سلطنة عمان
هيئة تقنية المعلومات
Sultanate of Oman
Information Technology Authority

عمان الرقمية

Oman Digital Development Review Report 2019

Towards Empowering People and Ensuring Inclusiveness

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His Majesty Sultan Qaboos Directions

We have always emphasized the importance of learning and knowledge and we have always been open to the adoption of new developments in this field. Information technology and communications have now become the main elements that move forward the development process in this third millennium; therefore, we have accorded our attention to finding a national strategy to develop the skills and abilities of citizens in this domain with the aim of further developing e-government services. We are closely following the important steps that we have made in this regard. We call upon all government institutions to speedily enhance their performance, and to facilitate their services, by applying digital technology in order to usher the Sultanate into the constantly evolving spheres for applying knowledge.

His Majesty Sultan Qaboos bin Said

The Annual Session of the Council of Oman

November 2008

Introduction

The Information Technology Authority/Oman (ITA) was established after the issuance of the Royal Decree No. 52/2006 on 31st May 2006. ITA is a public, autonomous organization responsible for the implementation of the Digital Oman Strategy. It is also responsible for the execution and supervision of all national eGovernment projects to create the digital society and economy and that include national infrastructure systems and human resource capacity within the community.

ITA works with a vision to transform Sultanate of Oman into a sustainable knowledge society by leveraging information and communication technologies to enhance government services, enrich businesses and empower individuals. ITA demonstrate ongoing efforts to implement the eGovernment transformation plan approved by the Cabinet in June 2012 to transform the government traditional services into e-services to the public.

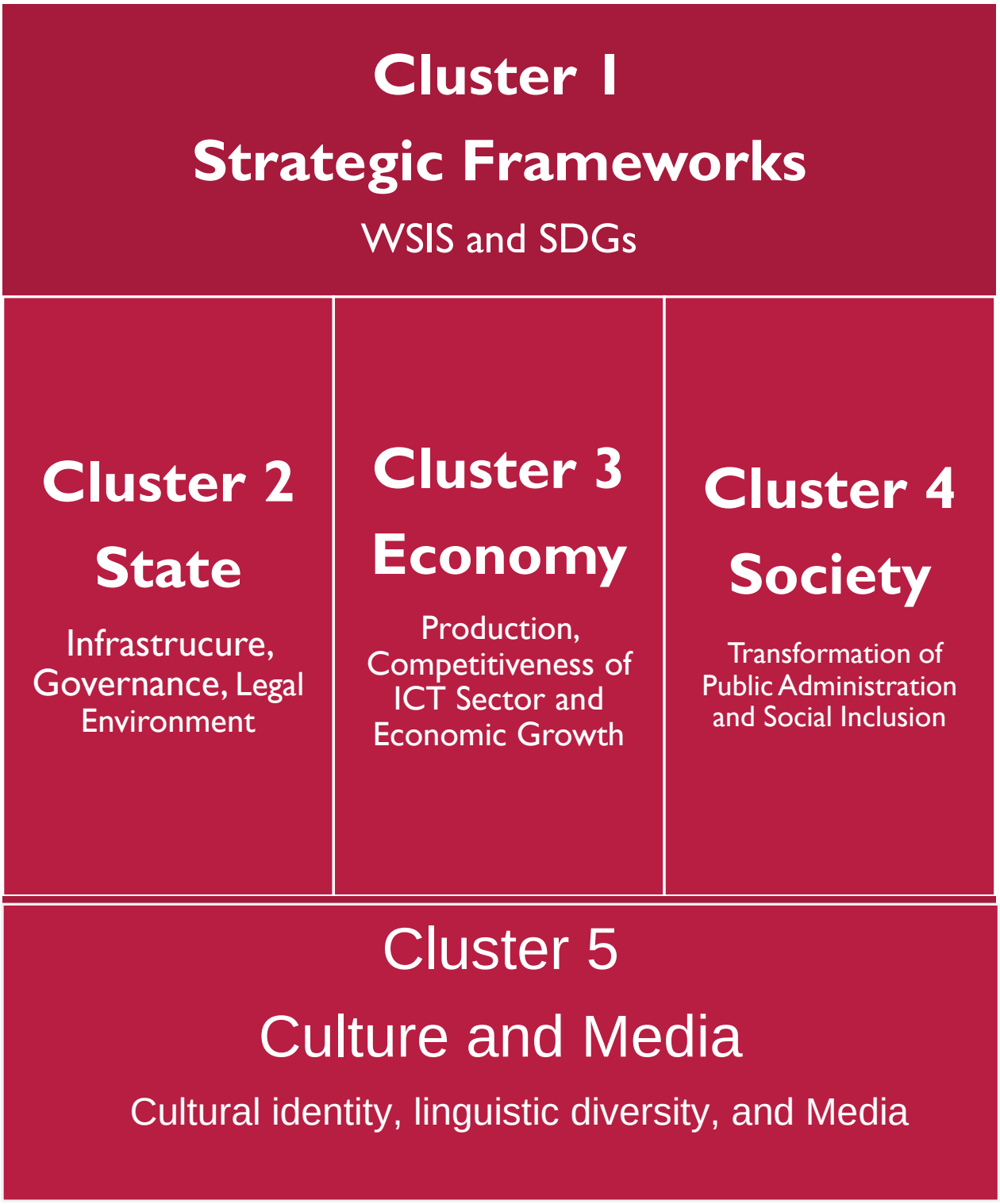
Through its journey to develop the national IT infrastructure, ITA has implemented key national projects in collaboration with other government entities. Examples of these projects are Oman Government Cloud, Oman eGovernance Framework, eTendering, Oman Government Network, The National Data Centre, the National Digital Certification Center and the official Oman eGovernment services portal (Omanuna).

The government of Oman, NGO's and ITA work with a vision to increase digital literacy and IT skills sets to transform Oman into knowledge and IT competence society. This is through adopting several projects and training programs including IT literacy training for government employees, community training, women community training, specialized IT training, and initiatives to improve digital accessibility for the people with special needs. There has been also a number of initiatives to support entrepreneurs and startups to build up an ecosystem that contributes to the development of the ICT sector and subsequently to the economy of the country.

ABBREVIATIONS

ITA	Information Technology Authority
OCERT	Oman Computer Emergency Readiness Team
CKC	Community Knowledge Center
KOM	Knowledge Oasis-Muscat
ISD	Information Security Division
G&C	Governance & Compliance
NDCC	National Digital Certification Centre
PKI	Public Infrastructure
ADSL	Asymmetric Digital Subscriber Line (ADSL)
COI	Communities of Interest
DGCS	Directorate General of Civil Status
GTO	General Telecommunications Organization
HEIs	Higher Education Institutions
ICANN	International Corporation for Assigned Names and Numbers
ICDL	International Computer Driving License
MDG	Millennium Development Goals
IFS	Integrated Finance System
HEAC	Higher Education Admissions Centre
NCSI	National Center of Statistics & Information
MOCI	Ministry of Commerce and Industry
MoE	Ministry of Education
MoF	Ministry of Finance
MoH	Ministry of Health
MoHE	Ministry of Higher Education
MoNE	Ministry of National Economy
MSP	Multi-Sector Partnership
NRS	National Registration System
OEPPA	Oman Establishment for Press, Publication and Advertising
OMANTEL	Oman Telecommunication Company
OMR	Omani Riyal

OMNIC	Oman Network Information Centre
ONA	Oman News Agency
OSO	Oman Statistics Online
OSS	One Stop Shop
OWAN	Oman Women's Association
PDO	Petroleum Development Oman
PEIE	Public Establishment for Industrial Estate
PPP	Public-Private Partnership
R&D	Research and Development
ROP	Royal Oman Police
SOC	Security Operation Centre
SQU	Sultan Qaboos University
SRC	Scientific Research Council


Cluster 1
Strategic Frameworks
WSIS and SDGs
Cluster 2
State
Infrastrucure, Governance, Legal Environment
Cluster 3
Economy
Production, Competitiveness of ICT Sector and Economic Growth
Cluster 4
Society
Transformation of Public Administration and Social Inclusion
Cluster 5
Culture and Media
Cultural identity, linguistic diversity, and Media

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

The Sultanate has always emphasized the importance of learning and knowledge and have always been open to the adoption of new developments. The field of information technology and communication has now become the main element that drives the development process forward in this Third Millennium. Therefore, Oman has accorded its attention to finding a national strategy to develop the skills and abilities of citizens in this domain with the aim of further developing e-government services. Striving to achieve the vision of HM by expanding the focus from outputs to outcomes and from projects to services. The dissemination of best practices adopted by Oman government agencies now been undertaken at regional and global levels.

The adoption of the e.Oman Strategy in March 2003 was one of the steps towards achieving the vision of His Majesty Sultan Qaboos bin Said, may God protect him, to transform the Sultanate of Oman into a knowledge-based economy. The strategy describes the key aspects of developing the Sultanate of Oman into a digital society and the implementation of eGovernment.

Ministry of Transport & Communication in coordination with Information Technology Authority (ITA) and Telecom Regulatory Authority (TRA) have played a vital role in developing sector specific strategies and policies to mobilize stakeholders from public and private sectors and supporting favorable ecosystem for information society development.

A. National digital strategies

The details of strategies and policies formulated to achieve information society development goals are as follows:

Overarching National Digital Strategy exists (like Digital Nation, Smart Nation, Digital Economy…etc.)	*Yes*
Name of the Strategy	*e.Oman Strategy*[1]
Year of adoption and latest update	*adoption: 2003, latest update: 2016*
Government agency in charge	*Name in English: Information Technology Authority* *Name in Arabic: هيئة تقنية المعلومات*
Pace of implementation	*Excellent*
Description of progress made	Specialized training programs to provide IT literacy to enhance the skills of Omani IT professional where around 6500

[1] https://www.ita.gov.om/ITAPortal/eOman/eoman.aspx

	specialized training opportunities and 123 job attachment were offered. 19 government entities were connected in the High-Speed Oman Government Network and more than 300 online services were launched. Issued a set of policies, frameworks, standards and guidelines covering various fields. ITA has launched Government cloud and National Data Center, hosting 23 Government entities in the cloud and 35 entries in the National Data Center. ITA regularly arranges a number of activities, projects and services locally and abroad through launching marketing and media awareness campaigns, which aim to enhance the awareness of the e.Oman Strategy through all various mass media means.
Sectoral (ICT)	*Yes*
Name of the strategy / plan	*Oman National Strategy Framework for ICT Sector*[2]
Year of adoption and latest update	*2019*
Government agency in charge	*Name in Arabic: وزارة النقل والاتصالات* *Name in English: Ministry of Transport & Communication*
Pace of implementation	The Development of ICT Strategy is in progress
Description of progress made	Oman national ICT strategy framework will address the ambition, objectives, strategy and high-level implementation. The ICT vision will cover ICT Sector in Oman, and overall, economic contribution, society empowerment, and sectoral enablement. One of the main objectives for the ICT sector is to contribute to the national economy and increase the GDP, focusing on the 4th industrial revolution technologies in alignment with the country national 2040 vision.
Other Sectors	*Yes*
Name of the strategy /Plan	*eGovernment Transformation Plan*[3]

[2] https://andp.unescwa.org/sites/default/files/2020-10/Oman%20National%20Strategy%20Framework%20for%20ICT%20Sector.pdf

[3] http://www.oman.om/wps/portal/index/etransformationplan

Year of adoption and latest update	*2012*
Government agency in charge	*Name in English: Information Technology Authority* *Name in Arabic: هيئة تقنية المعلومات*
Pace of implementation	*Excellent*
Description of progress made	The eGovernment Transformation Plan is a national project adopted in 2012 by ITA. It aims at accomplishing the full e-transformation in the government services and transactions to assure a sustainable knowledgeable society and economy. It also seeks to enhance the quality of the government services and the method of delivery as per certain regulations, standards and time-bound stages in order to simplify the services for the citizens, business and government entities. As part of ITA's ongoing efforts to implement the eGovernment transformation plan, 300 eGovernment services were launched since then.
Name of the strategy /Plan	*National Broadband Strategy*[4]
Year of adoption and latest update	*2013*
Government agency in charge	*Name in English: Ministry of Transport & Communication* *Name in Arabic: وزارة النقل و الاتصالات*
Pace of implementation	*Excellent*
Description of progress made	The Oman Broadband Company is the Government arm mandated with building and developing the necessary broadband infrastructure in the Sultanate as stipulated in the third pillar of the National Broadband Strategy. At the end of 2018, the company has succeeded in connecting more than 72,038 homes and 2,190 commercial units with the broadband network in Muscat Governorate, as well as implementing several independent projects to connect many government and private institutions. The company also seeks to find practical solutions to complement the efforts exerted to provide high-speed internet service to all regions of the Sultanate with high quality that complies with international standards by using intelligent technologies that help in delivering the service to homes efficiently. In addition, the company signed several MoUs to bridge the digital divide in rural and remote areas and achieve high-speed broadband service in these areas.

