Arab Knowledge Economy Report 2014

Arab Knowledge Economy

2014

Content

Message From
Madar Research and Development

Once again, a global study has revealed an Arab deficiency on a major "knowledge" indicator. Of the top 500 universities in the world only five institutions are based in an Arab country. In its Academic Ranking of World Universities 2013 (ARWU), the Institute of Higher Education of the Shanghai Jiao Tong University (SJTU) rated four Saudi and one Egyptian Universities among the 150-500 of its top 500 research universities worldwide. Parameters for measuring the performance of a research university include the amount of research published in internationally recognized journals, the number of highly cited researchers, Nobel laureates and Field Medals winners among staff, and academic performance with respect to the size of the institution.

It is true that only 42 countries made the list – about one in every five world countries – and it may be seen as an achievement for the Arab world to have five universities on the list. However, when certain facts and factors are considered, this little achievement loses value. According to most international references, the Arab world is home to the world's oldest two universities. These are Al-Qarawiyyin University in Fez, Morocco and Al-Azhar University in Cairo, Egypt, which were founded in the ninth and tenth centuries AD, respectively – not to mention a recent archeological discovery that points to Roman-era Alexandria as the birthplace of the first university in the world. So, the Arabs have failed to build on a university tradition which exceeds a thousand years in Egypt and Morocco. This failure cannot all be blamed on decades or even centuries of political strife, wars and other hardships suffered under various occupations and political regimes; though there's no denying that these circumstances had their toll.

Meanwhile, Israel, which has always been a military state and at the heart of the Arab-Israeli conflict, has managed to make 7 entries in the top 500 university list, including three among the top 100. Regardless of all arguments, the great discrepancy between the Arab World and Israel boils down to the issue of setting priorities, followed by good planning and organization. It is worth mentioning that one Arab country, namely Saudi Arabia, has taken quite big strides towards building a culture of research and innovation. The Kingdom plays host to the largest number of research facilities in the region, prompting a fervent rise in the number of patents registered in the country - 170 in 2012 and 237 in 2013, according to the United States Patent and Trademark Office. Nevertheless, University-based research has never been a priority for most Arab governments – nor has any kind of research, for that matter.

While governments have consistently overlooked the important role university research can play in the economy, the academia itself in every Arab country has also failed to use their limited resources and create a showcase in a specific area to demonstrate their research capabilities and talents, which may subsequently attract international investors or at least draw financial support from local industries – if not government funds. Such a move in at least one university in each Arab country could lead to the creation of a small center of excellence for research, which in turn may act as a catalyst for a vibrant research culture at universities. Above all, the academia have failed to transform Arab universities from traditional teaching institutions to interactive and research-based learning environments.

The time has come for the region to resume its role as a champion of research and innovation.

Abdul Kader Al Kamli

Madar Research and Development CEO

Message From Orient Planet

The explosion of digital information that we have witnessed over the last few years has resulted in unprecedented levels of economic and social growth. This prompted many countries, especially the most progressive nations, to harness the full potential of information to thrive in today's age of digitally enabled knowledge. Governments across the globe are continuously undergoing major economic, social, and political transformations to support this shift to digital economy. Creating and promoting world-class digital knowledge and skills have become a vital part of their development agenda.

Arab countries have made significant progress in establishing a knowledge-based economy and society. With its wealth of natural and financial resources, huge investments in technology, and visionary leadership, the region is rapidly catching up with progressive countries in terms of digital innovations and expertise. Amidst these developments, we have decided to release the first ever Arab

Knowledge Economy Report as part of the unified effort to learn more about the Arab World's knowledge economies. This comprehensive report contains in-depth analyses and up-to-date information to aid the region in its efforts to achieve development.

The Kingdom of Saudi Arabia, the United Arab Emirates (UAE), Qatar, Morocco, Tunisia, and Jordan are some of the Arab states that have rolled out their respective initiatives and policies to encourage knowledge generation. Specifically, they have stepped up their efforts to enhance their education sector, improve their information and communications technology (ICT) infrastructure, create a favorable business environment, and strengthen their research and development programs.

In their quest to transform into a full-fledged knowledge economy, Arab countries face many challenges along the way. The report tackles the obstacles that are keeping the region from attaining its goals. The aim is to highlight the importance of having a unified approach in pushing for knowledge and innovation-based expansion. By taking a closer look at these milestones and challenges, the region will be able to gauge where it stands in terms of forming knowledge economies. From there, it can determine the vital and systematic steps that it must take in order to successfully move forward.

Our report is especially crucial to the assessment and development of the four major pillars of a knowledge economy: Education & Training; Information Infrastructure; Economic Incentive & Institutional Regime and Innovation Systems. In the following pages, you will find facts and figures that collectively create a blueprint for planning knowledge economies that are coherent, transparent, strategic, sustainable, and truly responsive to the needs of the Arab communities.

This report serves as a fundamental reference for government planners, policy makers, economists, and other stakeholders across the world as they put forth strategic agendas for smooth transition towards e-governance. The insights contained here could help Arab-based multinational corporations and international businesses create improved strategies to help them flourish in a knowledge-based economic model. Prospective investors from around the globe could also find this comprehensive study useful in determining where to bring their business next. The Arab Knowledge Economy Report empowers them as they make decisions that are crucial to achieving greater economic and social development.

Nidal Abou Zaki

Orient Planet
Managing Director

Introduction

In today's information age, many countries have been undertaking unprecedented measures to encourage knowledge creation and advanced technological development. The world is witnessing an inevitable trend of adopting knowledge economy as a key to attaining progress and productivity.

