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Digital Arabic Content

Background Paper

1. BACKGROUND

Digital Content has many *forms* (text, image, video, animation, audio, maps, or e-applications) and is in use for many *functions* (communication, news, networking, recruitment, entertainment, e-commerce, topic search, location based services, education, training, etc.). There are many *tools* and *technologies* to create and disseminate content. *Online* Digital content is the main driver for development of the Internet Ecosystem. Digital content is also penetrating broadcasting (TVs & Radio), Books, Music, Cinema, as we are becoming more and more a digital world. Digital content should be looked upon within the context of the environment and mechanisms to create, store, communicate and present it. This is not limited to the technological, but also the legal, and cultural dimensions. This holistic view is essential to deal with the right issues for its development. This topic has been addressed directly by the World Summit on the Information Society (WSIS) where ITU is the Co-Facilitator of WSIS Action Lines: C3 (Access to *information and knowledge*), C8 (Cultural diversity and identity, linguistic diversity and *local content*).

It has been widely recognized that socio-economic development is greatly enhanced by adoption of Internet. This has led most countries to increase Internet access in order to narrow disparity across countries and communities "*digital divide*". "*The most important digital divide is the content divide*" WSA Chairman Peter Bruck said at the sixth Internet Governance Forum in Nairobi, 2011. A new study[1] has built upon that demographic, economic and infrastructures determinants of Internet access are difficult to change in the short run, while it demonstrated that a statistically and economically significant effect can be achieved by adopting policies of promoting content creation resulting in increase of Internet adoption even in the short run. It is important to have quality content that is relevant to the user/consumer. This is reflected in several issues including the *language* of the content (in our case Arabic) and its *affordability*[2] . Relevant Content also must be based on actual *needs* of the users. It is also imperative to have good *directories* and *search engines* for the content sites in order to be able to reach it in the first place.

The fastest growing component of content is *broadband*. Broadband content requires a streamlined operation from the international bandwidth connection to Internet Exchange Points to Data Centers to Backbone to Backhaul to Last mile. Limitations on any of these stages will result in lowering the performance of the infrastructure needed to disseminate the content and reflects on its affordability and use. Right combination of technologies, copper, fiber & wireless is dependent upon the density of the population and the area covered. It is important to have a good management of spectrum, which is one of the rare national resources (like energy and water) and its efficiency of utilization is becoming a key issue in the broadband era. The digital content is affecting the traditional media (TV, Newspaper, Books, Radio, and Cinema). A recent study of FCC[3] has stressed the need of having the media system in a more *integrated*

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[1] Viard, V. B. (2011, April 1). *The Effect of Content on Global Internet Adoption and the Global "Digital Divide".* Retrieved November 22, 2011, from The Networks, Electronic Commerce, and Telecommunications ("NET") Institute: http://lsr.nellco.org/cgi/viewcontent.cgi?article=1252&context=nyu_lewp

[2] Information Society: Statistical Profiles 2009, Arab States, ITU-D.

[3] Waldman, S. (July 2011). *THE INFORMATION NEEDS OF COMMUNITIES: The changing media landscape in a broadband age,* Federal Communications Commission, www.fcc.gov/infoneedsreport

regulatory system where there is a balance between the users (demand side) and the producers (supply side).

The important role of *policies* and *strategies* has been outlined in several important works of OECD[4]. These include policy principles [5] will help promote an *enabling environment*, enhance the *infrastructure*, and foster a business and regulatory climate conducive to the creation, access to and preservation of digital content. A recommendation was adopted by OECD Council in 2008 to provide a general framework for the wider and more effective use of public sector information and content and the generation of new uses from it. The role of public sector (government) is key, since governments have a lot of content and useful information. The outline says "Digital content has become an increasingly important and pervasive factor shaping economic and social development. High-speed communications, increasing *upstream* as well as downstream bandwidth, declining access prices, convergence of previously distinct networks, innovation in new devices and applications and lower entry barriers will drive new ways of creating, distributing, preserving, and accessing digital content. As economies move towards being more knowledge-intensive, information-rich activities in which content is created, collected, managed, processed, stored, delivered, and accessed are spreading into a broad range of industries, contributing to further innovation, growth and employment. Digital content is becoming central in research, health, education and social services, knowledge and cultural services and government. It is also stimulating increased participation and creative supply by users."

ITU has developed a set of guidelines for digitalization and the roadmaps for digital dividend, as analog broadcasting is being replaced by digital broadcasting.[6]

Digital content might be grouped into three main domains; *public* sector, *personal*/*social* (user generated content), and *commercial domains*. It is important to distinguish these three domains for effective development. Financing of these domains will require different mechanisms for sustainability. Combination of Innovative Business Models and National/Regional/International Policies are needed to ensure that markets are developed and the revenues are directed to balanced development between infrastructure and content. This is especially important as the user seems to be unwilling to pay to many suppliers. Advertising alone will not generate enough revenues for quality content. Commercialization of digital content has been successful in limited cases like the case of Apple. Issues of Intellectual Property Rights and the right balance between privacy and security need to be addressed for digital content. Proper authentication using Federated Identity Management is gaining ground. However, piracy and child pornography and other relevant issues in the Cybersecurity domain need a lot of work for harmonization between countries, as the Internet has no boundaries.