[4] https://www.omanbroadband.om/National-Strategy.html

Name of the strategy /Plan	*National eCommerce Strategy*[5]
Year of adoption and latest update	*2019*
Government agency in charge	*Name in English: Ministry of Transport & Communication* *Name in Arabic: وزارة النقل و الاتصالات*
Pace of implementation	*The development of the strategy is in progress*
Description of progress made	A National eCommerce Strategy is to be developed by the Ministry of Transport & Communication in 2019. It has been drafted with the assistance of UNCTAD. A final draft of the strategy, overseen by a high-level national committee, has now been submitted to the Council of Ministers for consideration and approval. The purpose of the strategy is to keep abreast with the current developments and establish an integrative logistic, commercial, banking and technical system for e-commerce and work to implement them in coordination with the competent authorities. It also aims to keep abreast with the efforts towards the development of infrastructure and the main components for that.

B. National Engagement in International and Regional Cooperation Initiatives

1. WSIS Follow-up

The Sultanate of Oman has actively participated in the WSIS process since its inception, in WSIS Summits in 2003 in Geneva and 2005 in Tunis. In the second phase, Oman was one of the financial contributing countries to the Summit and participated in the exhibition along with other countries. Since then, the Sultanate is committed to work towards achieving the WSIS goals and to drive the information society initiatives in all walks of life; bridging the digital divide through capacity building in order to develop Oman knowledge society. The below table shows list of projects within Oman government entities that won the WSIS prize between 2012-2018 and were implemented to achieve nationally and regionally development goals including SDGs:

[5] https://oman.om/wps/wcm/connect/16a60266-7924-4790-be55-83681e429323/eCommerce+Strategy+Original.pdf?MOD=AJPERES&CACHEID=16a60266-7924-4790-be55-83681e429323

Organization	Project	Category	Rank
WSIS 2018			
MOE	Parents Mobile App	Category C3: Access to Information and Knowledge.	1
WSIS 2017			
MOH	MOH: Portal + mobile app eSehaty	C7. ICT Applications E-Health	Champion
MOMP	MOMP: Advanced Manpower Management Systems	C7. ICT Applications E-Employment	Champion
WSIS 2016			
MOCI	Invest Easy	C7. ICT Applications E-Business	Champion
ITA	PKI	C5. Building confidence and security in the use of ICTs	Champion
WSIS 2015			
MOMP	e-Employment Collaboration	C7. ICT Applications E-Employment	1
WSIS 2014			
ITA	CERT	C5. Building confidence and security in the use of ICTs	1
WSIS 2013			
MOH	Reducing Child Mortality	C7. ICT Applications E-Health	1
WSIS 2012			
MOCI	One Stop Shop	C7. ICT Applications E-Business	1

ITA regularly conducts ICT access and use surveys in various sectors including household and individual, government, education (general education & higher education), and business.

1. **ICT Households & Individuals Survey:**
   The Survey on ICT access and usage in households and individuals has been conducted two times. The first survey was conducted as stand-alone in 2013 with a sample size of 11,229 collective households. The survey was designed based on international guidelines by following "The Core ICT Indicators" developed by the Partnership on Measuring ICT for Development – International Telecommunication Union (ITU). The survey data collection was implemented by face-face interviews targeting all households' members 5 years and above in the selected households. The questionnaire aimed at collecting data on Internet, PC, Internet activities, use of social media, awareness and interaction with eGovernment services provide through the national portal.

2. **ICT Access and Use in Education Sector**
   Education ICT access and use survey was conducted by the Ministry of Education (MoE) in collaboration with ITA in 2010 as the firs ICT measuring practice in the educated sector. The survey covered all schools in the Sultanate targeting faculty members and students. Currently, the ICT access and use indicators in the education sector is collected through the online form located in the Educational Portal (http://home.moe.gov.om/arabic/index.php) where data feeding is performed on regular basis by school administrations.

3. **ICT Access and Use in Business Sector:**
   ITA conducted ICT Access and Use in Business survey twice in cooperation with the Ministry of National Economy (currently National Center for Statistics and Information). The first survey was implemented in 2009 taking a sample size of 2,300 businesses representing business sector in the Sultanate. The questionnaire design is based on the Core ICT Indicators on the Use of ICT by Businesses published by UN-Partnership on Measuring ICT for Development.

4. **Telecom Market Indicators Report** published by TRA on quarterly basis to provide brief market intelligence on Telecom Sector to all interested parties including investors, consumers, and licensees. It provides a brief update on the status of major telecom services in the Sultanate of Oman. The quarterly reports cover voice & data services for both fixed and mobile segments, in addition to Internet services & Broadband.

5. **eGovernment Readiness Reports**
   ITA works annually on assessing the progress and performance of government entities with respect to various areas and factors that contribute to accomplishing the transformation of eGovernment. To ensure that government agencies meet the national targets, ITA has established an eGovernment Transformation Assessment System and a measurement process to know the progress that the entity has fulfilled in accordance to the transformation plan.

Moreover, **Oman Open Data Portal**[6] provides over 355 datasets from 30 entities, for everyone citizen, investor, researcher or developer. The Oman Open Data portal is a free and open data-sharing portal where anyone can access data relating to the Sultanate of Oman.

[6] http://oman.om/wps/portal/index/opendata/?lang=en

Manafeth Oman Trade Statistical Gateway[7]

The Oman Statistical Portal for International Trade (Manafeth) provides detailed statistical data about the external trade of the Sultanate in terms of imports, exports, and re-exports, as well as data about goods and customs outlets in addition to trading data with other countries.

2. Other related frameworks

United Nations Public Administration Network (UNPAN)[8]

UNPAN's mission is to promote knowledge sharing, experience and best practices throughout the world by means of ICTs, sound public policies, effective public administration and efficient civil services, and through capacity-building and cooperation among Member States. UNPAN is designed to help countries, especially developing countries and countries in economic transition, to respond to the challenges that governments face in bridging the digital divide between the 'haves and have-nots' and to achieve their development goals.

Around the world, countries update the news through UNPAN Network, and in Oman, ITA is the organization responsible to participate and upload any news related to ICT either announcements, news, documents, events and different resources.

Oman CERT Cooperation with IMPACT

Oman's National Computer Emergency Readiness Team (OCERT) has been chosen as the regional center for cyber security for 21 countries across the Arab region in a move that will boost Oman's position in the eSecurity sector. Recognizing the role played by ITA, represented by OCERT, a Memorandum of Understanding (MoU) was signed between OCERT and IMPACT (The International Multilateral Partnership against Cyber Threat), which is the cyber security arm of the United Nations' specialized agency International Telecommunication Union (ITU). The MoU was signed in cooperation with ITU. The key objectives of the center is to assist in developing cyber security initiatives and encourage research throughout the region.

Collaboration with ITU (International Telecommunication Union)

The United Nations specialized agency for information and communication technologies (ICTs), is recognized around the globe as the leading provider of timely and comprehensive telecommunication/ICT statistics and trends. The ICT-Eye website is a one stop-shop for telecommunication/ICT indicators and statistics, regulatory and policy information, national tariff policies and costing practices, and much more. ITU ICT EYE has recently published “Country Profile 2018”. Each of the following indicators has been estimated as shown below:

[7] https://manafeth.ncsi.gov.om/

[8] http://www.unpan.org/Home/UNPANCMS/tabid/784/language/en-US/Default.aspx

Indicators	2018	2017
Households with a computer	93.4%*	87.5%*
Households with Internet access at home	88.6%*	86.1%
Individuals using the Internet	80.2%*	76.8%

**** ITU Estimates***

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

A. ICT Infrastructure

Infrastructure is central in achieving the goal of digital inclusion, enabling universal, sustainable and affordable access to ICTs by all. It considers relevant services already in place in developing countries and in countries with economies in transition, to provide sustainable connectivity and access to remote and marginalized areas at national and regional levels.

1. Market structure and regulatory landscape

The ICT infrastructure in Sultanate of Oman is keeping pace with all aspects of technological developments. With unprecedented saturation of smart phones and mobile devices, 99% of the population have access to reliable telecommunication services. The Telecom Regulatory Authority (TRA) in cooperation with local telecom operators have already tested the fifth generation (5G) services and constituted a national level team to pave the way for the roll-out of 'Next Gen Wireless'.
Oman telecommunication market has four active operators in mobile services, which are providing mobile, voice and internet services:

- Two Mobile Network Operators MNOs: Omantel & Ooredoo
- Two Mobile Virtual Network Operators MVNOs (Mobile Resellers): Freindi Mobile & Renna Mobile

By Q3 2018, the market share of Omantel and Ooredoo was 45% & 43% respectively, whereas the mobile resellers had 12% of the market share.

In terms of internet services, the market currently has three main operators providing internet services:

- Omantel provides internet as well as fixed telephone services.

- Ooredoo also provides internet and fixed wireless telephone services.
- Awasr is providing Fixed Broadband Internet service (FTTH) only.

In order to enhance the availability of high-speed fixed broadband services, the government has established Oman Broadband Company (OBC) in 2014 to provide passive infrastructure for fixed broadband services.

Under the Telecoms Act (Article 20) it is mandatory for all persons or companies who wish to establish or operate a telecommunications system or provide telecommunications services, to obtain a license from TRA prior to starting operations. The licensing framework divides the licenses into three classes: Class I, Class II, and Class III. These different classifications denote the variations on nature of operations and the network setup.

Class I licensees are permitted to establish or operate a public telecommunications network or international telecommunications infrastructure. There are currently six operators of Class I Licences.

Class II licence is issued to those operators providing public telecommunications services, which rely upon a Class I licence network capacity. There are two mobile resellers.

Class III licences are granted to operators of private telecommunications services, not connected to the public network.

	Class I	**Class II**	**Class III (Private Networks)**
Fixed Telephone (voice)	Omantel, Ooredoo		
Fixed Broadband	Omantel, Ooredoo, Awaser		
Mobile Cellular (voice)	Oman mobile, Ooredoo	Renna, Friendi	
Mobile Broadband	Oman mobile, Ooredoo	Renna, Friendi	
International Gateway	Omantel, Ooredoo, Teo, Connect Arabia International		
Others	OBC (Fixed Broadband Infrastructure) Madakhel (Submarine Services)		Rignet Azyan

Telecom Service	**Status of regulatory landscape**	**List all awarded telecom licenses**
Mobile services	Competitive	MNOs (Class I): Omantel & Ooredoo MVNOs (Class II): Friendi & Renna
Internet services	Competitive	Omantel

		Ooredoo Awasr (only FTTH)

3. ICT infrastructure by service type

The above-mentioned services are available in the market and are provided by operators listed above. However, broadband services are not available in some remote areas.

With regards to "Next Gen Wireless" services, TRA in cooperation with local operators have tested the 5G services and constituted a national high-level team to pave the way for the roll-out of fifth generation (5G) in the Sultanate.

There are three active ISPs in the Market:

1. Omantel: almost all technologies (DSL, FTTH, LTE)
2. Ooredoo: fixed wireless broadband and LTE
3. Awasr: FTTH only

Service mobile phone networks and penetration.

1. Omantel (MNO): 2G, 3G and 4G
2. Ooredoo (MNO): 2G, 3G, and 4G
3. Friendi Mobile (MVNO), 2G, 3G and 4G
4. Renna Mobile (MVNO), 2G, 3G and 4G

The population has access to 2G, 3G & 4G almost everywhere in the country except some remote areas, which are not covered by 4G yet. The penetration rate is provided below

Indicator	**Value**	**Latest Year**
Mobile phone penetration	141.25%	-Internet users as of 2017 - Bandwidth as of 2018
Percentage of households with Internet access	88.6%	
International Internet bandwidth (bit/s) per Internet user	93,155 bits per second/user (Calculated as below: Total International Internet Bandwidth usage = 296,926 Mbps Total Internet users* multiplied by population) =	

	92%*4,559,963=4,195,165.960)	
Percentage of the population covered by mobile networks		
- At least 3G	99%	2018
- At least LTE/WiMAX	88%	
Fixed-broadband subscriptions by speed tiers as a % of total fixed-broadband subscriptions		
- 256 Kbit/s to 2 Mbit/s	5,226	2018
- 2 to 10 Mbit/s	327,119	
- 10 Mbit/s or more	88,993	

4. ICT connectivity

Digital inclusion, enabling universal, sustainable, and ubiquitous access to ICTs by all, namely: households; businesses; government institution; schools; universities; health institutions; libraries; post offices; museums; community centres; and other institutions.