This knowledge-based economic growth represents itself as a unifying vision in the Arab World. Most Arab countries today are harnessing the power of high quality knowledge to remain competitive in the global economy of the 21st century. As stated in the recent World Bank report, investments in innovation and education are fundamental to achieve greater financial growth in the Middle East.

Arab countries have laid out relevant policies and goals and have taken significant steps to meet all requirements that define a knowledge economy. They have invested in a knowledge-based economic model to help create jobs and achieve more sustainable growth. All these efforts have yielded positive results and feedback. Since 2001, the Arab World has recorded the largest growth in Internet users as compared with other regions in the world. The number of citizens accessing the Internet in the region has soared by more than 600 per cent. Some nations have also rolled out initiatives to improve their education sector and Information and Communications Technology (ICT) infrastructure.

Although most of the Arab countries have accomplished significant progress, much still needs to be done. According to World Bank's report, only four Arab countries have ranked in the top 50 on the Knowledge Economy Index. The region continues to face many challenges in pursuit of its objective to transform into an information-based economy, which requires implementation of key cross-sectoral reforms in education, research and innovation, and ICT domains, among others.

One notable challenge is the lack of a coherent strategy among these developing economies to promote growth based on knowledge and innovation. Most Gulf States still rely on the exploitation of natural resources and on infrastructure development and financial markets. In addition, some Arab countries are still struggling to address their high unemployment rate. At 20 to 25 per cent, the unemployment rate in the region is twice the global average--even reaching 40 per cent in Egypt and Tunisia.

Nonetheless, the Arab region's potentials are immense. According to the United Nations Conference on Trade and Development, 52 per cent of the total US$1.3 trillion in global foreign direct investments went to developing countries in 2012. Emerging economies, including many Arab states, are expected to be bigger than G7 economies and the entire Organization for Economic Cooperation and Development (OECD) by 2060.

This report, the first of its kind, tackles all these information as it provides an in-depth look at the Arab knowledge economy. The data closely scrutinize the important components and characteristics, including strengths and weaknesses and opportunities and risks associated with it.

The statistics and other valuable information featured in the report could be an essential guide for government planners and economists as well as local, regional, and global business communities. It provides crucial assessment of the four major pillars of a knowledge economy, namely Education and Training, Information Infrastructure, Economic Incentive and Institutional Regime, and Innovation Systems. The report will be vital in efforts to acquire, create, disseminate, and use knowledge more effectively to achieve economic and social growth.

The report also gives particular focus on the UAE, which is at the forefront of implementing systematic changes across all sectors. Among the major steps undertaken by the government is its move to put the UAE Vision 2021 into operation; being able to harness the power of technology and full potential of its people. These two factors are integral parts of a knowledge economy.

The region is rapidly catching up with progressive countries in terms of digital innovations and knowledge creation. Arab economies can sustain this progress if their resources are fully utilized to improve the knowledge and skills of their population as well as enhance their research, innovation, and ICT proficiency.

Produced as a joint effort between Madar Research and Development and Orient Planet, this endeavor constitutes a small contribution to creating a research culture in the Arab World. Above all, it is part of both companies' contribution to the knowledge economy as research is recognized as one of its major pillars.

The number of Internet users in the Arab region is expected to increase to about 197 million by 2017.

1

Internet penetration is expected to jump from 32 per cent in 2012 to over 51 per cent in 2017.

2

The GCC countries comprise the 12th largest economic region in the world with a recorded Gross Domestic Product (GDP) growth rate of 4.03 per cent in 2013.

3

In the GCC region, the number of Internet users is forecasted to reach more than 40 million by the end of 2017.

4

GCC will witness a 67 per cent increased Internet penetration over the next three years.

5

Arab e-Performance Index 2013 – 2014 puts Bahrain on top at an average of 66.55 followed by UAE at 65.68.

6

Pan-Arab literacy rate within the age group of 15 and above has been averaged at nearly 77 per cent.

7

The UAE topped the Knowledge Economy Index (KEI) among Arab countries as it ranked 42nd globally with a score of 6.94.

8

In 2013, five Arab universities, including four from Saudi Arabia and one from Egypt, appeared on the Shanghai Academic Ranking of World Universities.

9

2013 GCC GDP and Population Growth

In 2013, Saudi Arabia ranked first in the GCC (and the Arab World) in terms of GDP with US$ 745.30 billion - largely dependent on its oil-based economy, which amounts to about 20 per cent of the world's oil reserves. Saudi Arabia is the only Arab country that is a member of the G20 (the economic forum consisting of 20 of the world's largest economies, including the European Union). Based on IMF figures, Saudi Arabia's GDP ranks its economy as the 19th largest in the world. The UAE ranks second in the Arab World with US$ 398.32 billion , followed by Qatar with US$ 201.55 billion .

The GCC dominates the Arab World in terms of GDP, registering US$ 1,640.83 billion in 2013. Based on IMF figures, this ranks the GCC as the 12th largest economy in the world. The GCC's GDP registered a healthy growth of 4.03 per cent in 2013.