The landscape of digital content has been very dynamic and new schemes have been introduced; as for the collaborative work, central for developing Wikipedia, users become producers like YouTube, spread of Twitter as speedy links to content, the portfolio of Google on many digital contents from maps to books to blogs to translation. It is becoming evident that the role of social networks and blogging is changing the landscape of media. Emergence of Digital Object Identifier is expected to grow with the Internet of things.

The role of digital content in shaping our life is fundamental and several organizations/platforms like UNESCO, ITU, and IGF have contributed to and will continue to contribute to this vibrant domain. Close coordination between them and others is needed, as the digital content is greatly affected by and affects the required infrastructure as seen by the recent study of OECD, ISOC and UNESCO, which was presented and discussed in IGF 2011[7]. ESCWA have worked on Digital Arabic Content since 2003 and published various reports related to Digital Arabic Content Industry[8] in addition ESCWA implemented a regional project for development on digital Arab content from 2007-2009[9] through incubation.

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[4] OECD Working Party on the Information Economy, www.oecd.org/sti/digitalcontent.

[5] DIGITAL BROADBAND CONTENT: Digital content strategies and policies, 2006. http://www.oecd.org/dataoecd/54/36/36854975.pdf

[6] Guidelines for the transition from analogue to digital broadcasting, 2011, ITU-D.

[7] The Relationship between Local Content, Internet Development and Access Prices, http://www.oecd.org/dataoecd/4/41/48761013.pdf

[8] http://www.escwa.un.org/divisions/projects/dac/docs.asp

[9] Review of Information and Communications Technology and Development, Issue 13, in Arabic http://www.escwa.un.org/information/publications/edit/upload/ictd-10-1-a.pdf

One of the main issues which need to be agreed upon is the need to standardize the digital content indicators which are really needed in order to develop comprehensive strategies. See Annex I for a proposed list of indicators from several organizations.

2. PURPOSE OF THIS PAPER

This paper is targeted to outline the digital content dimensions and landscape in the Arab region and benchmark it with the international standards. This will therefore be used to identify and recommend what needs to be done in terms of actions for studies, policies, plans, initiatives/programs/projects to develop the Digital Content in the Arab region.

3. SUMMARY OF THE EXISTING SITUATION

Several Arab Countries have worked on developing digital content in the last several years. These mainly were done mainly by developing many projects. One of the earliest that started in 2000 and is still active, is the Center for Documentation of Cultural and Natural Heritage, CULTNAT of Egypt (http://www.cultnat.org/). Saudi Arabia, and Qatar have recently published strategies and plans to develop digital content. The initiative of King Abdullah for Arabic Content[10] (Saudi Arabia) (http://www.econtent.org.sa) has over 60 projects and covers most of the aspects needed for developing digital content. In the Syrian Arab Republic, the government-formed Committee for Promoting the Arabic Language through its National Team for Digital Arabic Content launched three initiatives in March 2011 focusing on educational knowledge, standardization and audio-visual content[8]. Most of these projects can be repeated or coordinated within the Arabic region. Several countries have started mechanisms to develop Arab digital content creation, e.g. Qatar established a Digital Content Incubation Center to promote entrepreneurship related to the production of Arabic content; and a Creative Commons affiliate in Qatar to encourage and protect digital creativity. Twofour54 in Abu Dhabi; has also two initiatives; Creative Lab, which provides funding to promising ideas originated in the Arab world that are focused on the Arabic-speaking market, and Apps Arabia, which will invest in mobile application and will act as an interface between application developers and those with ideas for application content.

To get a comprehensive view of the digital content landscape in the Arab region; the work of Dubai Press Club on Digital Media Outlook [11] and of ICTQatar on Digital Media [12] and the report of CITC of Saudi Arabia on the Internet Ecosystem [13] have been consulted. All of these reports plus the report of ITU [2] have shown that despite of the current efforts, the situation in the Arab region requires a lot of improvement. Part of this may be due to limited coordination at the regional level in this regard, despite the strategy plan for ICT development at the Leagues of Arab States. Definitely there are exceptions, like the leading project of Mohammed bin Rashid Al Maktoum for digitization of Al Azhar manuscripts [14] and the work of ESCWA for the last several years [8], and the work of the World Digital Library initiated by the library of Congress and Bibliotheca Alexandrina [15]. This has led ITU to launch regional initiative on digital content during the Hyderabad action plan from 2011-2014.