As part of TRA's vision to ensure coverage of telecom services, and TRA's Universal Service Obligations, three joint initiatives between TRA and operators have been progressing to provide telecom services in rural areas.

- The establishment and installation of 200 mobile communications stations (100 Omantel, 100 Ooredoo) to cover around 250 rural villages.

- The construction and installation of 112 mobile communications stations (50 covered by Omantel and 62 covered by Ooredoo) to provide the mobile telecom service to 160 rural villages.

- Omantel Obligations:
  Obligations were imposed on Omantel out of the settlement in the outage of the company network for 8 hours in 2014. It was agreed to impose an obligation upon Omantel to provide broadband services to a number of villages in rural areas at a total cost of R.O 2 Million, in the following initiatives:

  Part 1: Mobile Broadband Services (11 Sites)

  Part 2: Fixed Broadband Service (FTTH) (7 sites)

5. *Internet Architecture*

by the end of 2017, there were 351,335 total fixed internet subscriptions showing an increase of 30% against the previous year. Fixed internet subscriptions' penetration rate in terms of households increased by 13% to reach 60.1% by the end of 2017.

Broadband network infrastructure:

The Fixed Broadband subscriptions including DSL, fixed wireless, FTTH, Internet Leased Lines, and others have grown by 30.7% over the previous year. By the end of 2017, Fixed Broadband penetration per household increased to 59.7%, the Active Mobile Broadband subscriptions increased to 4.352 million And Mobile Broadband penetration per inhabitant increased to 95.4%.

WiFi hotspots, WiMAX services and 3G/4G mobile networks:

The introduction of WiMax and WiFi technology in Oman offered every citizen with easy connection to the internet through mobile connectivity. With the pervasiveness of smart mobile devices, mobile connectivity is key to internet connectivity in the Sultanate. Percentage of the population covered by mobile networks at least 3G is 99% and 88% for LTE/WiMAX. Hence, every home, office, school, business has access to the worldwide network. Most importantly, they will be able to obtain information, interact, transact in the Omanuna portal and gain access to knowledge.

Adoption of IPv6:

In the context of the widespread proliferation of Internet-related resources and IP-enabled devices directly connected to the network, the replacement of IPv4 addresses has become critical because of the near-exhaustion of these addresses and the transition to IPv6. TRA, in partnership with ITA, has developed a clear and well-defined plan for seamless transition to IPv6 for the continued growth and stability of the Internet. Technologies such as 4G, Smart Cities and Internet require more and more Internet addresses. This plan applies to all devices, systems, websites, applications and other uses that require the use of an Internet address at an increasing rate more than ever.

Since the advent of IPv6, the Government of Sultanate of Oman has recognized the importance of deploying IPv6 in the country and has taken an important step by forming the Oman IPv6 Task Force (OTFv6) to work with the TRA in the Sultanate. The main goal of OTFv6 is to give the initial push required by the industry to move on the road to IPv6 adoption. It was tasked to bring all the industry stakeholders to a common IPv6 platform countrywide. To increase awareness of IPv6 deployment, the OTFv6 published the IPv6 Guidelines document, the national IPv6 transition plan for transiting from IPv4 to IPv6. The OTFv6 carried out a number of activities under the umbrella of the TRA such as visiting entities from Public and the private sectors, conducting training programs on IPv6, sharing IPv6 best practices to the Government organizations, and releasing IPv6 monthly newsletters. As for IPv6 testing of equipment, and to ensure that all stakeholders perform the IPv6 journey in a coordinated and standardized manner, TRA has started developing an IPv6 test lab that is contributed by the telecom vendors for the benefit of stakeholders for getting their networking equipment tested for IPv6 readiness.

6. Domain name management and adoption

The TRA has accredited the 5th accredited registrar for the country code top-level domain (ccTLD) of (Sultanate of Oman (.om) and the Arabic domain of Sultanate of Oman.عمان). The TRA is adopting a Registry-Registrar Model for registering domain names, through which private companies were accredited to compete and register domain names on behalf of TRA.

The Abu Ghazaleh intellectual property (AGIP) is joining the previously accredited registrars: Omantel, Ooredoo, Gulf CyberTech and Oman Data Park.

Name of ccTLD registrar	*Name in English:* Oman Telecommunications Company -Omantel Omani Qatari Telecommunications company – Ooredoo Gulf Cyber Tech Oman Data Park Abu Ghazaleh intellectual property- AGIP Interactive Solutions & Services *Name in Arabic:* الشركة العمانية للاتصالات عمانتل الشركة العمانية القطرية للاتصالات – أوريدوو مؤسسة الخليج لحلول الشبكة الالكترونية مؤسسة عمان للبيانات الرقمية مؤسسة أبو غزالة للملكية الفكرية شركة التفاعلية للحلول والخدمات
URL of registrar	*(http://www.registry.om/oman/en/?page_id=197)*
Total Number of ccTLDs registered in the country for the years 2015, 2016, and 2017.	*2015: 3331* *2016: 3397* *2017: 3761*

B. Governance

ICT represents a significant investment as well as a significant enabler of the eOman vision, requiring effective governance and planning. Pursuant to Royal Decree 52/2006, ITA is responsible for the implementation of the e.oman Strategy and to provide professional leadership to government agencies.

ITA's Governance and Compliance division acts as a central IT governing body to coordinate IT planning efforts and strategies for the effective use of resources across the government. ITA has exclusive responsibility to make recommendations to the Cabinet of Ministers on all IT-related matters for the whole of government.

Towards involving relevant stakeholders in devising digital strategies for the information society through exchanging best practices, the government of Oman adopted Tanfeedh[9] as an initiative that aims mainly at linking the strategies of the main vital sectors in order to diversify the national income resources and fulfill the objectives of the Ninth Five-Year Development Plan 2016 – 2020. It also works towards a sustainable collaboration between the public and private sectors.

Moreover, the main pillars of Oman vision 2040[10] are to enhance the effectiveness of governance and the rule of law, improve the efficiency of government agencies, increase coordination among them and enhance citizens' confidence by creating an institutional framework that enacts laws and practices and ensures the system transparency and accountability.

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

Smart City Platform (Supreme Council for Planning, ITA, Muscat Municipality, and Research Council)

Smart City Platform was launched in February 2017, aims at providing a platform for knowledge sharing, networking and collaboration between the smart city stakeholders and creating an awareness of the significance of applying smart city solutions in Oman. The platform duty is to facilitate and enable smart city innovations, prototype and test smart solutions as well as creating awareness on the importance of smart city solutions in the Sultanate.

Smart City Pilot in KOM

TA signed an agreement in 2018 for the implementation of a pilot project for transforming Knowledge oasis/Muscat into a Smart City in cooperation with a distinguished group of Omani innovators and SMEs. ITA's Smart City Pilot will cover smart parking, smart lighting, urban mobility, smart environment, smart waste and smart transportation. Through the outputs and outcomes of this project, ITA will set a policy for organizing smart city projects and initiatives in the Sultanate.

The Ministry of Education and Oman Telecommunications Company (Omantel)[11]

The Ministry of Education and Oman Telecommunications Company (Omantel) signed on December 2018 a cooperation and partnership agreement in a series of programmes, under which Omantel will support the education and innovation sector in the various aspects that contribute to enhancing the teaching and educational process in Oman. According to the agreement, Omantel, as part of its social responsibility, will

9 http://www.oman.om/wps/portal/index/interact/tanfeedh/!ut/p/a1/hc9Bb4JAEAXg38LBKzO7IMHjqFUXSghdBbqXBpt1xQLbUFL684uN1-rcXvK95A0oKEF11XdtqqG2XdVcswre0owFbJdiHObZE9ILyYwY54j-BF4ngP8c4aO-1B0UoP6YjOKlFD7HdCMZChK71Yr2nB2CG_Bwi5guRBLvE0Lu5Zto8Rx467V_A3d2RKBMY4_TT8USVJ6YGbZ0nU_d0QsNqF6fdK9792y_BijHcXSNtabR7rtt4bMtf8Rl_lGQ4_wCsLEuww!!/dl5/d5/L0lKQSEvUUt3SS80RUkhL2Vu/

10 https://www.2040.om/en/

11 https://timesofoman.com/article/671939

support the Omantel School Olympiad for the purpose of discovering and encouraging junior and young talents, drawing attention to importance of information technology.

Agreement between Ooredoo and Ministry of Endowment & Religious Affairs for AI & IoT Technologies[12]

Ooredoo signed an agreement with the Ministry of Endowment & Religious Affairs for Artificial Intelligence (AI) Technologies for Big Data and the Internet of Things (IoT) on November 2018. The partnership aims to enhance the efficiency and productivity of the Ministry's daily operations by implementing a three-phased work-plan over the course of six months

2. Participation in Internet Governance activities

ITA Oman has actively participated in the Internet Governance Forum (IGF) since 2006. Recently, Oman has passed the string evaluation process of ICANN which is required to launch the internationalized top-level domain (IDN) in Arabic language. The evaluation process includes several steps such as verification that the selected language is considered official in the country making the request and that the string requested is a meaningful representation of the corresponding country name. ICANN also requests for a documentation of community support for the string and assess whether the string requested raise any significant security and stability issues in the domain name system or raise any confusion issues with any existing top level domain names or other requested top level domain names. TRA in Oman is the leading government agency entrusted to manage and assign domain top-level domain names.

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

1. Legal and regulatory environment

The legal and regulatory framework provides trustworthy, transparent and non-discriminatory environment for the cooperation between public and private sectors. Policies are in place to ensure protection of sensitive digital information and protection of personal data. Details are as follows:

The Omani government has initiated various steps towards **IP protection**, from the implementation of domestic laws to the involvement in conventions and international treaties. The Sultanate of Oman is a member of several international treaties, conventions and protocols including: The Gulf Cooperation Council, The World Trade Organization, The World Intellectual Property Organization, the Berne Convention, the Paris Convention, the Madrid Protocol and the Patent Cooperation Treaty.

In addition to the international treaties and conventions listed above, the Sultanate of Oman has enacted several domestic laws protecting IP rights.

[12] https://www.ooredoo.om/AboutOoredoo/Media/PressReleases/DetailPressRelease/tabid/2375/ArticleId/3734/Ooredoo-Signs-Agreement-with-Ministry of Endowment and Religious Affairs for AI and IoT Technologies.aspx

The applicable laws in Oman:

- The Industrial Property Rights Law ("IPRL"). Remedies available under IPRL are: Invalidation/removal, civil action, and criminal action.
- Law on trademarks
- Law on patents

TELECOM ACT OF THE SULTANATE OF OMAN

The principal legislation governing the telecommunications sector in Oman is the Telecommunications Regulatory Act which was issued in March 2002 under Royal Decree No. 30/2002. The Act was amended twice in 2008. To view the latest version of the Act, please visit TRA's website at www.tra.gov.om

International Treaties and Conventions on Intellectual Property	Adopted (Y/N) or Observer	Year of Adoption
WTO	Yes	2000
Paris Convention	Yes	1999
PCT	Yes	2001
WCT	Yes	2005
Madrid Agreement	Yes	2007
Hague Agreement	Yes	2008
PLT	Yes	2007
TRIPS	Yes	2017

Cyber Laws	Law number	Year Passed
eTransactions law	*69\2008*	*2008*
eSignature law	*69\2008*	*2008*
ePayment	*69\2008*	*2008*
eCommerce	*69\2008*	*2008*
Management of PKI	*https://omanportal.gov.om/tam/*	

2. Privacy and Data Protection

In the progress, there has been public consultations in 2017 on a draft privacy law. The draft has been revised to be aligned with the GDPR and has been finally submitted to Ministry of Legal Affairs for Issuance and publication.

- Privacy Law (In the drafting stage)
- E-Transaction Law No 69\2008[13]
- Data Classification Law No.118/2011 and its amendment 45/2015, which was issued to insure information and data security and privacy.