GCC Countries by GDP (Nominal) 2012-2013				
Rank	Country	2012 (Billion US$)	2013 (Billion US$)	Growth
1	KSA	711.05	745.30	4.82%
2	UAE	383.79	398.32	3.78%
3	Qatar	192.40	201.55	4.75%
4	Kuwait	184.54	186.10	0.85%
5	Oman	78.29	81.40	3.97%
6	Bahrain	27.11	28.16	3.85%
Total GCC		1,577.19	1,640.83	4.03%

Source: IMF and MRD/Orient Planet

GCC GDP per Capita

GCC Countries by GDP Per Capita - 2013			
Arab Rank	Country	Population - Mid '13	US$
1	Qatar	1,916,426	105,169
2	Kuwait	3,937,358	47,265
3	UAE	9,249,994	43,061
4	KSA	29,994,272	24,848
5	Bahrain	1,281,332	21,977
6	Oman	3,855,206	21,114
Total GCC		50,234,588	32,663

Source: IMF, GCC official sources and MRD/Orient Planet

Qatar, with its population of 1.91 million (as of mid 2013), ranks as the richest country per capita in the GCC and the Arab World, with US$ 105,169 per capita in 2013. As per the IMF, this number makes Qatar the second wealthiest country in the world after Luxembourg. A study that MRD conducted in 2013, however, proved this ranking problematic. The population of Luxembourg stood at 570,000 in mid 2012, with GDP standing at US$ 56,738 billion and per capita GDP registering US$ 107,000. 125,400 (2012 estimate) workers, however, commute daily from France, Belgium, and Germany to Luxembourg.

If we add the 125,000 non-resident workers (since they contribute to the GDP) to the population of Luxembourg, then the per capita GDP drops to about US$ 87,000, making Qatar the first worldwide on the indicator.

Meanwhile, Kuwait ranked second in the GCC with US$ 47,265 per capita, followed by the UAE with US$ 43,061. Saudi Arabia, which topped the list of GCC GDP in 2013, ranked fourth with US$ 24,848 per capita.

GCC Population Growth

All countries in the GCC witnessed population growth over 2 per cent in 2013. Qatar, however, registered a massive population growth of 11.36 per cent, ranking first, followed by the UAE and Oman with 5 per cent and 4.95 per cent, respectively. The GCC as a whole registered a population growth of 3.68 per cent. In spite of the steady increase in population figures, the GCC's economy as a whole continues to grow, ranking as the 12th largest economy in the world.

Locals in the UAE and Qatar make up only 13 and 14 per cent of the population, respectively. The vast numbers of expatriates are driven by unskilled labor. The GCC was left mainly unaffected by the global economic crisis, and after undergoing a temporary stagnation witnessed an even bigger influx of foreigners looking for employment opportunities. The construction sector is still the largest contributor to the influx of unskilled labor in the GCC, especially in the UAE and Qatar.

## GCC Countries by Population - 2013

Rank	Country	End 2012	End 2013	Growth
1	QATAR	1,836,676	2,045,239	11.36%
2	UAE	9,036,488	9,488,312	5.00%
3	OMAN	3,770,473	3,957,040	4.95%
4	KUWAIT	3,823,728	3,954,728	3.43%
5	KSA	29,595,084	30,404,377	2.73%
6	BAHRAIN	1,193,825	1,217,701	2.00%
TOTAL GCC		**49,256,273**	**51,067,397**	**3.68%**

Source: Based on official sources and MRD/Orient Planet

GCC Population by Nationality - 2013

Country	Locals	Expatriates
UAE	13%	87%
QATAR	14%	86%
KUWAIT	30%	70%
BAHRAIN	49%	51%
OMAN	56%	44%
KSA	68%	32%

Source: Based on Official Figures
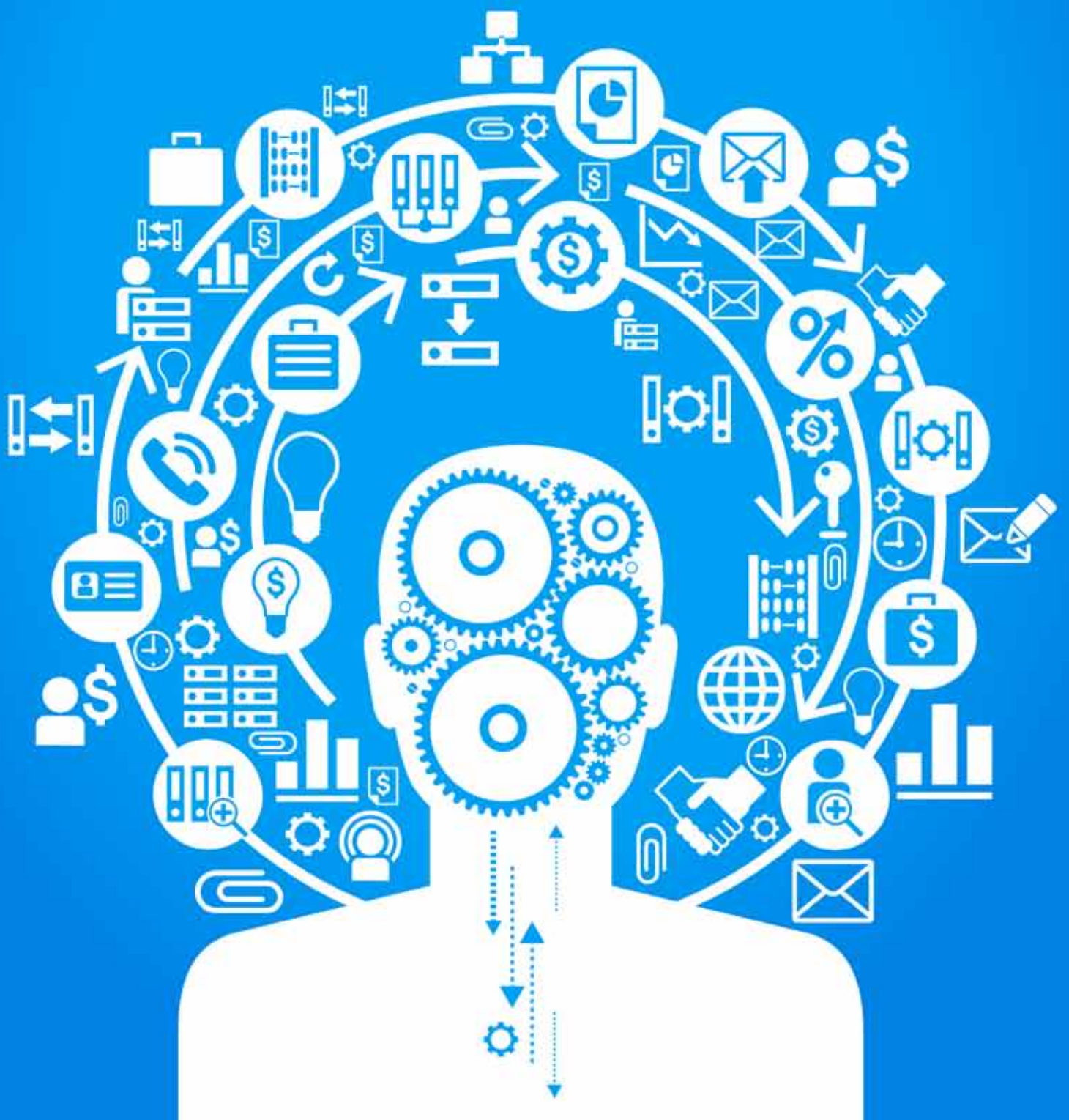
Arab Knowledge Economy Overview