A preliminary study was done by the Arab regional office of ITU in 2011, to analyze Online Digital Content in the Arab region using the available data from a number of international websites (ITU.int, Alexa.com, Google.com, HosterStats.com, Webhosting.info, Netcraft.com, icann.org, domaintools.com, ripe.net and isc.org). The study showed that the percentage of Arab countries in the sites of gTLD is 0.162% and the number of Internet Hosts in the region is 0.198% of the international figure and the percentage of Arabic ccTLD in the top 1 million sites is 0.187%. These three indicators have not been reported previously. Most

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[10] National Strategy for Digital Content, Part of King Abdullah for Arabic Content, (2011) . http://www.econtent.org.sa/MediaCenter/MediaCenter_DownloadsFiles/National_DigiContent_Strategy_v4_14.pdf

[11] ARAB MEDIA OUTLOOK 2009-2013: INSPIRING LOCAL CONTENT: FORECASTS AND ANALYSIS OF TRADITIONAL AND DIGITAL MEDIA IN THE ARAB WORLD, http://www.dpc.org.ae/UserFiles/AMO%20Eng%20combined.pdf

[12] Qatar's Digital Media Landscape 2011, http://www.ictqatar.qa/sites/default/files/documents/Qatar_s_Digital_Media_Landscape_2011.pdf

[13] IT Report 2010: On the Internet Ecosystem in Saudi Arabia, , http://www.itforum.sa/att/CITC%20IT%20Report%202010%20English.pdf

[14] 1,000-year-old Islamic manuscripts digitized, http://www.tradearabia.com/news/MEDIA_204129.html

[15] http://www.bibalex.org/isis/frontend/Projects/ProjectDetails.aspx?th=XXcd39qSOgW6ylM1XyXekw==&id=sKyrIIL4uUVkkSriojvN6q==#

of the other studies have used number of pages in Arabic and the estimates ranges from 1-3% [2,16]. "A number of online content and portals exist in Arabic (e.g. Maktoob.com, Jeeran.com, and Nassej.com); however, their contribution to the overall available Arabic content on the Internet is rather small." [2]. These percentages show that digital content in the Arab region is rather below the expected of the region which has 5.142% of the population and 3.835% of the global GDP.

The following table summarizes the results of the study, where indicators are ordered from the highest to the lowest to demonstrate if the content lags on the other hand.

Table 1: Comparative Analysis of Digital Content to Basic Indicators (2010)

Indicators	Arab Region	World Wide	Percentage
Land (Million Sq km)	13.14	136.4	9.63%
Mobile-cellular subscriptions (Millions)	312.6	5,385.7	5.8%
Population (Millions)	365.4	6,895.1	5.125%
Internet Users (Millions)	86.2	2,044.2	4.218%
GDP (PPP; Trillion USD)	2.86	74.5	3.835%
Households (Millions)	64.58	1,751.6	3.687%
Fixed-telephone lines (Millions)	35.51	1,189.3	2.986%
International Internet bandwidth (Mb/s) (Thousands)	834.34	59,119.7	1.411%
IP counts (Millions)	30.6	3463	0.884%
Internet Hosts (Millions)	1.52	764	0.198%
Number of cctld in the top 1 M sites	1'871	N/A	0.187%
Internet Sites (in gtld)	194'235	120'232'717	0.162%

Sources: ITU.int, Alexa.com, Google.com, HosterStats.com, Webhosting.info, Netcraft.com, icann.org, domaintools.com, ripe.net and isc.org.

The last three parameters show that hosting and sites are the most underdeveloped in the Arab region compared to other indicators, even the international internet connectivity. The content of this table is shown in Annex II for the whole 22 countries of the Arab region. We note that some other measures widely used may be misleading. For example, the number of pages in Wikipedia or indexed by Google as the content per page is quite different in terms of size, if you compare Arabic vs. English versions. There are currently many efforts to determine the right indicators for digital content. Part of these efforts is done within the scope of WSIS, which has target 9: "Encourage the development of content and put in place technical conditions in order to facilitate the presence and use of all world languages on the Internet". This is closely associated and a basic prerequisite to reach target 10 which stipulates: "Ensure that more than half the world's inhabitants have access to ICTs within their reach and make use of them". Illiteracy in the Arab region is still high compared to other regions. It ranges from 94.7% in Qatar to 37.8% in Somalia with an average value of 72.2% [17]. This is compared with an average of 82% globally.

In terms of the language of the Internet Users, The Arab Language lies in ranks no. 9 in the top 10 languages used on the internet [18,19], with a percentage of 18.8% of the Arab language speakers. The German language speakers have the highest of 79.5%, the Japanese the second with 78.4%, the Korean are the third with 55.2%. Only the French speakers' population has a lower percentage than the Arabic language with a 17.2%. So, for the Arab region to reach the 50% percent mark by 2015 is quite a challenging proposition. The Wikipedia[20] reports that, by April 2010, there were 125,100 articles in Arabic out of total of 15,205,883. Thus the Arabic ranked no. 113 of the reported 140 languages with 500 articles per million speakers. The number of articles in Arabic represents 0.82% of the total articles. The current

[16] Usage of Arabic for websites, http://w3techs.com/technologies/details/cl-ar-/all/all
[17] http://en.wikipedia.org/wiki/List_of_countries_by_literacy_rate
[18] Measuring the WSIS Targets: A statistical framework, ITU, 2011, http://www.itu.int/dms_pub/itu-d/opb/ind/D-IND-MEAS_WSIS-2011-PDF-E.pdf
[19] INTERNET WORLD USERS BY LANGUAGE http://www.internetworldstats.com/stats7.htm
[20] http://en.wikipedia.org/wiki/Wikipedia:Wikipedia_articles_per_population

data[21] shows that Arabic language is ranked the no. 25 language as per the total number of articles, having 166,654 articles with 980,854 pages.

