT employment) consists of those persons employed in businesses that are classified as belonging to the ICT sector. *Total business workforce* represents all persons engaged in domestic production in the business sector. In a national accounts framework, employment can be measured in terms of headcounts, jobs, full-time equivalents (FTE) or hours worked. For countries using ISIC Rev. 3/Rev 3.1 (or national equivalents), the ICT sector is defined per the OECD's 2002 definition. This can be found in Box 1 and is discussed in detail in OECD (2007). For countries using ISIC Rev. 4 (or national equivalents), the ICT sector is defined per the OECD's 2007 definition. This can be found in Box 2 and is discussed in detail in OECD (2007). The total business sector is defined on an activity (industry) basis per ISIC Rev. 3.1 as divisions 10–67 and 71–74. It therefore excludes: agriculture, hunting, forestry and fishing; real estate activities (because a significant proportion of the value added of the latter consists of imputed rent of owner-occupied dwellings); and, community, social and personal services (which consists mainly of non-market activities such as public administration, education and health services). For countries using ISIC Rev. 4, the total business sector is not so easily defined. It will most likely include the equivalent divisions 05 to 36, 41-66, 69-82 and 95. Discussions are ongoing on whether it should include some industries that were not included in the Rev. 3.1 definition of the total business sector (divisions 37-39, 90-93 and 96).[21]	N/A	N/A	N/A
ICT 2	ICT sector share of gross value added (expressed as a percentage of total business sector gross value added).	*Gross value added* for a particular industry represents its contribution to national GDP. It is sometimes referred to as GDP by industry and is 3not directly measured (but is estimated in a national account framework). In general, it is calculated as the difference between production (gross output) and intermediate inputs (the energy, materials and services required to produce final output). Definitions of the ICT and total business sector are per ICT1.	3%	-	-

[21] See draft ISIC Rev. 4: http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27.

Table 2 – Core indicators on international trade in ICT goods

Core indicator		Definitions and notes	2015	2016	2017
ICT 3	ICT goods imports as a percentage of total imports	*ICT goods* are defined per the OECD's 2003 ICT goods classification, based on the 1996 and 2002 Harmonized System classification. It can be found in UNCTAD (2007). Other concepts are per the *UN COMTRADE* database e.g. re-exports and re-imports are not netted out, and data are presented in US dollars (converted by the UN from country currencies).	N/A	N/A	N/A
ICT 4	ICT goods exports as a percentage of total exports	*ICT goods* are defined per the OECD's 2003 ICT goods classification, based on the 1996 and 2002 Harmonized System classification. It can be found in UNCTAD (2007). Other concepts are per the *UN COMTRADE* database e.g. re-exports and re-imports are not netted out, and data are presented in US dollars (converted by the UN from country currencies).	N/A	N/A	N/A

Table 3 - Core indicators on ICT in education

Core indicator		Definitions and notes	2018
ED1	Proportion of schools with a radio used for educational purposes (by ISCED level 1 to 3)	Schools offering radio-based education as a percentage of the total number of schools in the country for each ISCED level (1-3).	Not Applied
ED2	Proportion of schools with a TV used for educational purposes (by ISCED level 1 to 3)	Schools offering television-based education as a percentage of the total number of schools in the country for each ISCED level (1-3).	Not Applied
ED3	Proportion of schools with a telephone communication facility (by ISCED level 1 to 3)	Schools with telephone communication facilities as a percentage of the total number of schools in the country for each ISCED level (1-3). Note that the facility should be directly associated with the school. For instance, a mobile phone which is owned by an individual working at the school would not constitute a school *telephone communication facility*.	Voice over IP 77%
ED4	Student-to-computer ratio (by ISCED level 1 to 3)	Average number of students per computer in schools that offer computer-assisted instruction (CAI) by each ISCED level (1-3).	13:1
ED5	Proportion of schools with Internet access, by type (by ISCED level 1 to 3)	Schools with access to the Internet as a percentage of the total number of schools in the country for each ISCED level (1-3).	78%
ED6	Proportion of students who have access to the Internet at school (by ISCED level 1 to 3)	Total number of students with access to the Internet in schools as percentage of the total number of students in schools offering internet-assisted instruction in a given country by each ISCED level (1-3).	3000 Public Schools
ED7	Proportion of students enrolled by gender at the tertiary level in ICT-related fields (for ISCED levels 5 and 6)	Number of students currently admitted in ICT-related fields[22] by gender as a percentage of all students enrolled in educational institutions in a given country by gender for ISCED levels 5 and 6 (combined).	Not Available

[22] ICT-related fields include computer science, computer engineering, information and communication technology, information systems, multimedia systems, ICT management, system support and software development, informatics, etc. These are represented by ISCED97 Fields of Study 48-Computing, together with elements of 21-Arts (audio-visual, media production and design) and 52-Engineering (electronics and automation). These fields involve substantial work in understanding the technical aspects of ICT rather than a more generic or basic use of ICT.