Knowledge Economy Index (KEI) 2012		
Global Rank	Country	KEI
42	UAE	6.94
43	Bahrain	6.9
47	Oman	6.14
50	KSA	5.96
54	Qatar	5.84
64	Kuwait	5.33
75	Jordan	4.95
80	Tunisia	4.56
81	Lebanon	4.56
96	Algeria	3.79
97	Egypt	3.78
102	Morocco	3.61
112	Syria	2.77
122	Yemen	1.92
134	Mauritania	1.65
138	Sudan	1.48
139	Djibouti	1.34

Source: World Bank

The concept of a knowledge-based economy, or knowledge economy, has been widely discussed, analyzed, defined, and interpreted. Nevertheless, the catchy phrase heavily promoted by the IT industry remains vague or not fully understood by most people. One of the more simply phrased definitions comes from the World Bank, which describes the knowledge economy as "an economy that makes effective use of knowledge for its economic and social development. This includes tapping foreign knowledge as well as adapting and creating knowledge for its specific needs." While the Internet – along with its Information and Communication Technology (ICT) infrastructure and applications – lies at the heart of the knowledge economy as its enabling platform, nothing is new about the notion of employing knowledge and technology creatively and usefully to increase a country's productivity and bolster its economic competitiveness.

The fact is that the knowledge economy is but another stage in the global socio-economic evolution, almost similar in impact to the industrial revolution of the 19th century. However, unlike the industrial revolution whose birth is credited to a single invention – the steam engine – the knowledge economy concept is based on a group of old notions that found new life, wider applications and innovative solutions in the possibilities offered by the Internet and globalization.

What is new about the emerging era, however, is the wealth of readily-available, constantly updated data which both organizations and individuals can access, share, collaborate on, use and instantly communicate with one another over a global network. Online collaboration and knowledge exchange between researchers, business executives and professionals,

government officials, and individuals around the globe assist in effective problem solving and decision making and lead to the creation of new, useful and innovative ideas. These processes need a conducive environment and systematic support from various levels and entities like telecommunications, legislative bodies, policy makers, research institutions, academics, the private sector and community leaders, among others.

The World Bank and most economists agree that the knowledge economy rests on four major pillars, which are critical requisites for a country to be able to fully participate in the knowledge economy:

• Education & Training
• Information Infrastructure
• Economic Incentive & Institutional Regime
• Innovation Systems

Firstly, an educated and skilled population is needed to create, share and use knowledge. Secondly, a dynamic information infrastructure – ranging from radio to the Internet – is required to facilitate the effective communication, dissemination and processing of information. Thirdly, a regulatory and economic environment that enables the free flow of knowledge, supports investment in ICT, and encourages entrepreneurship is central to the knowledge economy. The fourth pillar or major requirement is a network of research centers, universities, think tanks, private enterprises and community groups, which are necessary to tap into the growing stock of global knowledge, assimilate and adapt it to local needs and create new knowledge.

In 2012, the UAE topped the Knowledge Economy Index (KEI) among Arab countries, while ranking 42nd worldwide. The country achieved a score of 6.94. Bahrain and Oman ranked second and third on the index, scoring 6.9 and 6.14 points, respectively. Saudi Arabia ranked fourth in the region and 50th

worldwide on the knowledge economy index, advancing 26 places from its position in 2000. Saudi Arabia has achieved incredible progress in migrating towards a knowledge economy and ranked first worldwide on the index in terms of progress made since 2000, compared with 146 countries covered in the report. Qatar rounded up the top five with a score of 5.84, ranking 54th worldwide.

"A knowledge economy makes effective use of knowledge for its economic and social development. This includes tapping foreign knowledge as well as adapting and creating knowledge for its specific needs."

World Bank

Knowledge Economy Indicators

The knowledge economy composite index can be calculated by using all or some of the numerous individual indicators described in the Appendix III, or by using the 12 individual indicators (three indicators for each of the four pillar indicators), called by the World Bank 'Basic Scorecards' or core indicators. In order to simplify comparisons among different countries around the world, the World Bank chose the basic scorecard to calculate the index of each pillar indicator and then the knowledge economy index. The following table shows the 12 basic indicators.