According to alexa.com, only seven Arab digital content sites are in the top 1000 internet sites

Table 2: Arab Internet Sites in the top 1000 sites.

S.N.	Site Name	Alexa Rank Global	Reach
1	maktoob.com	219	0.6%
2	kooora.com	369	0.26%
3	youm7.com	480	0.2%
4	myegy.com	531	0.17%
5	fatakat.com	585	0.13%
6	aljazeera.net	754	0.124%
7	ahram.org.eg	916	0.12%

Of these seven sites, there are four sites which are pan Arab (Maktoob, Kooora, Fatakat, and Aljazeera) and three are from Egypt (Youm7, Myegy, Ahram). Egypt is the most populated Arab country and has the largest number of Internet users in the region. The main message from this that size matters and it is important to start to serve the large Arab market which has a unique feature of unified language and similar culture. An Arab site to achieve a reach of 3% comparable to the Arab internet Users percentage will be ranked in the top 20 sites globally. (ebay.com ranked 20 has a reach of 2.77 %). Looking at the demand side of the Internet Sites, we found that the local sites represent an average of 25% of the sites ranked in the top 10 sites for each country. These sites are mainly for news. It is imperative to see the effect that the language is playing in adoption of internet given the estimates that 60% of current Internet users prefer Arabic as the language of the Internet sites. It is estimated that 90% of the population has only fluency in the Arabic language.

But content reach has a cost which determines its affordability. This cost will determine the demand side consumption. So, it is imperative to investigate the existing situation regarding affordability, and actual consumption. The 2011 Telecommunications Retail Prices Benchmarking Report for Arab Countries [22] studies prices for the different Telecommunication services (Voice and Data over Fixed and Mobile) in the Arab region and benchmark these data with the OECD. See Annex III a summary of the prices quoted. The following graph shows the percentage ratio of the two groups. (Arab/OECD)

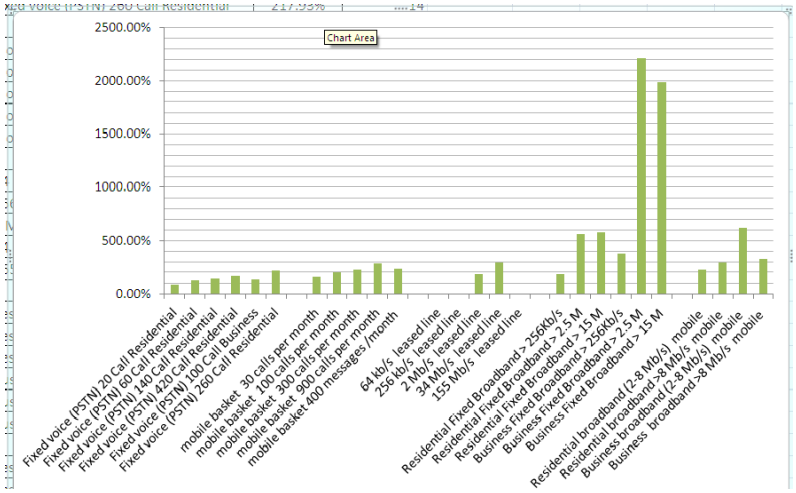

Figure 1: Percentage Ratio of Average Arab Price to OECD price for several services (2011). All prices are calculated in USD/PPP.

[21] http://meta.wikimedia.org/wiki/List_of_Wikipedias

[22] http://www.tra.org.bh/en/pdf/2011PricesBenchmarkingRepforArabCountries.pdf

The data shows that broadband prices are much higher in the Arab region than the equivalent OECD, with the highest is the broadband for business as high as 2215%. The data was further analyzed to get the price per 1 Mb/s and the average prices for 256Kb/s was $ 168, and $51 for 2.5 Mb/s range and $13.2 for the 15 Mb/s range. The data for median price in OECD is $4.2. Some countries have a price starts from as low as 0.12$. The difference in price between the Arab region and OECD is therefore at least 1000% for the price for the 1 Mb/s. So, how the broadband price affects consumption? According to World Bank report[23], the monthly internet traffic in S Korea is 30 GB per capita. Cost of 1 Mb/s is $1. It seems that the prices are inversely proportional to consumption. There is no data available for the Arab region, but it is estimated that the average consumption is currently around 2GB. According to Cisco Visual Networking

Index (VNI) study the average broadband connection generates 14.9 GB of Internet traffic per month, up from 11.4 GB per month last year, an increase of 31 percent[24] . This will reach accordingly more than 50 GB per month in 2015. It is important to note that despite the mobile users are more than fixed line users, the mobile IP traffic is 1.2% in 2010 and will grow to 7.8% in 2015. Fixed is the main traffic generator. The same study shows that Consumers traffic will grow from 80.5% of traffic in 2010 to 87.1% of traffic by 2015. No data is available for the Arab region, but we estimated that the average traffic is 2 GB, based on the level of international bandwidth and current scheme of regional IXPs.