Core indicator		Definitions and notes	2018
ED8	Proportion of ICT-qualified teachers in primary and secondary schools	Number of primary and secondary teachers who have received ICT training, expressed as a percentage of the total number of teachers at these levels of education.	90%
EDR1	Proportion of schools with electricity (by ISCED level 1 to 3)[23]	Schools with electricity as a percentage of the total number of schools in the country for each ISCED level (1-3).	100%

Classificatory variables:

The main classificatory variable used for the ICT in education indicators is the 1997 version of ISCED (the International Standard Classification of Education, maintained by UNESCO). ISCED recognizes several levels of education as follows:

- ISCED 1 – Primary education or first stage of basic education;
- ISCED 2 – Lower secondary or second stage of basic education;
- ISCED 3 – Upper secondary education;
- ISCED 4 – Post-secondary non tertiary education (programmes that lie between the upper-secondary and tertiary levels of education);
- ISCED 5 – First stage of tertiary education (not leading directly to an advanced research qualification); and
- ISCED 6 – Second stage of tertiary education (leading to an advanced research qualification).

[23] Since electricity is not specifically an ICT commodity, but an important prerequisite for using many ICTs, it is not included in the core list, but included as a reference indicator. International studies reviewed by UIS revealed that the lack of electricity is such a significant barrier in many developing economies that monitoring trends of its provision is as relevant as monitoring the supply and use of ICT.

Table 4 - Core indicators on ICT in government

Core indicator		Definitions and notes	2015	2016	2017
EG1	Proportion of persons employed in central government organizations routinely using computers	The proportion of persons employed in central government organizations routinely using computers is calculated by dividing the number of persons employed in central government organizations, who routinely use computers, by the total number of persons employed in central government organizations. The result is then multiplied by 100 to be expressed as a percentage. An optional indicator may be calculated separately for male and female persons employed (or other individual characteristics).	NA	51.3%	NA
EG2	Proportion of persons employed in central government organizations routinely using the Internet	The proportion of persons employed in central government organizations routinely using the Internet is calculated by dividing the number of persons employed by central government organizations, who routinely use the Internet, by the number of persons employed by central government organizations. The result is then multiplied by 100 to be expressed as a percentage. An optional indicator may be calculated separately for male and female persons employed (or other individual characteristics).	NA	81.8%	NA
EG3	Proportion of central government organizations with a Local Area Network (LAN)	The proportion of central government organizations with a Local Area Network (LAN) is calculated by dividing the number of central government organizations with a LAN by the number of central government organizations. The result is then multiplied by 100 to be expressed as a percentage.	NA	5.1%	NA
EG4	Proportion of central government organizations with an intranet	The proportion of central government organizations with an intranet is calculated by dividing the number of central government organizations with an intranet by the number of central government organizations. The result is then multiplied by 100 to be expressed as a percentage.	NA	100%	NA
EG5	Proportion of central government organizations with Internet access, by type of access	The proportion of government organizations with Internet access, by type of access is calculated by dividing the total number of central government organizations with Internet access (by each type of access and ‘any’ access) by the total number of central government organizations. The result is then multiplied by 100 to be expressed as a percentage.	NA	NA	NA

Core indicator		Definitions and notes	2015	2016	2017
		Note that the sum of percentages of each type of access is likely to exceed 100, as many central government organizations will have more than one type of access service.			
EG6	Proportion of central government organizations with a web presence	The proportion of central government organizations with a web presence is calculated by dividing the number of central government organizations with a web presence by the number of central government organizations. The result is then multiplied by 100 to be expressed as a percentage.	NA	100%	100%
EG7	Selected Internet-based services available to citizens, by level of sophistication of service	Unlike indicators EG1 to EG6, this indicator refers to both central and state/provincial levels of government. This is necessary to ensure international comparability as the services selected may be offered by different levels of government across countries. Because the approach taken to measuring Internet-based services is relatively untested5 and because responses may be somewhat subjective, the indicator is initially considered to be 'experimental'. The indicator is weighted by population in order to show the significance of government Internet-based services at the national level. The indicator is expressed in terms of the percentage of a country's population that is theoretically able to access each Internet-based service. Note that this does not refer to whether a citizen has the equipment or knowledge necessary to access those services, whether s/he needs to access those services or whether s/he directly benefits (for example, most of the services are not relevant to children). The ability to access each service will usually be linked to the relevant jurisdiction, for example, a citizen residing in a particular state will theoretically be able to access Internet-based services offered by that state government, though may not need to, wish to, or be technically capable of doing so.	NA	NA	NA