It is evident that the 2012 indicators are in fact based on data three or four years old. Once we realize that some Arab countries (mainly GCC) are progressing very quickly in their migration towards a knowledge economy, we can safely assume that their current rankings are much higher than reported by the World Bank. The report notes, for example, that in

Saudi Arabia the average number of patents per million inhabitants granted by the United States Patents and Trademarks Office (USPTO) from 2005 to 2009 is 0.92 patent. If we take the most current average recorded from 2008 to 2012, however, the figure registered (2.4) is more than 2.6 times greater than the figure used by the report, which would raise the Kingdom's rank on the innovation pillar dramatically.

"Innovation is the central issue in economic prosperity."

Michael Porter

Global Ranks of Arab Countries on each Pillar of KEI											
Economic Incentive Regime			**Innovation**			**Education**			**ICT**		
Rank	Country	Score	Rank	Country	Score	Rank	Country	Score	Rank	Country	Score
44	OMAN	6.96	46	UAE	6.6	45	BAHRAIN	6.78	1	BAHRAIN	9.54
45	QATAR	6.87	49	QATAR	6.42	55	UAE	5.8	12	UAE	8.88
48	BAHRAIN	6.69	57	OMAN	5.88	58	KSA	5.65	21	KSA	8.37
50	UAE	6.5	64	KUWAIT	5.22	63	JORDAN	5.55	51	QATAR	6.65
54	KUWAIT	5.86	70	TUNISIA	4.97	64	LEBANON	5.51	54	KUWAIT	6.53
60	KSA	5.68	71	LEBANON	4.86	71	ALGERIA	5.27	55	OMAN	6.49
62	JORDAN	5.65	75	BAHRAIN	4.61	74	OMAN	5.23	79	TUNISIA	4.89
72	MOROCCO	4.66	84	KSA	4.14	89	TUNISIA	4.55	87	JORDAN	4.54
73	EGYPT	4.5	85	EGYPT	4.11	98	KUWAIT	3.7	89	ALGERIA	4.04
79	LEBANON	4.28	88	JORDAN	4.05	101	QATAR	3.41	90	MOROCCO	4.02
96	TUNISIA	3.81	96	MOROCCO	3.67	102	EGYPT	3.37	99	LEBANON	3.58
107	YEMEN	2.91	99	ALGERIA	3.54	109	SYRIA	2.4	100	SYRIA	3.55
115	ALGERIA	2.33	107	SYRIA	3.07	115	MOROCCO	2.07	105	SUDAN	3.16

Source: IMF and MRD/Orient Planet

Patents Issued to Arab Countries

The virtual absence of a culture conducive to innovation and supportive of the spirit of research and invention in the Arab World could not be more evident than through a rundown of the number of patents issued to the region. Since its inception, a total of only 1,818 patents were granted by the United States Patent and Trademark Office (USPTO) to residents of Arab countries. To put this number into context, the number of patents granted by the USPTO in 2013 alone reached 277,835 patents.

Saudi Arabia was the clear winner of the Arab patent race, registering 237 granted patents in 2013 and 858 in all documented years. Kuwait came in at a distant second with 84 patents in 2013 and 272 in all years, while Egypt ranked third with 34 patents in 2013 and 212 in all years.

Utility Patents by Country and Year

Country	Pre '03	'03	'04	'05	'06	'07	'08	'09	'10	'11	'12	'13	All Years
KSA	189	19	15	18	19	20	30	22	58	61	170	237	858
Kuwait	61	7	4	3	7	6	15	15	14	24	32	84	272
Egypt	78	6	4	7	4	12	2	3	16	21	25	34	212
UAE	30	2	2	3	8	2	9	9	7	10	20	18	120
Lebanon	55	5	1	1	2	4	2	3	4	9	8	7	101
Morocco	59	1	1	1	3	1	4	1	1	3	2	1	78
Tunisia	17	0	1	1	2	0	2	0	2	3	5	4	37
Jordan	16	1	1	0	1	2	0	1	0	5	3	6	36
Syria	15	0	1	0	3	1	0	0	0	1	1	0	22
Qatar	1	0	0	0	2	0	1	2	0	1	4	7	18
Oman	1	0	0	1	0	0	5	1	1	3	3	3	18
Algeria	11	0	1	0	1	0	0	0	1	0	0	0	14
Iraq	9	0	0	0	0	0	1	0	0	0	0	0	10
Bahrain	4	0	0	0	0	0	0	0	1	0	1	2	8
Sudan	7	0	0	0	0	0	0	0	0	0	0	0	7
Libya	4	0	0	0	0	0	0	0	0	0	0	0	4
Yemen	3	0	0	0	0	0	0	0	0	0	0	0	3
Total	560	41	31	35	52	48	71	57	105	141	274	403	1,818

Source: USPTO

The figures become even more significant when considered in the context of the number of patents issued per one million of a country's population. In 2013, Kuwait found itself first on the indicator with 21.24 patents per million, while Saudi Arabia ranked second with 7.79 patents per million. The UAE placed third with 1.90 patents per million. Six Arab countries shared the last place, having been granted no patents at all and scoring zero on the indicator, namely Syria, Algeria, Iraq, Sudan, Libya and Yemen.