It is also noted that the Broadband commission has just set a target to have basic broadband prices to be less than 5% of income. The high prices of broadband results also in low penetration in the Arab region compared to Global penetration. Further analysis of reference [22] shows that the average price for the 1Mb/s is $168.4, this is to be compared with the average in OECD of 4.17 USD (PPP).

Use of domain names and internationalized domain names in Arabic is gaining ground, however it is still limited mainly because email applications are not yet adapted to handle non-Latin characters. Also mechanisms of registering domain names online and the associated hosting industries to be regional or national are not yet developed. It is important to look at the ecosystem guaranteeing customer needs in terms of mechanisms to effectively use the Internet in its daily life either for commercial or social purposes.

The use of mobile content is gaining ground, however we could not find studies across the region to indicate its usage patterns.

Development of Arabic Digital Content may benefit of the case of S. Korea. It is noted that it ranks no. 1 in terms of broadband usage, although it is ranked no. 85 in terms of international internet bandwidth per internet user. Also, it is noted that local firms dominate the content market, as exemplified by the search market. Here the top two companies; Naver (www.naver.com) and Daum (www.daum.net) are local, while the international market leaders – Google and Yahoo – have a combined market share of just 11.4 percent.[23] The main internet data is apparently produced and consumed within the country.

The Arab region needs to identify the mechanisms to achieve so. The Free Internet Initiative in Egypt (very successful before broadband) used a dial-up connectivity for numbers having a revenue sharing between Incumbent Operator, Telecom Egypt (having the backbone), ISPs promoting the service and the content provider on a more or less equal basis. This revenue share model might prove important to develop revenue for commercial content development in case of ADSL or Fiber connectivity. NGN technologies can used to trace content and therefore provide a revenue stream for its development. This mechanism implemented at the regional level with other micropayment schemes like PayPal is needed. It is also noted that Internet advertisement is gaining ground. Data revenue ranges around 20% of current telecom operators' revenue in developed markets and is expected to exceed voice revenue in the next few years. Development of regional policy to facilitate Internet traffic exchange and building the operational means of infrastructure for it like use of IXP (linked with the data centers), development of directories and search engines, and development of Arabic Digital content must run in parallel. Role of Government is Key for such development. [23]

Development of Arabic Digital Content should rely on three main schemes; a) digitization/digitalization of non- digital Arab content, b) translation of non-Arab Digital Content, and c) creation of new Arab Digital

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[23] Building broadband: Strategies and policies for the developing world, http://siteresources.worldbank.org/EXTINFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/Resources/282822-1208273252769/Building_broadband.pdf

[24] http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/VNI_Hyperconnectivity_WP.html

Content. The role of the Arab Governments in making this process of development from the policy, regulations and seed money is imperative. [23]

4. CHALLENGES AND OPPORTUNITIES

Examination of the landscape of Digital Content in the Arab region reveals that a lot of opportunities in developing digital content due to the following:

- The potential market for Arab Digital Content is huge given that it is far from its benchmarked levels.
- The young age of the population in the region.
- The interest of several governments to build on the dynamic of the situation to close the digital divide in the short run.
- The interest/preference of many users for local content in Arabic. Countries with special skills and experience in traditional media have the chance to build in these experiences and adopt the new digital media world.

The main challenges are related to:

- The lack of National & Regional Initiatives at the government, telecom operators, content providers levels. Most of the efforts are in terms of sporadic projects. The common market approach is not yet developed. Few Operators or Internet Service providers have a pan Arab Presence.
- The need to change in the mindset of regulators and government officials in investing in Content (a soft rather than a tangible asset).
- The multidisciplinary involvement of the eco-system of digital content and its interrelationship to ministries of telecommunication, culture, education, health, government administration, and others.
- Availability of skilled personnel: The lack of high-tech high- skill base that is required (at least presently) for the development of a digital content industry in the Arab world. The skills required for knowledge economies are not just limited to high-tech, but also in the areas of management, entrepreneurship and innovation. According to a survey carried out by the Nielson group for this report [11] made on the Arab media industry, "a staggering 98% of the Arab media professionals ...felt that talent availability is affecting the creation of quality local content. The issue of talent is one which is affecting all sectors of the Arab media industry."
- Availability of training and education: Most ICT and other related skills needed for the digital content industries are not obtained from formal degree courses of universities or tertiary institutions, but usually on the job or training program. Those who do not use ICT at work, or those who do not get trained (sufficiently) at work, face major challenges.
- Availability of skills on the side of users: Education and skills are also needed on the side of the user. The education system which would be a good source of basic digital competences to equip the younger generations faces challenge in the Arab region.