Some of the guidelines and policies were issued as below:

- General Security Policy
- Internet and Email Policy
- Web and eServices Hosting Policy
- Oman eGovernance Framework (OeGAF) includes security compliance requirements

3. Countering misuse and preventing abuse of ICTs

The Cyber Crime Law[14] of the Sultanate of Oman has been issued by His Majesty's Royal Decree No 12/2011. The formulation of this law began a new era for Oman, where a truly e-enabled society evolves in the realisation of the digital society of Sultanate. It is a major milestone in the implementation of the e.Oman strategy by ITA of Oman.

ITA provides a secure environment for users of electronic devices by offering high quality security services and raising their awareness about information security. Two main divisions expend the ITA efforts in this field: Information Security Division (ISD), which is responsible for the government entities security, and Oman CERT, which is responsible for the security of the cyberspace in Oman and public awareness in this field.

The key services offered by ISD at ITA include networks and portals protection, internet access security, end-point security, information security operations, security assessment and IT security consultancies[15].

With regard to the efforts to fight Spam at national and international levels**:**

- Public Consultation on Draft Resolution for Anti-SPAM Regulation has been issued.
- Email and internet security policies have been issued and circulated to all government organizations.
- Oman National CERT in cooperation with different government entities conducted awareness sessions on SPAM.
- Some technical measures have been implemented by the TRA.

[13] http://www.ita.gov.om/ITAPortal/MediaCenter/Document_detail.aspx?NID=56

[14] https://www.ita.gov.om/ITAPortal/MediaCenter/Document_detail.aspx?NID=54

[15] https://www.ita.gov.om/ITAPortal/MediaCenter/Document_detail.aspx?NID=117

4. Use of electronic transactions and documents

Digital certification is a service offered by the ITA's National Digital Certification Center (NDCC) that manages the issuance of the digital certification according to the electronic transactions law. The main services of the NDCC are digital identity, digital certification, digital stamp and time stamp that allow citizens and residents to conduct transactions in a high level of confidentiality, trust, credibility and data protection. Activation of TAM is very easy with the PKI enabled ID cards and SIM card and can be used online as a certification method without the need of having to be physically present at the service providers' locations.

In 2017, the NDCC recorded 4.3 million online government transactions using digital certification in the ID card and 1.2 million online government transactions using Mobile PKI.

5. Online and Network Security

Oman's Cyber Security Strategy includes road map including the below domains:

- Organisational Structure
- legal Measures
- Capacity Building
- Technical and Procedural Measures
- Regional and International Cooperation

OCERT

Oman National Computer Emergency Readiness Team (OCERT), المركز الوطني للسلامة المعلوماتية, was established in 2010. OCERT is the national e.Oman Initiative aiming at addressing cyber security risks, building local cyber security capabilities within the sultanate of Oman, building cybersecurity awareness amongst public and private sector organizations, critical national infrastructure and key industries as well as within the general public and ICT users.

The OCERT objectives are:

- Serving as a trusted focal point of contact for any ICT security incidents.
- Building cybersecurity awareness in the Omani internet space.
- Building Omani cybersecurity capabilities to handle security incidents.
- Providing accurate and timely information on current and emerging security threats and vulnerabilities.
- Analyzing the possible security threats and impact.
- Providing proactive measures to minimize security incidents.
- Responding to security incidents and minimize their impact.
- Building trust in using government e-services.

- Promoting R&D in information security.
- Coordinating with regional and international CERTs.

The following demonstrates examples of OCERT 2018 technical achievements:

- Discovered and handled 380,816 real cybersecurity attempted attacks and 66,527 web attacks.
- Detected 194 malware infections through OCERT Intelligence Gathering System from the analysis of Millions of attempted attacks against Oman Cyberspace.
- Successfully and comprehensively handled 2,334 real cybersecurity Incidents reported by government, CNIs and Public.
- Published 341 Security Threat Notification and Alerts "TNAS" on cybersecurity threats to OCERT constituents.
- Handled 140 digital forensics cases with 828 evidence devices including computers, mobile, phones, external hard disk and USBs resulted from cybercrime cases in Oman.

Since its inception, OCERT considered regional and international cooperation one of its main priorities, and below are the achievement highlights in this regard:

- Obtained the membership for the Forum of Incident Response and Security Teams FIRST.
- Assisted in the establishment of the standing committee under the General Secretariat of the Gulf Cooperation Council.
- Elected 3 times as the chair of the board and steering committee of OIC-CERT (Organization of Islamic Cooperation CERT).
- Won the WSIS Prize, in the category of building confidence and security in the use of ICTs in 2014.
- Obtained More than 8 memberships in technical and international cybersecurity institutes.
- Selected by ITU to manage and operate the 1st ITU regional cyber security center for the Arab region in 2013 Due to the leading role played by OCERT in cybersecurity.

Moreover, the ISD at ITA issues a framework "Government Network Security Architecture Framework (GNSAF)" which is followed by all government entities. All measures to secure network and data are included in the framework.

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

A. Building the ICT Sector (C12)

To support economic diversification, The Sultanate is committed to build a robust ICT Sector. Public-private cooperation in different sectors including, but not limited to, telecom operators, software

development firms, technical training institutes, and digital content development and Arabization, are promoted to achieve sustainable results in this regard.

The majority of ICT investments in Oman is from government funding, as the industry is still in the formative stage. Most of the ICT industry players are hardware and software vendors, which are essential in the establishment of the ICT infrastructure for the delivery of e.Oman initiatives. ITA finances key applications development such as the Official eGovernment Portal. The government also develops the major telecommunication infrastructure.

1. ICT firms

One of the main telecommunications companies in Oman is Omantel. Omantel has been offering its private subscribers, the official institutions of the Sultanate since the dawn of the blessed Renaissance in 1970, a diverse range of integrated communications solutions. It is one of the tributaries of the national economy and has played a key role in the national development process. Omantel provides number of telecommunication services as follows:

1. Fixed line service
2. Mobile service
3. Broadband service
4. Web hosting
5. Cloud server
6. Domain registration
7. SSL certificates and more.

Omantel employees are 3200, outsourced staff are 600 where women represent 25% of the total number of company's work force. ITA has selected Omantel as strategic partner to provide Multiprotocol Label Switching (MPLS) services to the government entities through signing Oman Government Network (OGN) agreement contract. Since 2006, ITA has been renewing this partnership due to the high quality and service delivery from Omantel.

In August 2017, Omantel signed an MOU with the Ministry of Environment and Climate Affairs (MECA) ICT solutions. Under the agreement, Omantel collaborates with MECA to find solutions to modernise ICT technologies currently in-use or required by the ministry and develop a shared framework to enable faster delivery of MECA's comprehensive e-services to the sultanate.

The below table indicates the number of the local firms registered under designing and programming software/maintenance of software & designing of websites:

STATUS	Number of companies
ACTIVE	1785

IN_CANCELLATION	7
IN_LIQUIDATION	18
SUSPENDED	52
UNDER_INCORPORATION	1
TOTAL	**1863**

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

In regard to 'Sustainable Development Goal 8 - Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all', the ICT sector in Oman is still relatively new and developing. The growth is spearheaded with the implementation of e.Oman and transformation programs and projects. Among the main initiatives in this context are SAS for Entrepreneurship and SAS for Virtual Reality, aiming to provide the foundation for creating a new and vibrant ICT industry, thereby fostering an entrepreneurial spirit in the ICT sector in Oman. SAS for Entrepreneurship[16] is based on a Public-Private Partnership model aspiring to foster ICT enabled SMEs. The programme contributes to the development of an internationally competitive ICT industry, self-employment and new job opportunities creation, as well as the introduction of new technologies to create innovative products, solutions and services. SAS for Virtual Reality[17], which is also done through PPP model leverages the potentials of immersive technologies to boost innovations and competencies in the digital media sector in the Sultanate. With support from government agencies and private sector organisations, young start-ups are given the opportunity to take their ideas and ventures to become technopreneurs. Some of the government initiatives in this regard are:

- TRC Upgrade Program[18].
- TRC Smart City Platform[19].

16 https://www.oman.om/wps/portal/index/bz/ManagingBusiness/SASEP/!ut/p/a1/hc9Nb4JAEAbgX8OVmd1FXHpbQ_zAUmwwgHtp0KwrCbAGaPHnSxsumpbO7Z08bzIDEjKQdf5V6LwrTJ2X31m6H9E7cck6wi3nbwQFoQsnZAl1FrMBHAaAf4zA__qxqiEFOckCMgKGK8TI24ROnBCkwdKf8XhOV5w9g-0-FEhZsgy8V5f5vjOCiUMDkLo0x5-nD6I-Mq5BNuqsGtXYn82wvnTdtX2x0MK-721tjC6VfTKVhb9VLqbtIHuUcK2y26bYVSlvxR0FWcgL/dl5/d5/L0lDU0lKSWdrbUEhIS9JRFJBQUlpQ2dBek15cXchLzRKQ2hEb01kdEJnY2huQVZHRUEhL1o3X09RMTYxSE8wSzg4TjEwQTEyQjRNM1YyNFIxLzA!/?WCM_PORTLET=PC_Z7_OQ161HO0K88N10A12B4M3V24R1000000_WCM&WCM_GLOBAL_CONTEXT=/wps/wcm/connect/EN/site/home/bz/bz2mb/bz26/

17 https://www.oman.om/wps/portal/index/bz/ManagingBusiness/SASEP/!ut/p/a1/hc9Nb4JAEAbgX8OVmd1FXHpbQ_zAUmwwgHtp0KwrCbAGaPHnSxsumpbO7Z08bzIDEjKQdf5V6LwrTJ2X31m6H9E7cck6wi3nbwQFoQsnZAl1FrMBHAaAf4zA__qxqiEFOckCMgKGK8TI24ROnBCkwdKf8XhOV5w9g-0-FEhZsgy8V5f5vjOCiUMDkLo0x5-nD6I-Mq5BNuqsGtXYn82wvnTdtX2x0MK-721tjC6VfTKVhb9VLqbtIHuUcK2y26bYVSlvxR0FWcgL/dl5/d5/L0lDU0lKSWdrbUEhIS9JRFJBQUlpQ2dBek15cXchLzRKQ2hEb01kdEJnY2huQVZHRUEhL1o3X09RMTYxSE8wSzg4TjEwQTEyQjRNM1YyNFIxLzA!/?WCM_PORTLET=PC_Z7_OQ161HO0K88N10A12B4M3V24R1000000_WCM&WCM_GLOBAL_CONTEXT=/wps/wcm/connect/EN/site/home/bz/bz2mb/bz27/

18 https://www.trc.gov.om/trcweb/topics/media/news/6482

19 https://omanuna.oman.om/en/home-top-level/eparticipation/smart-city-platform

- TRC Research Equipment Database[20].
- SQU Pure House of Expertise portal[21].

ITA has supported government entities to implement innovative tools and techniques as part of their online service delivery. Some of the key initiatives that have had a national impact include Invest Easy Portal, The National Donor and Donation Registry (NBDR) system, the eHajj system, Standardization of Municipalities (ITA Initiative), Oman Research and Education Network (OMREN)[22].

Oman Government has also embarked on an emerging technologies journey to help government to provide its services efficiently and effectively. The proven results show how they have created greater public value and transformed people's lives. ITA has undertaken various initiatives to gain and spread awareness on emerging technology trends and adoption where such technologies (e.g. Artificial Intelligence, Blockchain, and Data Analytics) are now helping citizens' access to government services and information in ways that are more pro-active, agile, innovative through the adoption of. Currently, Proof of Concept projects are being implemented in various sectors for adopting selected emerging technologies.

ITA has conducted a national campaign to aware 101 government and private entities about e-Accessibility and the international standards required to be adopted in 10 sectors including (transportation, telecommunication, e-government, education, health, interior services, social development, manpower, banking). Detailed guidelines and policies have been issued by ITA to ensure that all government online services are fully compliant with the Web Content Accessibility Guidelines (WCAG). Moreover, these guidelines are included as mandatory requirements as part of all ICT projects' scope documents. ITA has a national program to provide text-to-speech software to all government entities at discounted prices to support accessibility initiatives.