Utility Patents by Country per Million/Population - 2013

Country	'13 Patents	'13 Population	'13 Patents Per mill/POP
Kuwait	84	3,954,728	21.24
KSA	237	30,404,377	7.79
UAE	18	9,488,312	1.90
Qatar	7	2,045,239	3.42
Lebanon	7	4,501,252	1.56
Bahrain	2	1,217,701	1.64
Oman	3	3,957,040	0.76
Jordan	6	6,530,194	0.92
Tunisia	4	10,979,069	0.36
Egypt	34	85,706,389	0.40
Morocco	1	33,128,411	0.03
Syria	0	19,200,000	0.00
Algeria	0	38,700,000	0.00
Iraq	0	35,475,181	0.00
Sudan	0	36,735,416	0.00
Libya	0	6,237,000	0.00
Yemen	0	25,599,219	0.00
TOTAL	403	353,859,528	1.14

Source: USPTO

Kuwait also registered the highest growth in patents between 2012 and 2013, with a whopping 162.50 per cent. Bahrain and Jordan tied in second place with 100 per cent, while Qatar came in third with 75 per cent growth. Saudi Arabia ranked fourth in the Arab World, registering 39.41 per cent and Egypt rounded up the top five with 36 per cent growth.

Utility Patents Growth by Country - 2013

Country	'12 Patents	'13 Patents	Growth
Kuwait	32	84	162.50%
Bahrain	1	2	100%
Jordan	3	6	100%
Qatar	4	7	75%
KSA	170	237	39.41%
Egypt	25	34	36%
UAE	20	18	-10%
Lebanon	8	7	-12.50%
Tunisia	5	4	-20%
Morocco	2	1	-50%
Syria	1	0	-100%
Oman	3	3	0
Algeria	0	0	0
0raq	0	0	0
Sudan	0	0	0
Libya	0	0	0
Yemen	0	0	0
TOTAL	274	403	47.08%

Source: USPTO

On a global scale, the Kingdom held a convincing 29th place for patents granted in 2013, up from 30th place in 2012 and far ahead regional powers Iran and Turkey. The US ranked first with a whopping 133,593 patents, while Japan and Germany held the second and third place with 51,919 and 15,498 granted patents, respectively.

"Natural resources have dropped out of the competitive equation. In fact, a lack of natural resources may even be an advantage … because the industries we are competing for – the industries of the future – are all based on brainpower."

Lester Thurow

Number of Utility Patents Granted - 2013

Rank	Country	Patents
1	U.S.A.	133,593
2	Japan	51,919
3	Germany	15,498
4	South Korea	14,548
5	Taiwan	11,071
6	Canada	6,547
7	France	6,083
8	China	5,928
9	U.K.	5,806
10	Israel	3,012
11	Italy	2,499
12	India	2,424
13	Sweden	2,271
14	Switzerland	2,270
15	Netherlands	2,253
16	Australia	1,631
17	Finland	1,221
18	Belgium	1,062
19	Austria	1,008
20	Denmark	921
21	Singapore	797
22	Spain	711
23	Hong Kong	540
24	Norway	475
25	Ireland	431
26	Russia	417
27	Brazil	254
28	New Zealand	247
29	Saudi Arabia	237
30	Malaysia	214
	Others	1,947
TOTAL		**277,835**

Source: USPTO

2013-2014
Arab e-Performance Index

Madar Research and Development and Orient Planet have created a new Index based on the six most important global indexes:

1- GCI: Global Competitiveness Index (GCI) - WEF: Global Competitiveness Report 2012-2013
2- NRI: Network Readiness Index - INSEAD & WEF: Global Information Technology Report 2012
3- IDI: ICT Development Index: ITU - Measuring the Information Society 2013
4- GII: Global Innovation Index - INSEAD & WIPO: Global Innovation Index 2013
5- KEI: Knowledge Economy Index - World Bank 2012
6- E-gov. development index: UN e-Government Survey 2012

Arab e-Performance Index - 2013-2014

Rank	Country	GCI	NRI	IDI	GII	KEI	E-Gov	Average
1	UAE	72.86	72.43	64.1	41.87	69.4	73.44	65.68
2	Qatar	77.14	72.86	65.4	41	58.4	64.05	63.14
3	Bahrain	65.71	69	63	36.13	69	69.46	62.05
4	KSA	74.29	68.86	56.9	41.21	59.6	66.58	61.24
5	Oman	67.14	64	53.6	33.25	61.4	59.44	56.47
6	Kuwait	65.71	56.29	50	40.02	53.3	59.6	54.15
7	Jordan	60.43	60	42.2	37.3	49.5	48.84	49.71
8	Lebanon	55.71	50.437	53.7	35.47	45.6	51.39	48.72
9	Tunisia	63.86	58.86	37	35.82	45.6	48.33	48.24
10	Egypt	52.86	54	38.5	28.48	37.8	46.11	42.96
11	Morocco	58.57	52	37.9	30.89	36.1	42.09	42.93
12	Algeria	52.857	39.71	30.7	23.11	37.9	36.08	36.73
13	Syria	55	40.71	32.2	23.73	27.7	37.05	36.07
14	Yemen	42.86	37.57	18.9	19.32	19.2	24.72	27.09

Source: MRD and Orient Planet

Bahrain ranked first with an average of 66.55. The country had achieved impressive scores on almost all indicators, but especially well on the KEI indicator, achieving 96 points. The UAE came in second hot on the heels of Bahrain with an average score of 65.68. The UAE had outperformed Bahrain on almost all indicators, but Bahrain's almost perfect score on the KEI thwarted the UAE's advances to first place. The GCC rounded up the top five, with Qatar (63.14), Saudi Arabia (61.24), Oman (56.47) and Kuwait (54.15) placing in third, fourth, fifth and sixth place, respectively.

On the other end of the scale, Yemen achieved the lowest score with an average of 27.09, preceded by Syria with 36.07. Algeria faired quite poorly as well, failing to reach beyond 40 points and instead scoring 36.73. The link between better scores and countries with advanced telecommunication infrastructure is evident.