5. CONCLUSIONS AND RECOMMENDATIONS

Since the subject of digital content is proven to be the short run answer to Internet Adoption, which is considered to have a major impact on the socio-economic development and current analysis shows that digital content in the Arab region is much below the achievable targets in terms of economic and demographic analysis. Since, one of the great impediments is the language barrier, which should be a unifying much of the Arab region.

The main recommendations are:

- Develop *policies and strategies* for digital Arabic content development, with the aim of balancing and streamlining the operation between content and infrastructure, between supply and demand sides, between local and international content, between ISPs and content creators.
- Formation of *a Pan Arab Foundation for Digital Content* to monitor the situation, conduct studies, recommend solutions to governments, given the importance of looking at the Arab market a s a common market for digital Arabic content. This foundation may evolve into an operational arm of LAS, similar to Arabsat (http://www.arabsat.com) with hosting, IXPs, Content generation, etc…
- Immediate development of an *Arabic Search Engine, and Directory of Websites* classified by business in Arabic with an option of English and French.

- Invest *in creation and translation of content, especially digital content*. Use of automated tools of translation should significantly help. The existence of Wikimedia, should enable with the license. Sizing of the matter should be done in order to decrease the gap. (Translated material rate should exceed incoming growth). Innovative techniques are needed for this, crowd sourcing may help.
- Levies for Licensing of spectrum should be more directed to investment in the field, from capacity building to support of underserved (population and domains and digital content comes on the top of the list.
- The capacity building depends on the introduction of digital skills more widely to the general public and in particular to the educational institutes could constitute a basic level skill building of users. Using a definition from eNorway 2009, by the Ministry of Modernization [25]:

  > "Digital skills include the ability to exploit the opportunities offered by ICT, and use them critically and innovatively in education and work. Digital skills also include the ability to be critical to sources and assess content. Use of digital tools is a skill the individual must acquire, maintain and continually develop, if he or she is to be a digitally skilled and critical citizen".

  Building of capacity in education systems must start with skills development for teachers and school heads and accompanied by investment in R&D. Development of teaching resources must be directed at exploiting open standards, so that the market mechanisms for development of teaching aids are enabled to function as well as possible.

  For work force training particularly by smaller firms who may find extensive in-house training too costly if it covers a wide range of specialist skills, various OECD governments have aimed at developing more formal education and training programs for digital content. A study for the Irish government also recommends the development of digital media management courses, and creative components at the primary and secondary educational level and in the computer science programs. Other good practices in capacity building involves
- Support of Research institutions through special grants and award schemes for development of Arabic language processing software and tools with special focus on semantic web
- Launch of regional digital Arabic Content awards for individuals, business sector and government institutions
- Local/regional universities partner with external specialist institutes
- Individuals encouraged through awards and supported by mentoring /interning opportunities
- Encouraging innovation and the creation of start-up and SMEs working in digital content industry through the establishment of special fund and by encouraging FDI.
- Strengthening the link between academia, research institutes, incubators and professional association working in the field of Digital Arabic Content.
- Launching multi-stakeholder national initiatives and programs for Digital Arabic Content that focus on education, health and culture heritage preservation.
- Strengthening of regional forums/bodies for the exchange and sharing of information, incidences, good practices and experience.
- Support for the growth of innovative private business built on Arab content development and dissemination.
- Government initiatives to stimulate growth of talent, such as twofour54's tadreeb training academy, which is a long-term project, by an Arab government, to grow the Arab media talent pool and, in turn, promote the creation and exploitation of local content.

The above is needed to achieve the following goals and targets:

Goals	Targets
Increase percentage of Arabic Digital Content on the Internet sites. (There are several indices for measuring digital content, see Annex I)	**From current levels of (.2%-1.5) to (1%-3%) by 2015 and to (4%-5%) by 2020.**
Raising consumption levels of Digital content by the Arab user.	**To go from around 2 GB/month to 10 GB/month by 2015 and to 50 GB/month by 2020**
Lowering the cost to access digital content	**To go from $168 to connect for 1 Mb/s per month to around $15 by 2015 and to around $3 by 2020. All prices in PPP.**