3. Government facilitation, Investments and Financing the ICT sector

Sultanate of Oman's government is financing and facilitating the transformation program to enable government entities to provide their e-services either on the web or apps to the final consumers in accessible and simplified ways. The government also allows for PPP model between government entities and private sector based on proper business models and anti-monopoly principles. Furthermore, Oman has implemented a comprehensive strategy to support and promote SMEs in the ICT Sector. Main initiatives implemented for the growth of SMEs include:

- Al Rafd Fund[23]

[20] https://www.trc.gov.om/trcweb/topics/eservices/46

[21] https://squ.pure.elsevier.com/

[22] https://omren.om/

[23] https://www.alraffd.gov.om/ar/Default.aspx

- The Research Council Funding Program[24]

In Oman, ICT is key for achieving sustainable development in respect to building trust between citizens and the government. As government services became online, bureaucratic red-tapes have been replaced with people-centric electronic services promoting transparency and accountability for creating a level playing field.

The need for Oman to transform into a knowledge-based economy was emphasised by His Majesty whilst addressing the Council of Oman in November 2008, stating that "We have always emphasized the importance of learning and knowledge and we have always been open to the adoption of new developments in this field. Information and communication technology have now become the main elements that move forward the development process in this third millennium; therefore, we have accorded our attention to finding a national strategy to develop the skills and abilities of citizens in this domain with the aim of further developing eGovernment services. We are closely following the important steps that we have made in this regard. We call upon all government institutions to speedily enhance their performance, and to facilitate their services, by applying digital technology in order to usher the Sultanate into the constantly evolving spheres for applying knowledge."

As per WTO Oman as government, under the terms of the agreement, is encouraged to invest in the IT sector allowing foreign investors to register companies that are exempt from the Omani partnership requirement and from the requirement of minimum capital.

Knowledge Oasis Muscat (KOM) is being developed into a vibrant ecosystem that should support the development of technology start-ups in Oman. Multinationals as well as start-ups have been attracted to KOM, not only due to its excellent geographic location, facilities, support services and tranquil and secure setting but also for the benefit of close links with the academia. Located close to the Sultan Qaboos University, KOM is also home to two leading private colleges: The Middle East College and the Waljat College of Applied Sciences. Combined, these two institutions have over 8,000 students doing undergraduate and graduate studies in ICT, Engineering and Management.

Furthermore, the free trade agreement with the US should increase opportunities for global vendors and drive liberalisation in several sectors, as well as strengthening copyright protection.

On another note, to encourage industrial investment in Oman, the government has established special economic zones where investors enjoy tax exemptions, trade facilitation, and competitive advantages on imports and customs duties. In general, there are four such free trade zones in Oman: Al Mazunah, Sohar, Salalah and Duqm, each at different stage of development and all designed for foreign companies to leverage Oman's position as a regional manufacturing and distribution base.

In terms of the government support, Oman established **Ithraa**[25] which is the Public Authority for Investment Promotion and Export Development that was established according to the Royal Decree No.

[24] https://www.trc.gov.om/trcweb/

[25] https://www.oman.om/wps/portal/index/bz/InvestmentInOman/Ithraa/!ut/p/a1/hc9Nb4JAEAbgX8OVmd2luPa2hqCCuBoUcS8NNtuVBFgDtPjzSxsvmn7M7Z08bzIDCnJQTfFRmqIvbVNUX1n5L3JLfLKQGMv1nqBY4G4rZyGNEzKC4wjwlxH4Xz_VDRxA3TPO1yMjd

52/2011 issued in March 27, 2011. Ithraa's main mission is to facilitate investment in Oman and develop exports of products and services of Omani origins to overseas market.

in addition, Sharakah, which is a Closed Joint Stock Company incorporated by a Royal Decree No. (76/98) in 1998, provides customized financial solutions in three different schemes: Equity, Loan and Bill and Discounting Scheme. Sharakah shows the on-going commitment and support of the Sultanate of Oman towards entrepreneurship development. Sharakah aims to contribute towards SME development in Oman by spreading awareness about the importance of entrepreneurship and SMEs, providing financial support and consultation services.

The Zubair Small Enterprises Center (Zubair SEC)[26] is one of the initiatives which emanated from the Zubair Corporation's Social Responsibility strategic vision towards the Omani society. Established in 2013, Zubair SEC is envisioned to be more than an incubator for small businesses. Services extended to Zubair SEC members include clinical solution-based advisory, capacity building, networking platforms, business development, and a yearly programme that selects ten winners who receive a financial grant, as well as intensive advisory services, branding, packaging, product stabilization, as well as business development.

As per the latest company registration data received from Invest Easy, the following investments have been made:

CRs Registered		**Total Capital (OMR)**	
Omani CRs without foreign investment	CRs with foreign investment	Omani CRs without foreign investment	CRs with foreign investment
44,282	2,183	4,867,946,047	705,194,169

Breakdown of Omani and Foreign Investments in the ICT Sector	
No of 100% Omani CRs	43873
Sum of 100% Omani Capital	3,697,214,540
No of 100% Non-Omani CRs	559
SUM of 100% Non-Omani capital	161,063,936
No of Omani/Non-Omani CRs	2013
SUM of Omani/Non-Omani capital	1,630,142,258
Total#	46445

OYILKPe3r8BhnNEOV0mXpoRpFEYPPF0QuecPYJ4lwikLAuj6cpnQeDdwB-HRqBMZU_fTx9Fc2LcgGr1m25167634_rc95fu2UEHh2FwjbWm0u6rrR38qXK2XQ_5vYRLnV-X5aY-8E58AmrNBf8!/dl5/d5/L0lKQSEvUUt3SS80RUkhL2Vu/

[26] https://zubairsec.org/

Breakdown of Omani and Foreign Investments in the ICT Sector	
Total Capital	5,488,420,734

This information based on companies registered on Invest Easy which have ICT activities, and the capital shows the total capital registered to start up the business and it's doesn't have any relation on the trading volume in the capital market.

Join Stock companies	No of CRs	SUM of capital
ACTIVE	33	914,036,050
UNDER_INCORPORATION	3	4,250,000

Regarding the government investment funds, Oman Technology Fund - (OTF) is a government-owned fund launched two years ago with a kitty of US$200mn for investing in upcoming technology firms across the world. Oman Technology Fund specializes in start-ups. It seeks to make investments in emerging technology enterprises in Oman and the wider region. The fund also works to attract regional start-ups to relocate their operations to Oman.

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

To increase the contribution of ICT sector in national economy, Oman 2040 vision comes as an interpretation of Sultan Qaboos' foresight. A technical committee is among other committees formed to prepare the future vision "Oman 2040". Similarly, Tanfeedh is another government initiative that aims mainly at the diversification of the national income resources and works towards a sustainable participation between the public and private sectors. The contribution of ICT sector in the national economy is summarized as follows:

1. Contribution of ICT sector in the National Economy

ICT Revenues

IT Industry	2016	2017	2018
IT Market Value	**187.9**	**190.4**	**195.7**
Hardware Sales	89.7	92.4	93.2
Personal Computer Sales	52.2	53.6	54.3
Software Sales	42.2	42.6	44.1
Services Sales	56.0	55.4	58.4

The contribution of the ICT sector to the GDP

IT Industry	2016	2017	2018
IT market value, % of GDP	**0.6**	**0.6**	**0.6**

Oman's ICT strategy is embodied in the e.Oman strategy providing the blueprint for the growth in ICT usage as well as connectivity. With a high mobile penetration rate of 156.73% and internet penetration rate at all-time high (Fixed Internet at 46.14% and Active Mobile Internet at 72%) coupled with high PC penetration rate of 83% in 2013, e-government services has become prevalent, citizens' and residents' ability to communicate, interact and transact has radically improved in recent times.

In the Sultanate, ICT is transforming every aspect of the government services. ITA of Oman, as the main custodian of the e.Oman strategy, provides the stewardship to proliferate ICT as a constituting tool and enabler of public service delivery.

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

No information available.

3. E-business

The Whole of Government Approach is adopted by the Cabinet of Ministers in accordance to the e-Transformation mandate. It is being reflected and implemented through the Invest Easy initiative by instructing not to build duplicate systems and to deal with Invest Easy as the single source for business e-services. It also ensures that services are delivered as whole of government by process simplification and improved efficiency across government. Participation of several government entities and NGOs into the initiative aims to provide the backbone of business e-services, including the national business register, national business licensing system and single window of annual reports.

Moreover, The National ePayment Gateway (ePG) provides an operational component of the e-governance infrastructure and full e-commerce facilities that allow secure online payments (ePayments).

Online retail in Oman is similarly poised for a breakout year in 2018. While internet spending in the broader Middle East is booming, with e-commerce in GCC countries expected to hit $41.5bn by 2020, web sales and home delivery make up less than 1% of all purchases in Oman. This has been argued to be partly due to the lack of a unified postal address system, however this could soon change. In 2017, the NCSI submitted the National Infrastructure for Geographic Information Project to Muscat Municipality, which detailed a four-stage plan to introduce a unified address system for the 2020 Census. Once in place, this is expected to streamline various logistics issues, speeding up home deliveries and driving rapid growth in online spending and e-commerce.

The e-commerce market in Oman accounts to only 1% of total sales. It is still a nascent market and has ample opportunities to grow in future. On the other hand, global e-commerce market is about to reach US$ 2 trillion by 2020 and have a share of 7.8% of all sales. In developed nations, e-commerce share ranges from 45-80%.

In Oman, more than 20% of the population made at least (1) online purchase in 2014. Despite Oman has one of the highest smart phone usages in Middle East region, only 8% of the population did mobile shopping. Most of the items purchased online in Oman are groceries and music. However, more than 1/4th of the population of Oman still purchases products from foreign websites.

High smartphone penetration has helped e-commerce to grow in Oman and neighbouring GCC countries. Oman and UAE have 2nd highest smartphone penetration in gulf region after Qatar which has 79% penetration.

International eBusiness Models for Trade

It may be noted that the GCC e-commerce market is expected to touch $24 billion by 2020 while worldwide the e-commerce sales are forecast to grow to $4.88 trillion, according to Statista.com and other estimates. According to the annual report of the Implementation Support & Follow-up Unit (ISFU), to keep pace with the growth of e-commerce, Oman has established a National -e-Commerce Platform aimed at modernising infrastructure and IT tools in post offices to automate consignment systems. The government aims to use the e-commerce services to make the most of the growing trade volume in the logistics sector and encourage investment from SMEs.

Oman Post is also working on its last-mile delivery project by partially automating its central sorting centre at Airports Heights both in systems and hardware for the country to meet its international and domestic KPIs.

Also, the e-shipping service "Matjar" facilitates online shopping to help customers collect their goods after purchase from markets in US, India or China.

e-Business Standards

The number of electronic transactions carried out via Oman's National e-Payment Gateway nearly doubled in 2017, underscoring the increasingly important role of this portal in enabling secure payments for e-government services, e-commerce, e-tendering, online donations and a host of other online transactions. According to ITA, which operates the National e-Payment Gateway, around 1.9 million transactions were made via this portal in 2017, up from around 1.1 million in the previous year earlier. Revenues handled by the portal soared to RO 365 million last year, up from RO 207 million a year earlier.

The presence of such a robust and secure e-Payment Gateway enables e-government shared services to be paid for electronically through major local and international credit and debit cards and other electronic payment instruments. The gateway currently accepts all international credit cards, debit cards including Visa, MasterCard, Amex and Diner cards.

Since its establishment, growing numbers of ministries, government bodies, banks, financial institutions and private sector organizations have adopted the e-Payment Gateway as a portal for electronic transactions. In 2017, as many as 34 government entities utilised the gateway, as did 32 private sector firms. In addition, 27 charitable and specialized organizations benefited from the services provided by the portal as per the ITA 2017 Annual Report.

Government has mandated that all e-services websites should comply with WCAG guidelines at a minimum. ITA also conducts special training for PwDs and elderly. ITA also introduced an initiative for

government websites which includes the provision of Text-to-Speech service which is now used in almost all Government websites[27].

Laws/services	Law number	Year Passed
e- Transactions Law	69/2008	2008
The Cyber Crime Law	12/2011	2011
Telecom Act	30/2002	2002

4. Employment in the ICT Sector

The Ministry of Manpower (MoMP) in Oman is responsible for the implementation of manpower-related policies aligned with the State economic and social objectives, including reducing unemployment rate.

represent almost 78% of those employed by the private sector in jobs related to that particular activity.