> " Knowledge has become what we buy, sell, and do. It is the most important factor of production. "
>
> **Thomas Stewart**

The Arab ICT Use Index

Bahrain topped the 2013 index with a score of 3.08. Bahrain was among the top five in all of the ICT sectors. Bahrain's position was mostly driven by its Internet users figure, 65.66 per cent, ranking it first in the MENA region. Bahrain came in second place for mobile penetration, while placing third for fixed line penetration and computer installed base.

Coming in second place, Qatar scored an overall 2.96 on the 2013 Arab ICT Use Index, moving from first place (joined with Saudi Arabia) and a score of 2.78 in 2012. Qatar now has the highest computer installed base in the MENA region with 54.21 per cent penetration, the third highest mobile penetration rate at 169.66 per cent, and the fourth highest Internet user rate of 54.93 per cent. Fixed line

penetration registered 17.62 per cent, landing the country in fifth place.

In terms of growth on the ICT Use Index, Bahrain ranked first with 15.95 per cent growth, followed by Jordan and Kuwait in second and third place, with 15.88 per cent and 13.09 per cent growth, respectively. On the lower end of the scale, Oman ranked last with the only negative growth rate on the list, registering -0.22 per cent. Oman's negative growth can be attributed to the country's high population growth, as the influx of expatriates, many of them unskilled workers, is rapidly reaching numbers higher than those registered on other indicators, such as mobile subscriptions and Internet users.

ICT Use Index Growth - 2012 - 2013				
Rank 2013 ('12)	Country	2013 Index	2012 Index	Growth
1 (3)	BAHRAIN	3.08	2.65	15.95 %
7 (8)	JORDAN	2.08	1.79	15.88 %
5 (5)	KUWAIT	2.67	2.3 6	13.09 %
12 (12)	EGYPT	1.65	1.47	12. 46%
15 (15)	SYRIA	1.27	1.13	12.30 %
16 (16)	IRAQ	1.14	1.0 2	11.80 %
18 (18)	YEMEN	0.81	0.7 3	10.94 %
3 (4)	UAE	2.84	2.59	10.26 %
11 (11)	LEBANON	1.72	1.57	10.06 %
17 (17)	SUDAN	1.08	0.98	9.94 %
9 (10)	MOROCCO	1.89	1.73	8.70 %
14 (14)	PALESTINE	1.29	1.1 9	8.61 %
10 (9)	TUNISIA	1.86	1.74	7.22 %
2 (1)	QATAR	2.96	2.78	6.49 %
13 (13)	ALGERIA	1.42	1.33	6.52 %
6 (6)	LIBYA	2.21	2.10	5.41 %
4 (1)	KSA	2.82	2.78	1.30 %
8 (7)	OMAN	2.019	2.023	-0.22 %
Average		1.64	1.50	9.07%

Source: MRD and Orient Planet

" Creativity is thinking up new things. Innovation is doing new things. **"**

Theodore Levitt

Arab Internet Population Overview

The total number of Internet users in the 18 Arab economies under study has been rising quickly. Internet users in the 18 Arab countries numbered 111,721,020 in 2012, rising at a rate of 18.98 per cent over the 2011 figure of 93,896,216. The most recent and highest growth rates are taking place in emerging markets with high population and relatively low penetration rates.

Internet user growth is being driven by steady progress shown in traditionally low-penetrated countries, such as Tunisia, Yemen and Sudan. There is, however, a considerable gap between countries when it comes to penetration, with Bahrain at the high end and Yemen at the low end. Tunisia registered the strongest growth in Internet users in 2012, 31.53 per cent, for a total of 4,515,544 users. An increase in youth unemployment rates and the rise of social media may have contributed to Tunisia's evolving growth rates.

Internet Users, Distribution and Growth in Middle East and North Africa 2012-2017

Country	2012 Population	2012 Internet Users	Penetration (end 2012)	% of Sub-Total	2011 Internet Users	2011-12 Growth	CAGR, 2012-17	2017 Internet Users
Gulf Co-operation Council Countries								
Bahrain	1,217,701	799,521	65.66%	3.03%	715,928	11.68%	8%	1,174,759
Qatar	1,836,676	1,008,850	54.93%	3.82%	854,958	18.00%	12%	1,777,938
UAE	9,036,488	5,169,280	57.20%	19.58%	4,574,578	13.00%	10%	8,325,177
KSA	29,595,084	15,800,000	53.39%	59.85%	13,600,000	16.18%	8%	23,215,384
Kuwait	3,823,728	2,268,470	59.33%	8.59%	1,853,394	22.40%	8%	3,333,127
Oman	3,770,473	1,353,318	35.89%	5.13%	1,146,880	18.00%	12%	2,385,009
Sub Total	49,280,150	26,399,439	53.57%	100.00%	22,745,738	16.06%	8.53%	40,211,394
Levant								
Jordan	6,388,000	2,603,148	40.75%	5.98%	2,187,519	19.00%	10%	4,192,396
Lebanon	4,447,877	2,007,860	45.14%	4.61%	1,730,914	16.00%	10%	3,233,679
Egypt	83,661,000	26,256,732	31.38%	60.29%	21,671,400	21.16%	12%	46,273,333
Palestine	4,356,931	1,332,540	30.58%	3.06%	1,140,172	16.87%	15%	2,680,214
Syria	19,200,000	5,011,474	26.10%	11.51%	5,113,749	-2.00%	14%	9,649,165
Iraq	34,576,200	6,337,139	18.33%	14.55%	5,510,556	15.00%	16%	13,310,157
SubTotal	152,630,008	43,548,893	28.53%	100.00%	37,354,310	16.58%	12.10%	79,338,944
North Africa								
Libya	6,100,000	1,355,000	22.21%	4.55%	1,180,000	14.83%	16%	2,845,963
Morocco	32,773,500	15,543,226	47.43%	52.17%	12,728,464	22.11%	10%	25,032,521
Tunisia	10,869,143	4,515,544	41.54%	15.16%	3,432,988	31.53%	12%	7,957,931
Algeria	37,900,000	8,378,522	22.11%	28.12%	6,867,641	22.00%	18%	19,168,029
SubTotal	87,642,643	29,792,292	33.99%	100.00%	24,209,093	23.06%	11.62%	55,004,444
Other Arab								
Sudan	35,609,658	7,824,396	21.97%	65.31%	6,259,517	25.00%	13%	14,415,942
Yemen	24,881,000	4,156,000	16.70%	34.69%	3,327,558	24.90%	15%	8,359,200
SubTotal	60,490,658	11,980,396	19.81%	100.00%	9,587,075	24.96%	12.66%	22,775,142
Total	350,043,459	111,721,020	31.92%	100.00%	93,896,216	18.98%	11.23%	197,329,924