[25] http://www.regjeringen.no/upload/FAD/Vedlegg/IKT-politikk/eNorway_2009.pdf

ANNEX I: A Proposed List of Digital Content Indicators

S.N.	Proposed List of Digital Content Indicators	Source
1	Proportion of Internet users by language, country level	WSIS proposed
2	Proportion of Internet users by language, top ten languages, global level	WSIS proposed
3	Proportion of web pages, by language	WSIS proposed
4	Number of domain name registrations for each country-code top-level domain, weighted by population	WSIS proposed
5	Number and share of Wikipedia articles by language	WSIS proposed
6	IP counts (Millions)	ARO_ITU
7	Internet Hosts (Millions)	ARO_ITU
8	Number of cctld in the top 1 M sites	ARO_ITU
9	Number of Internet Sites (in gtld)	ARO_ITU
10	Digital Content Used per capita, country, language Month (GB)	ARO_ITU
11	Cost of 1Mb/s per Month	ARO_ITU
12	Local Market Share of the Leading Search Engine	ARO_ITU
13	Number of Wikipedia articles per language per million speakers	ARO_ITU
14	Number of “country code top-level domains” per 1 000 residents per Economy	OECD
15	Number of Facebook subscribers per 1 000 residents per economy	OECD
16	Number of online newspapers per 1 million residents per economy	OECD
17	Number of streaming online radio stations per 1 million residents per Economy	OECD
18	Number of Flickr photos geotagged per 1 000 residents per economy.	OECD
19	Number of YouTube uploads per 1 000 residents per economy	OECD
20	Number of web pages per language	OECD
21	Number of Wikipedia articles per language	OECD
22	Number of Blogs per language	OECD
23	Number of tweets per language	OECD
24	Existence of a national initiative for promoting Digital Arabic Content (DAC) in a country	ESCWA
25	Existence of cyber legislation related to the copyright of digital content in a country	ESCWA
26	Existence of a registered Arabic ccTLD (country code Top Level Domain	ESCWA
27	Percentage of DAC to the total content available in all languages under the ccTLD	ESCWA
28	Number of registered national domain names per 1000 inhabitants	ESCWA
29	Percentage of Arabic websites visited of top 100 websites visited in a country	ESCWA
30	Percentage of DAC to the total content available in all languages on the Internet	ESCWA
31	Percentage of Arab Internet users of total Internet users	ESCWA
32	Number of Arabic search engines available on the Internet	ESCWA
33	Share of Arabic language used on social networking platforms (%).	ESCWA

ANNEX II: A List of Digital Content Indicators to Other ICT & Basic Indicators

Country/ Parameter	Mobile-cellular subscriptions (2010)	Fixed-telephone lines (2010)	GDP (PPP) in Billions of USD	Number of cctld in top 1 M	Interent Hosts	Internet Sites (gtld)	Internet users (Thousands) (2010)	Population (Thousands) (2010)	Land (Sq km)	Households (2010)	IP Counts	International Internet Bandwidth (Mbit/s) (2010)
ALGERIA	32,780,000	2,922,700	251.1	85	572	3,811	4,433.5	35,470	2,381,741	5,769,000	2,626,076	36,000
BAHRAIN	1,567,000	228,000	29.7	25	53,944	1,781	694.0	1,260	760	133,000	426,460	10,000
COMORES	165,000	21,000	0.8		14	3	37.5	730	2,235	199,000	12,584	166
DJIBOUTI	166,000	18,500	2.1	18	195	33	57.8	8906	23,200	144,000	17,360	837
EGYPT	70,661,000	9,618,000	497.8	166	187,197	39,667	21,691.8	81,120	1,001,450	18,590,000	8,516,363	142,964
IRAQ	24,000,000	1,600,000	113.4	34	9	2,198	791.8	31,670	438,317	3,748,000	216,933	80
JORDAN	6,620,000	485,500	34.53	50	42,412	5,791	2,351.1	6,190	89,342	1,165,000	610,863	15,000
KUWAIT	4,400,000	566,300	136.5	69	2,485	10,550	1,046.8	2,740	17,818	570,000	1,604,901	10,000
LEBANON	2,875,000	887,800	59.37	45	51,451	15,824	1,310.6	4,230	10,400	941,000	475,752	2,500
LIBYA	10'900'000	1,228,300	90.57	103	12,432	1,578	889.7	6,360	1,759,540	990,000	308,116	10,000
MOROCCO	31,982,000	3,749,400	151.4	11	277,793	17,595	15,656.2	31,950	446,550	578,000	3,395,473	75,000
MAURITANIA	2,745,000	71,6002	6.66	248	23	195	103.8	3,460	1,030,700	6,608,000	34,529	280
OMAN	4,606,000	281,800	75.84	55	9,114	4,637	1,725.1	2,780	309,500	444,000	379,733	10,537
PALESTINIAN A.	1,800,000	368,200	12.79	56	0	1,726	1,512.3	4,040	6,220	590,000	256	n/a
QATAR	2,329,000	298,100	150.6	57	822	1,380	1,435.2	1,760	11,586	138,000	657,235	24,502
SAUDI ARABIA	51,564,000	4,165,800	622	336	488,598	45,530	11,253.7	27,450	2,149,690	4,188,000	4,638,904	317,944
SOMALIA	648,000	100,000	5.9		3	23	105.8	9,330	637,657	1,539,000	14,350	n/a
SUDAN	17,654,000	374,700	100	23	70	608	4,207.8	43,550	1,861,484	6,645,000	288,566	13,300
SYRIA	11,799,000	4,069,000	107.4	52	8,114	9,669	4,2225.0	20,410	185,180	3,956,000	722,151	5,735
TUNISIA	11,114,000	1,289,600	100	95	490	6,967	3,857.0	10,4806	163,610	3,434,000	2,729,405	51,200
UAE	10,926,000	1,479,500	246.8	333	379,309	21,687	5,859.1	7,510	83,600	761,000	2,877,156	105,100
YEMEN	11,085,000	1,046,300	63.4	10	255	2,982	2,970.5	24'050	527,968	3,449,000	54,220	3,200
Total Arabic	312,386,000	35,514,502	2,859	1,871	1,515,302	194,235	86,213	365,446	13,138,548	64,579,000	30,607,386	834,345
Worldwide	5,385,659,000	1,189,262,000	74,533.10	1,000,000	764,007,596	120,232,717	2,044,151.90	6,895,100	136,437,677	1,751,590,810	3,463,670,272	59,119,709
Percentage of Arabic to Total	5.800%	2.986%	3.835%	0.187%	0.198%	0.162%	4.218%	5.300%	9.630%	3.687%	0.884%	1.411%