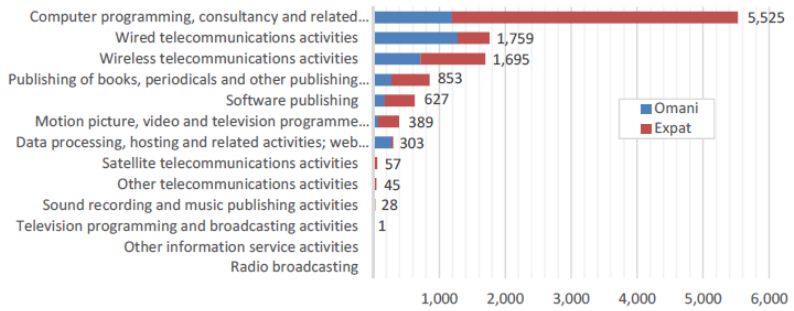


FIGURE 10: OMANI AND EXPAT WORKFORCE DISTRIBUTION BY ACTIVITY

Workers employed by the private sector in telecom related activities are the next largest group and represent nearly 31% of the total. Omani workers dominate the wired telecom sectors while expats are the majority in wireless telecom related activities. The below provides an overview of the ration of Omani to expat workers in each major ICT work area.

[27] https://omanportal.gov.om/wps/wcm/connect/33b89cad-5687-4a14-a045-0a994be139e7/3.+e-Accessibility%2BPolicy%28Ver1.0%29.pdf?MOD=AJPERES&CACHEID=33b89cad-5687-4a14-a045-0a994be139e7

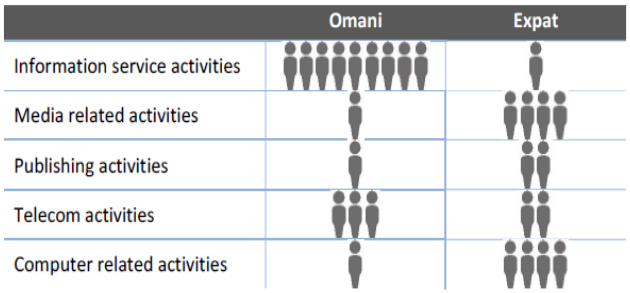


TABLE 3: RATIO OF OMANI TO EXPAT WORKERS IN MAJOR ICT ACTIVITIES

In terms of total number, Table 4 provides the snapshot of private sectors employment status as of 2017.

Description	Omani	Expat	Total
Television programming and broadcasting activities		1	1
Sound recording and music publishing activities	14	14	28
Other telecommunications activities	10	35	45
Satellite telecommunications activities	21	36	57
Data processing, hosting and related activities; web portals	276	27	303
Motion picture, video and television programing activities	78	311	389
Software publishing	170	457	627
Publishing of books, periodicals and other publishing activities	268	585	853
Wireless telecommunications activities	714	981	1,695
Wired telecommunications activities	1,283	476	1,759
Computer programming, consultancy and related activities	1,194	4,331	5,525
Total	**4,028**	**7,254**	**11,282**

TABLE 4: NUMBER OF WORKERS IN ICT ACTIVITIES

As per *ResearchGate article by Sami A Khan*[28] *quote* "The long term development strategy, "Vision 2020" adopted by Oman has provided an encouraging environment for women entrepreneurs to participate and contribute towards economic growth. Availability of education, training and awareness have helped Omani women to emancipate in recent past, and consequently, Oman has a significant number of women entrepreneurs in the male dominated Arab society. In Oman, two main programs namely "Fund for Development of Youth Projects" and the "SANAD" Program have been launched in recent years to promote entrepreneurship for both men and women. The Youth Fund was established in 1999 and it encourages young Omani men and women to start small and medium enterprises. This program has been successful to some extent in attracting young entrepreneurs"

5. *E-employment*

e-Recruitment is one of the integrated e-services offered to Omani citizens by Ministry of Manpower (MoPP). Realizing that the use of advanced ICT will facilitate transformation and enable increased efficiency and effectives of recruitment process, MoPP has developed the e-Recruitment System. MoMP is playing a key role in facilitating the matching of qualified Omani jobseekers to suitable jobs in private sectors, thus contributing to reducing unemployment rate in Oman. e-Recruitment system is designed as a single access point/single window which enables jobseekers to search, view and recommend themselves to suitable jobs in the private sector according to their qualifications in timely manner using MOMP website

[28] https://www.researchgate.net/publication/274898251_Women_Entrepreneurship_in_Oman

or mobile application. Employers can register a contract online and the system automatically assigns the contract to a job seeker with SMS along the contract information. Once the contract is accepted by the job seeker, the data related to job seeker is pushed to Public Authority of Manpower Register (PAMR) and Public Authority for Social Insurance (PASI).

Multiple channels through which the use of ICT was integrated in this regard, such as MoMP Portal website. Employer services are accessible 24/7 (Arabic and English) through 5 channels:

1. Ministry of Manpower Portal,
2. Namal mobile application,
3. Labor offices,
4. Call center
5. Sanad centers

Other services include:

- MoPP started implementing **The Business Employers Services (BES)** Portal which aims to facilitate and expedite the procedures for 199,811 investors, business owners and entrepreneurs in the private sector to employ the Omani and non-Omani manpower. It provides them with a set of integrated electronic services necessary to smoothly and transparently manage the data of 240,102 Omani and 1,689,562 non-Omani workforces around the clock. Services are designed as per employee life cycle and divided into:
    - Omani manpower services facilitate the management of national manpower recruitment process in the private sector, from nomination of job seekers to job opportunities, the registration of employment contracts and ending with resignation and termination of services.
    - Non-Omani manpower services include licenses for the recruitment of non-Omani manpower, issuing and renewing work cards, transfer of non-Omani manpower services from one establishment to another, submission of a work permit, cancellation of the work permit and final departure of workers.
    - 52% of these services are self-sufficient that do not require human intervention by the Ministry's employees to complete the procedures and feed the system with the necessary data to automatically approve applications through electronic integration with government agencies, electronic authentication to verify the applicant's identity, and electronic payment of fees and fines for each service.

- **Sanad Services Centers:** 707 centers distributed across 11 regions, providing online service through MoMP portal to beneficiaries with difficulty dealing with modern technology or lack access to internet.
- **Call Center:** using IVR technology (Interactive Voice Response),
    - Equipped with 11 trained agents, available from 08:00-02:00.
    - Center agents share status and coordinate with responsible departments on service requests.
    - Annually, they receive about 50,000 calls and maintain a positive average service completion rate of 88.5% over past 3 years.
- **MoMP offices (number 46 / 11 region):** through 46 offices located in 11 regions, end users receive awareness, guidance and assistance on submitting BES services by specialized staff providing.
- **Mobil Application:** Android application that offers MoMP mobile services including BES
    - installed by over 1,102 total users' reviews
    - Rate for 3.6+, latest updated in March 2017.

MoMP database holds most important data in the country, integrated with 27 government entities to share and collect accurate data. Most of e-Employment related data are collected from source through web services. BES produce and publish visualized data through Open Data. This includes: .

- **Technical Education** dataset, generated from student registration system, data review of students in Colleges of Technology to help in planning for job creation and improving the labor market. BES performance presented in live data count of achievements of set KPIs under commercial services, with highest record of 307,868 total Cards Renewal requests. Plans would include exploring and generating more BES data sets requested by public, further improve data integration with government and private sector and use impact and feedback to improve business services
- **Omanization** rate live data sets are generated from labor registration system, reviewing Omanization indicators in private sector according to main characteristics (location, skill levels, occupational sections, age categories, educational levels, establishment grade, and economic sector). Data sets are used to follow up on Omanization plan in the private sector and help in decision-making and review of relevant policies and foreign labor recruitment.
- **Employment data** sets are generated from labour registration system, reviewing data related to national manpower according to demographic main characteristics, site and establishment grade. Data sets used to assess employment rate, promote planning and national plans, budgeting and forecasting.

The BES outreach, awareness and ongoing communication campaigns are targeting job seekers, business owners, and investors through different channels like:

- Twitter: (@manpowergov) with 227K followers, and 6,012 tweets (01/08/2018)
- Media campaigns, workshops, seminars and social media for the users including jobseekers, businesses, SME entrepreneurs and employees to inform those users about BES e-services.
- MOMP creates and publishes videos on YouTube[29].
- MOMP accounts on Facebook and Instagram.
- Interviews on TV and radio or articles published on leading print newspapers held by the MoMP concerned staff to explain the MoMP e-services for the public.
- MOMP organizes employment exhibitions to provide opportunity for both jobseekers (men & women) and employers alike.
- Employers can meet, inform and interview hundreds of potential qualified applicants, while job seekers (men & women, including PwDs) can get the suitable job vacancy. Once they reached an agreement, then can use BES for registering contract immediately

Joint Recruitment Portal (PetroJobs.om)

As part of improving the consistency, integrity and transparency of the recruitment process across all Oil & Gas operators, it was agreed to establish a joint recruitment portal for the operators. This portal is the one-stop-shop for the job seekers to find and apply for the vacancies of 8 operating companies.

Below are some statistics on the website:

[29] https://www.youtube.com/watch?v=ck26AypzOws

Registered Users	72,839
Applied Candidates	56051
No. of Vacancies	636

Nationality	%
Omani	84%
Others	16%

Gender	%
Female	79%
Male	21%

Experience	%
0 to 3	83%
4 to 5	2%
6 to 10	6%
10 to 15	5%
over 15	4%

Region	%
Al Dakhiliyah	17%
Al Dhahirah	7%
Al Batinah North	10%
Al Batinah South	8%
Al Buraimi	1%
Al Sharqiyah North	6%
Al Sharqiyah South	4%
Dhofar	1%
Muscat	44%
Musandam	0%
Al Wusta	1%

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

A. Inclusive and Empowering access to relevant information, knowledge, applications and content (C3)

1. Inclusive and Empowering access to relevant information, knowledge, applications and content

It has been the policy of the government to promote and increase access to public domain information to ensure transparency and reliability of public institutions. Government institutions are encouraged to make open government data public through a central open data portal. Realising the benefits of open data usage by different communities for the interest of the society in general. Different initiatives have been introduced by different stakeholders in several sectors. The details of such initiatives are as follows:

The National Center for Statistics and Information (**NCSI) Data portal**[30]

[30] https://ncsi.gov.om/Pages/NCSI.aspx

NCSI was established in accordance with the Royal Decree no. 31/2012 affiliated to the Supreme Council for Planning. NCSI Data Portal launched as a free data-sharing portal where anyone can access data relating to the Sultanate of Oman. The Data Portal provides many datasets from different entities, for everyone - citizen, investors, researchers or developers.

Oman National Spatial Data Infrastructure[31]

Oman National Spatial Data Infrastructure (**ONSDI**) is a government initiative. it is conceived to provide a framework for geospatial standards, policies, institutional arrangements, and technology infrastructure necessary to coordinate, facilitate, and support the sharing and utilization of geospatial Information across multiple government organizations in the Sultanate of Oman.

Ministry of Education Open Data Library[32]

The Ministry of Education designed an Open Data Library at the Oman Educational Portal to provide an enabling provision for proactive and open access to the Ministry's data. It offers data related to Oman government schools and private schools, students, classes, teachers, administrators, special education, literacy and adults 'education. The data can be freely accessed, reused, modified and shared. It can be also utilized by any organization, such as corporations, universities, NGOs, startups, charities, community groups and individuals.

Moreover, the following are some other relevant initiatives/projects:

- ITA introduced an initiative along with the Ministry of Tourism in 2014 to equip cultural, heritage and other points of interest locations with free WiFi connectivity for the public and the tourists.
- In 2011, ITA launched the National PC Initiative and distributed more than 65,000 3G modems along with the PCs to the beneficiaries, including higher education students who received more than 51,000 3G modems free of charge for one-year validity and 1GB per month subscription.
- Sultanate of Oman started restructuring the domestic transportation sector and created new companies providing transportation services between and within major cities. In 2018, those companies equipped their transportation vehicles with internet services free of charge as additional value-added services.
- Most of the shopping malls, airports, hospitals, universities and attractive tourism locations in Oman covered with WiFi service. The number of mobile Free WiFi hotspots in Oman estimated to be 84,418.
- Most of the public administration offices have information counters which provides help services and assistance to users. These services are automated through interactive kiosks, contact centres and websites.

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

[31] http://nsdig2gapps.ncsi.gov.om/nsdiportal/

[32] http://opendata.moe.gov.om/

The social, economic, and political engagement of the society ensures its continuous development and well-being. Therefore, the government focuses on providing the society with the necessary ICT tools to access to information and participate in decision-making. It has set plans and programs that guarantee that every member (citizens, migrants, women, children, youth and person with disabilities) of the society gets equal e-services.