Sources: ITU.int, Alexa.com, Google.com, HosterStats.com, Webhosting.info, Netcraft.com, icann.org, domaintools.com, ripe.net and isc.org.

Note: This table should be further analyzed at the level of each country to determine if the general conclusions at the regional level stated in the report are valid. Further content indicators established at the International level may help to identify the quality of the network and other parameters which affects the demand side behavior and its degree of utilization. Cost of the service should be studied including the time of users due to low speed of connectivity, routing schemes, availability of data centers, infrastructure deployment and many other parameters which interact to determine the user level of satisfaction in addition to the availability of relevant content and its ease of use.

ANNEX III
2011 Telecommunications Retail Prices Benchmarking for Arab Region Compared to OECD , [22]

Service	OECD	Arab	Percentage Ratio
Fixed voice (PSTN) 20 Call Residential	24.32	21.47	88.28%
Fixed voice (PSTN) 60 Call Residential	35.1	45.11	128.52%
Fixed voice (PSTN) 140 Call Residential	55.96	84.57	151.13%
Fixed voice (PSTN) 420 Call Residential	89.15	152.85	171.45%
Fixed voice (PSTN) 100 Call Business	38.69	54.66	141.28%
Fixed voice (PSTN) 260 Call Residential	80.33	175.06	217.93%
mobile basket 30 calls per month	17.21	28.28	164.32%
mobile basket 100 calls per month	33.09	64.96	196.31%
mobile basket 300 calls per month	63.35	144.98	228.86%
mobile basket 900 calls per month	130.6	369.49	282.92%
mobile basket 400 messages /month	23.34	54.03	231.49%
64 kb/s leased line	N/A	594	N/A
256 kb/s leased line	N/A	1163	N/A
2 Mb/s leased line	1783	3259	182.78%
34 Mb/s leased line	9568	27778	290.32%
155 Mb/s leased line	N/A	24640	N/A
Residential Fixed Broadband > 256Kb/s	31.75	56.65	178.43%
Residential Fixed Broadband > 2.5 M	37.03	205.99	556.28%
Residential Fixed Broadband > 15 M	41.1	236.84	576.25%
Business Fixed Broadband > 256Kb/s	37.08	141.89	382.66%
Business Fixed Broadband > 2.5 M	43.31	959.53	2215.49%
Business Fixed Broadband > 15 M	61.38	1222.5	1991.69%
Residential broadband (2-8 Mb/s) mobile	15.77	35.19	223.15%
Residential broadband >8 Mb/s mobile	29.18	85.88	294.31%
Business broadband (2-8 Mb/s) mobile	15.46	95.42	617.21%
Business broadband >8 Mb/s mobile	27.89	90.73	325.31%

All prices are in USD (PPP).

Prices of the 1 Mb/s of Fixed Lines

256 Kb/s Service	Speed	Price	Price for 1 Mb/s
Djibouti	256	146.21	571.1
Syria	256	90.05	351.8
Lebanon	256	69.8	272.7
Mauritania	256	57.81	225.8
Libya	256	51.02	199.3
Sudan	256	50.72	198.1
Yemen	256	50.19	196.1
Palestine	512	91.07	177.9
UAE	256	31.79	124.2
Algeria	256	31.76	124.1
Jordan	512	59.51	116.2
Egypt	256	27.26	106.5
Saudi Arabia	256	25.46	99.5
Qatar	1000	77.41	77.4
Tunisia	512	38.24	74.7
Bahrain	640	40.34	63.0
Oman	2000	57.63	28.8
Morocco	1000	23.53	23.5
Average		56.7	168.4

Notes:

1. The first two columns were provided by [22], last column was calculated in order to compare the prices with those reported by OECD. [26]
2. Mobile prices are expected to be lower than those reported on fixed due to market forces.
3. Despite the higher level of subscribers for Mobile, the fixed IP traffic is much higher as reported in the report.

[26] Range of broadband prices per megabit per second of advertised speed, with/without line charge (Sept. 2010) http://www.oecd.org/dataoecd/22/43/39574979.xls