Public consultation and participation are an overall government direction mandated by His Majesty the Sultan to engage the public in shaping the directions of the country and contribute in all development decisions, policies and laws. As a result, government entities started engaging public through different means in their respective areas. Public consultation allows engagement with people having expertise in different disciplines and improve the quality of decisions made by the public institutions. This also helps to enhance the confidence of public in government decisions.

The following exhibit different initiatives by government entities supporting social, political and economic engagement:

- Bayan (Flexible, Accurate & Fast clearance of goods) - Royal Oman Police[33]
- Joint Supplier Registration System JSRS - Ministry of Oil & Gas[34]
- E-Transport Management System – Ministry of Education[35]
- Invest Easy (One Stope Shop) – Ministry of Commerce[36]
- Integrated Service for Job Seekers at Civil Service – Ministry of Civil Service
- Innovation Park Muscat[37]

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

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

The Ministry of Education (MoE) takes into consideration the adoption of ICT in the curriculum and teaching methods of early school levels. For instance, specific curriculum is designed by experts in various levels of K12 based on information technology. In addition, there are well designed training courses to empower teachers in using ICT in their teaching process. Moreover, teachers are provided with high-quality professional courses in ICT such as Intel programs and Microsoft programs. These courses are taught by skilful teachers and expert trainers at the Ministry training centres. However, there is some budget cut in training programs due to the financial consideration in the last two years.

[33] https://www.customs.gov.om/dgcportal/web/dgc/home

[34] https://www.businessgateways.com/

[35] http://home.moe.gov.om/arabic/

[36] https://www.business.gov.om/wps/portal/

[37] https://www.ipm.om/en/Pages/home.aspx

Furthermore, the curricula for all school levels can be fully accessed online via the MoE portal[38]. Teachers, supervisors and students can explore and download digital materials that support their teaching and learning process.

Regarding Higher Education:

- **Sultan Qaboos University - Promoting e-learning and self-learning[39]**

The e-learning service offers online learning to students and employees, and this service is provided by the Center for Education Technologies (CET).

- **Colleges of Applied Sciences**

The Colleges of Applied Sciences, since their inception in 2007, have invested in Blackboard Learn as an LMS and encouraged students and faculty to put it into effect as a main tool. Students receive digital course materials through Blackboard, take electronic quizzes and view their marks of the assignments on Blackboard. The faculty also uses Safe Assign as integrated in Blackboard to verify students' coursework against plagiarism. Students also evaluate the courses' effectiveness and faculty members' teaching qualities through surveys administered in Blackboard at the end of every semester.

Students have access to an online portal, developed in house, where they can register for classes, view their final marks, and view their absentee details. The faculty interacts with the portal on daily basis to enter students' absentee details, view and print class roaster and – at the end of the semester -register student final marks.

The available Systems are:

- Student information system
- E-Learning system (Blackboard)
- Libraries system (symphony)
- Email

- **The College of Sharia Sciences - Distance learning programs[40]:**

It seeks to facilitate ways to receive knowledge with the latest and best technology to preserve values and ideals through higher education and scientific research.

- **The Research Counsel -** The Oman Digital Academic Library (ODAL)[41]:

[38] http://ict.moe.gov.om/

[39] https://elearn.squ.edu.om/

[40] https://el-css.edu.om/

[41] https://www.trc.gov.om/trcweb/topics/eservices/43

The Oman Digital Academic Library (ODAL) has been created to foster knowledge by providing college and school students with access to free and open high-quality university level educational content. It also facilitates access to existing and emerging technologies.

TRC joined the Open Courseware Consortium (OCW), a global body of higher education institutions and associated organizations, to achieve this objective. Apart from Open Course Ware content, the library includes video lectures on technology, engineering, mathematics, science and management concepts, as well as dissertations, journals and e-books covering academic, creative and scientific developments at all levels.

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

For the sustainable development of information society, capacity building for necessary skills is essential. There are several programs for capacity building initiated and are running successfully across the Sultanate catering for the need of different segments of the society. The details of such initiatives are as follows[42]:

- **National IT Training & Awareness Framework Initiative (NITTA)**

The National IT Training & Awareness Framework Initiative (NITTA) is a government, nation-wide e.Oman initiative aimed at developing ICT skills and capabilities and increasing ICT awareness within the government and the community. The Initiative aims to provide ICT training opportunities to the citizens of Oman in order to enable them to participate fully in a digital, knowledge-based society. In achieving its goals, the Initiative also contributes to Oman's transformation to become a digital society, to the development of a local ICT industry and to create employment opportunities for the youth of Oman.

NITTA has given rise to a number of key projects and initiatives:

- **Government IT Training & Certification (GITTC)**

The Government IT Training and Certification (GITC) is one of the projects under NITTA. It aims to provide internationally recognized digital literacy certification to all civil service employees.

Project Benefits

- Improves the skills and performance of civil servants.
- Empowers civil servants under the Ministry of Civil Services with ICT knowledge and skills to enable delivery of public sector e-services.
- Gives an equal chance of training for all civil servants.

- **Community IT Training Project (CITT)**

The CITT project, regarded as a fundamental part of the NITTA framework, aims at activating sustainable learning at all levels of Omani society, as well as enhancing citizens' abilities and skills in handling modern digital technology and interacting with eServices. CITT aims to deliver IT literacy training programs to the

[42] https://www.ita.gov.om/ITAPortal/Pages/Page.aspx?NID=762&PID=2988

community through Community Knowledge Centers (CKC), which have been established throughout the Sultanate.

CKCs provide a venue to enable the provision of free cost education in computer and internet basics, in an effort to reduce computer illiteracy and bridge the digital divide. CKCs also aim to help and assist people to expand their access to information, improve productivity, enhance quality of life, and enrich culture and tradition by enhancing communication and interaction.

Government IT Training and Certification (GITTC)	Community IT Training (CITT)
75,000	57,000

- **Specialized IT Training Courses**

This program focuses on providing specialized IT training courses and granting opportunities to obtain specialized certificates, with a view to increasing the number of holders of specialized certificates in the different fields of information technology. The program contributes to meeting the current needs for the ICT industry in the public and private sectors, as well as satisfying future needs so as to enhance the growth of the local ICT sector.

- **IT Kid Innovation Theatre**[43]

IT Kid Innovation Theatre (IT KIT) targets kids from grade 7 to 9 between the age of 9-12 years. It was planned for the summer school holiday 2018 from July to August. IT KIT is carried out in partnership with the public and private sector, which aims to increase the opportunity for the kids to explore and improve creativity, knowledge and skills in ICT. IT KIT was very successful where 40 students were trained in 4 different areas: security, open source, digital content and innovation.

They are all accessible to people with disabilities depending on their prequalification and willingness to be enrolled in the training programs. Furthermore, NGOs are collaborating with ITA to jointly provide basic IT training to people with special needs such as blind, deaf and mute, and equipping their association centres with assistive technologies and materials for future training and other educational activities. Good example is Alnoor Association for the Blinds in Nizwa region and deaf club in Al Buraimi region. 80 persons with disabilities were trained since ITA's training initiative started.

C. ICT applications (C7)

1. E-Government

Adoption and use of digital technologies are an enabler for achieving the goals of the national strategies focussing on sustainable development in the fields of public administration, business, education and training, healthcare and employment. The details of ICT application in different sectors are as follows:

[43] https://www.omanobserver.om/article/29275/Business/ita-organises-it-kids-innovation-theatre

The e-Government Transformation Plan is a national project that aims at accomplishing the full e-transformation in the government services and transactions to assure a sustainable knowledge-based society and economy. It seeks to enhance the quality of the government services and the service provision methods as per certain regulations, standards and stages to meet the goal of simplifying the services for the citizens, business and government entities. As part of ITA's ongoing efforts to implement the e-Government transformation plan, approved by the Cabinet in June 2012, 300 e-government services were launched since then**.**

- Bayan system[44] is an online single window/one-stop service offered by Royal Oman Police (ROP) - Directorate General of Customs to facilitate seamless, convenient and fast clearance of goods for trading communities & various stakeholders. The Bayan system provides advanced services to the trade community aiming to reduce their administrative and logistical burden.
- The oman.om[45] portal is the gateway to services and information from the government in the Sultanate of Oman. Through the portal, the public will have access to services, where they can use them electronically or find information about where and how to get other services. This is via SMS services or forms that ca be downloaded.
- Moreover, the National e-Payment Gateway (ePG)[46] provides an operational component of the e-governance infrastructure and full e-commerce facilities that allow secure online payments (e-payments).

The National Donor and Donation Registry (NBDR)[47]

The National Donor and Donation Registry (NBDR) system integrates the different blood banks within sultanate to build a central donor and donation registry, blood product inventory, and a transfusion database so that a nation-wide safe blood donation and transfusion environment can be achieved through this integration and sharing of data. The NBDR system is centrally hosted and is integrated with the blood bank systems across sultanate through the MoH health intranet (Health Net).

Name of Authority in Charge of ICT in Public Administrations	*English Name: Information Technology Authority* *Arabic Name: هيئة تقنية المعلومات* *URL: ita.gov.om*

[44] https://www.customs.gov.om/dgcportal/ar/home/

[45] http://oman.om/wps/portal/index/!ut/p/a1/04_Sj9CPykssy0xPLMnMz0vMAfGjzOKNDdwNDPwtPX29Q3wdDYyMw9y8LH3MjF1cTIAKIoEKDHAARwNC-sP1o8BK8JhQkBthkO6oqAgAFdYtmg!!/dl5/d5/L0lDU1EvUU5RSy80SlNFL2Fy/

[46] http://oman.om/wps/portal/!ut/p/a1/04_Sj9CPykssy0xPLMnMz0vMAfGjzOKNDdwNDPwtPX1NgsMMDYy83FxMLYLNjdxNDIAKIoEKDHAARwNU_d4hvo4GRsZhbl6WPmbGLi4mUP14FBCwP1w_CqwEnwsIuSE4NU-_IDc0wiDLRBEAK2N9BA!!/dl5/d5/L2dJQSEvUUt3QS80SmlFL1o2XzMwRzAwTzIJTTRCUUQwMkoySzVTQTMyMFM0/?WCM_GLOBAL_CONTEXT=/EN/site/home/epayment/epayment

[47] https://omanportal.gov.om/wps/wcm/connect/EN/site/home/gov/gov22/NBDR/

Name of e-Government authority	*English Name: Information Technology Authority* *Arabic Name: هيئة تقنية المعلومات* *URL: ita.gov.om*
Number of implemented government e-services	*300*
Number of planned government e-services	*785*

- **E-Tendering**

The e-Tendering initiative is based on Oman government's national plan of e-Transformation. It is a centralized tender management system & processes that helps in achieving higher efficiency and enhance elements of transparency and accuracy in government tendering processes with considerable cost-savings. E-Tendering makes it possible for government entities to prepare, float, evaluate and award tenders online in addition to allowing companies to register/renew registration with Tender Board online including printing registration certificates.

The e-Tendering system, hosted on G-Cloud platform, is integrated with the following entities and aims to providing service to the public entities in Oman:

- E.Oman integration platform to use web services from following entities
  - Ministry of Commerce and Industry
  - Ministry of Manpower
- E-payment gateway (CyberSource, MIGs, CBO Net e-payment methods)
- SMS for informing the stakeholders on registration of users, companies and tenders
- PKI integration
- E-Tendering web service to help entities to integrate with e-Tendering to access the tenders, company registration and ministry information

55+ Government entities are using the e-Tendering system.

- **Sultan Qaboos Award for Excellence in e-Government**[48]

His Majesty Sultan Qaboos Award for Excellence in e-Government aspires to bring about both qualitative and quantitative transformation in the public service delivery by honoring e-governance/technology projects that have resulted in exceptional achievements with regard to the reengineering of the delivery of electronic public services.

The Award invites entities to bolster the national information society by nurturing an interactive, proactive and reactive e-community in line with the e.Oman vision and by strengthening ICT utilization for higher economic, social and cultural progress.

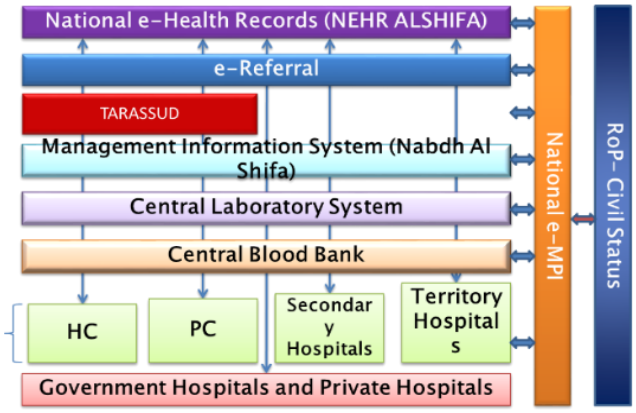
[48] https://egov.unu.edu/news/news/sultan-qaboos-award-for-excellence-in-e-government-2016.html#:~:text=The%20Sultan%20Qaboos%20Awards%20for,quality%20of%20public%20service%20delivery.

2. E-Health

The Ministry of Health launched its eHealth initiative to build an interoperable health IT ecosystem for the entire nation, which becomes a platform for healthcare data sharing among multiple stakeholders. This initiative was driven by the desire to achieve the efficiencies required to address current challenges, such as: spiraling costs, staff shortages, tightening regulatory requirements, increased burden of chronic disease and rising patient expectations. The eHealth ecosystem depends on the shared clinical repository based on open standards and a set of well-defined interfaces that promote interoperability and a set of value-added multi-channel applications to provide secure, intelligent, context-sensitive and 3600 access to this repository.

The e-Health Portal (EHP) launched in 2015 hosting an electronic Health Education Library[49] that includes pamphlets and videos on various health topics and issues, in both languages (Arabic & English). Some of the topics include HIV, safe use of medical drugs, smoking, H1N1, and personal hygiene. The electronic Health Education Library includes material to raise awareness about birth spacing (control), antenatal and postnatal care, as well as breastfeeding. There is no underserved areas and vulnerable populations in Oman. Most of the areas are covered by MoH health centres and services.

Oman eHealth Framework



Furthermore, **AJYAL** project is an integral component of the eHealth initiative and it envisions building a nation-wide registry of all the birth and death reported to healthcare facilities (MOH, non-MOH; government and private) which could be securely shared between different stakeholders. As the public service simplification is at the core of the eHealth initiative's goals, the project scope included the entire paradigm of birth and death certification process through interconnecting the health institutions and National Registration System (NRS) of the Royal Oman Police (ROP) and the automation of the workflows involved.

[49] https://moh.gov.om/en/web/department-of-health-education-information/elibrary

V. Cluster Five: Culture and Media Policy Areas

A. Cultural identity and linguistic diversity (C8)

While developing information society, respect for cultural identity, traditions and religion is essential. Sultanate of Oman is ensuring cultural and linguistic diversity through adopting a holistic approach for digital content development and preserving the national heritage.

ITA issued Website and Data Hosting Policy that has been published and circulated to government agencies through ITA circular number 6/2018 on November 06, 2018. The policy states that all government agencies websites should minimally be bilingual (Arabic and English). The National Records and Archives Authority (NRAA)[50] has two major electronic restoration systems, started in 2013, which are:

1. Archive Management System, which complies with international standard for preservation of digital records and keeps different copy of electronic records in different places. it also allows the researcher to search for different types of records. In addition, NRAA has a scanning department, which digitized all physical records.
2. Electronic Documents and Records Management System that helps to manage the records in all government according to law and roles set by NRAA to protect the electronic records from the stage of its creation until it is being transferred and preserved in NRAA.
   Digitally archived documents are accessible based on request on NRAA website.

Ministry of Culture and Heritage

The Ministry is working on some electronic preservation methods including, Electronic Portal for Manuscripts. The Ministry is currently developing a manuscript site in agreement with Omantel to be offered free of charge to the public from inside and outside the Sultanate. The site contains four thousand historical manuscripts that can be increased by digital copies that can be downloaded.

Since 2009, the process of digitizing more than 4,000 manuscripts has been completed, including the Quran, Science of Hadith, jurisprudence, interpretation, history, applied sciences, Arabic language, philosophy and literature, as well as more than 490 external works, most of it belongs to civil libraries .The digitization process goes through three stages, first one is restoration and sterilization of the manuscripts, second is the use of an advanced automatic copier for photocopying manuscripts and preserving the manuscript in three formats (jpg, tif, pdf). The third stage is to store them in storage capacity owned by Ministry of Heritage and Culture.

for the use of social media, the National Museum created an official Facebook account, by which it allows visitors to share their experiences, photos, and suggestions.

[50] https://nraa.gov.om/national-records-and-archives-authority-issued-part-viii/?lang=en

B. Media (C9)

1. Media diversity, independence and pluralism

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.

Freedom and plurality of information is guaranteed by law in Article (31) of Oman's Basic Law of the State. The Basic Law provides for the foundation of a secure future for Oman and it enhances the country's status internationally by highlighting its belief in peace and cooperation between nations and peoples. It provides maximum safeguards to protect the freedom, dignity and rights of the individual. It raises the status of law to the highest sovereign standards recognized internationally.

The Sultanate of Oman has several (government and private) printed newspapers, electronic newspapers and news sites, radio stations, television channels and social media. There are several ways to disseminate the news, reports, articles, events or special interest matters. The following table demonstrates the different categories of media outlets in Oman highlighting their numbers, language and ownership:

Media outlets	Number	Language(s)	Ownership			
			Private	Mixed	Government	Foreign
Newspapers	1	Arabic government	13		2	
	1	English government				
	10	Arabic private				
	3	English				
Electronic newspapers	7	Arabic	7			
Magazines	17	Arabic government magazine	31		28	
	3	English government magazine				
	8	Mixed Arabic and English government magazine				
	27	Arabic private magazine				
	4	English private magazine				
News agency	1	Arabic & English			1	
Radio stations	4	Arabic private radio	8		5	
	4	English private radio				
	4	Arabic government radio				
	1	English government radio				
Television stations	1	Arabic private	1		4	
	4	Arabic government TV stations				

Oman's official news agency is Oman News Agency (ONA). It offers coverage of events in the Sultanate and is made available to member institutions, while providing background and information material to reporters and media outlets based in the Sultanate. The agency also archives data and images relating to all events it covers.

The Ministry of Information (MoI), through the adopted policies in line with its espousal of the digital age, has multiple objectives including the priority of establishing strong presence for the Sultanate in various electronic media. This presence can be used to create an awareness of Oman's culture, unique identity, recent achievements and to promote specific sectors of the economy, always with an eye on maintaining or improving the quality of Omani content. MoI aim to be a trustworthy source of information by disseminating reliable information about the country, also by having a two-way communication with the public to provide the requested information and to correct misinformation about the Sultanate. It monitors and analyses all news and information of relevance to the Sultanate on various sites and platforms and it surveys public opinion regularly on such issues. MoI Ministry has media attachés in three capitals: Cairo, London and Washington.

In addition, MoI has a strong tradition of honest journalism and it is a reliable source of an accurate portrayal of the domestic development process at any time. Its reports are characterised by balance and clarity which goes in line with the highly values attributes in the philosophy of the country's modern Renaissance.

There are several legislations to organize the media sector under the MoI's vision. They are:

- Printing and Publishing Law
- Private Radio and TV Corporations Law
- Artworks Law

MoI also has taken a special interest in the regulatory framework that governs the Sultanate's media institutions, both government and private.

In this context, it has established a dedicated media licensing department among its newly organization chart. The new department, the Department of Media Licences, is affiliated to the Directorate General of Publications and Artworks. Its responsibilities include issuing work licenses to media institutions, ensuring they operate in compliance with the Printing and Publishing Law, the Law on Artworks and the Private Radio and Television Corporations Law. The Department issues work permits to press organizations and journalists, to radio and television companies and their personnel and to institutions operating in the field of audio and video creation and broadcast.

It also licenses the distribution of foreign newspapers within the Sultanate, as well as the work of publishing houses, book dealers, printing presses and other enterprises involved in the activity of disseminating information within the Sultanate. All licences are approved and issued by reference to the Sultanate's own cohesive social environment and extant media policy as it applies domestically and overseas.

Moreover, there is a Charter of Ethics of the media profession issued by the Omani Journalists Association (OJA), in cooperation with the Department of Information at Sultan Qaboos University (SQU) and Omani media institutions.

Clearly, gender rights and equality are respected in Omani media and in the Sultanate of Oman as a whole. Women in Oman enjoy a wide variety of roles and responsibilities. They have the right to vote and the right to contest elections and everything as their counterparts. However, the percentage of female media journalists/editors is only 28%. Nevertheless, the world is changing. As the old paradigms of media consumption are disrupted by new forms of entertainment, we may hope to see more women in the media field in the future.

2. The media and its role in the Information Society

Future Knowledge Needs by the Omani Public from the Awareness Programmes is a survey study prepared by MoI in cooperation with Sultan Qaboos University (SQU) as per the instructions from the Council of Ministers. This study which is the first of its kind in the Sultanate, aims at identifying the needs of the Sultanate and evaluating its requirements in the field of public awareness. It also aims at ensuring greater satisfaction by the government and the public with relation to the government plans and programmes[51].

The Omani media maintains an intent focus on both individual and institutional performance. The Public Authority for Radio and Television (PART) was founded, and subsequently refined by Royal Decree No. 108/2010 and Royal Decree No.100/2011 respectively. PART is a legal entity with financial and administrative independence, and its affiliated to the Council of Ministers. PART derives its vision and mission from the philosophy of the country's modern Renaissance. Its programming is an embodiment of the public policies of the State in all fields. It espouses media values that praise development in social, cultural and economic aspects, and it promotes ethical norms and values and a more cohesive expression of national unity.

The digital media sector is the link that connects PART with the public online via digital services that deliver news over the internet and social media platforms. Now, 40 such subscribers and public web portals and phone apps are actively supplying news to the public, expanding the reach of broadcasters to new audiences. Young people are turning in ever greater numbers to hand-held devices for their consumption of news and PART's digital policy is responding to this trend.

Furthermore, there are stations operating in both Muscat and Salalah, with other television transmitters throughout the Sultanate, many of which are solar-powered. Also, there are several broadcast signals and the nodes of this network are connected by satellite so it can reach the rural areas.

In this regard, Omani media develop messages that are consistent to the needs and priorities of the public, taking into account the types, quality, attractiveness and promotion in their consideration of rural areas. Also, there are printed newspapers and magazines distributed all over the country and several tabloid format weeklies dominated by entertainment, sport and advertising themes. They are delivered free-of-charge with their parent newspapers or distributed individually. Also, internet is available in rural areas which ensures people access to information and knowledge.

3. Convergence between ICT and the media

MoI works on enhance the preparedness for convergence triple play, which has developed the performance of the electronic media and develop an integrated plan for media services, hence it has won the 2018 edition of the Sultan Qaboos Award for the best e-Transformation Achievement.

[51] https://www.pressreader.com/oman/oman-daily-observer/20150605/281595239144398

4. Social Media in the Arab World

Social media plays a major role in raising awareness in communities, promoting innovative ideas and leading social change by influencing knowledge, values, beliefs and behaviours. In this regard, all institutions in the Sultanate have devoted great attention to the use of social media in spreading awareness and news and engaging the public in decision-making on some issues. The government established the Government Communication Center in 2017 to be responsible for publishing awareness campaigns on all the activities of government institutions in the Sultanate.

According to a number of surveys and studies conducted by some bodies in the Sultanate, including the survey of the confidence of Omani citizens in the media in 2015, conducted by the National Centre for Statistics and Information, the confidence of the citizen in the electronic media in general increases between females than males. Online news sites are 88 points among females against 82 points for males. The confidence index in social networking sites also is higher by females (56 points) than males (48 points)[52].

In another survey conducted by the Sultan Qaboos University in 2017 entitled "Future Knowledge Needs of the Omani Audience from Awareness Programs," some of the findings of the study concluded that new means of communication in the World Wide Web, social networking sites and smart phone applications have achieved high averages, and this demonstrates the importance of this means because of the high exposure to it..

In view of the results, 71% of those exposed to the global information network are permanently exposed to the network, while 66.4% are exposed to television permanently, and 62.9% are exposed to social networking sites permanently. According to these findings, it can be concluded that the use of a combination of means within outreach programs may contribute to a wider dissemination of the message, focusing on the methods that are more likely to be exposed and permanently exposed.

[52] https://www.ncsi.gov.om/news/pages/newsct_20150519114220952.aspx