Source: Arab Ministries of Planning, Telecommunications companies/ISPs and MRD/Orient Planet

" The best way to predict the future is to invent it.**"**

Alan Kay, American computer scientist

Arab Internet Population Forecast (2012-2017)

The number of Internet users in the Arab World is expected to rise to about 197 million users by 2017. The Internet penetration rate will jump from about 32 per cent in 2012 to over 51 per cent in 2017, which would be about 3 per cent above the world average at that time, as the number of Internet users is forecast to reach 3.6 billion according to Cisco.

Internet Users By End 2017

Country	Population End 2017	Internet Users End 2017	Penetration
Bahrain	1,344,438	1,174,759	87.38%
UAE	11,533,103	8,325,177	72.19%
KSA	33,993,934	23,215,384	68.29%
Qatar	2,642,812	1,777,938	67.27%
Kuwait	4,523,798	3,333,127	73.68%
Oman	4,587,357	2,385,009	51.99%
Total GCC	60,175,161	40,211,394	66.82%
Egypt	95,973,133	46,273,333	48.21%
Iraq	39,310,998	13,310,157	33.86%
Syria	20,179,393	9,649,165	47.82%
Jordan	7,130,776	4,192,396	58.79%
Lebanon	4,674,761	3,233,679	69.17%
Palestine	5,044,572	2,680,214	53.13%
Total Levant	159,163,109	79,338,944	49.85%
Morocco	34,594,329	25,032,521	72.36%
Algeria	42,166,321	19,168,029	45.46%
Tunisia	11,565,661	7,957,931	68.81%
Libya	6,625,563	2,845,963	42.95%
Total North Africa	94,917,727	55,004,444	57.95%
Sudan	41,622,850	14,415,942	34.63%
Yemen	28,702,882	8,359,200	29.12%
Total Sudan & Yemen	70,323,970	22,775,142	32.39%
Total (18 Arab Countries)	383,796,441	197,329,924	51.42%

Source: MRD and Orient Planet

Adult Literacy Remains Major Hurdle for Arab Knowledge Economy Development

Adult illiteracy remains high in some Arab countries, and it is posing a more serious threat than ever, due to its detrimental effect on the development of an Arab information society and a knowledge-based economy. The worst part is that progress in eradicating illiteracy in Arab countries has generally been slow, with the gap in adult illiteracy with the developed world and other developing regions widening.

Pan-Arab literacy rate within the age group of 15 and above has been averaged at nearly 77 per cent in 2011, according to United Nations estimates. Only six countries displayed literacy rate of 90 per cent and above for the period. The worst cases are Yemen (65.1 per cent literacy) and Morocco (67.1 per cent). Qatar, on the other hand, has the best Arab literacy rate (96.3 per cent) followed by Jordan (95.9 per cent).

Unfortunately, the UN figures for GCC cannot be accepted unless they only covered the local population. When looking at the UAE, for example, it is difficult to accept that a country with 25 per cent of its population residing in labor camps or group quarters (most of them illiterates) can register an Adult literacy figure of 90 per cent, as reported by UNESCO Institute for Statistics.

Similarly, Qatar's literacy rate of 96.3 per cent is unfathomable when compared to the percentage of unskilled workers residing in labor camps, which comes in at a whopping 54 per cent. Moreover, official data indicates that 32.45 per cent of these workers have not completed elementary education.

Since adult illiteracy eradication programs, especially in rural areas, focus more on reaching the youth – while the rate at which people shun literacy programs is higher among older generations – literacy among people aged between 15 and 24 has been much higher than it is among the group aged 15 and above. In Yemen, for example, literacy rate jumps from 65.3 per cent for the whole adult population to 86.4 per cent for those between 15 and 24 years. In Morocco the rate surges from 67.1 per cent to almost 81.5 per cent.

The more important observation to highlight due to its socio-economic implications is the discrepancy between male and female literacy in many Arab countries, which favor males. Data reveals that female literacy rates were lower than male literacy rates (male rate of 85 per cent vs. female rate of 68 per cent).

> " The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn. "
>
> *Alvin Toffler*

Adult Literacy (15+) by Country - Latest Available Year

Country	Year	Literacy Rate[1]
QATAR	2010	96.3%
PALESTINE	2011	95.3%
OMAN	2010	86.9%
JORDAN	2011	95.9%
BAHRAIN	2010	94.6%
UAE	2005	90.0%
LEBANON	2007	89.6%
LIBYA	2011	89.5%
KUWAIT	2008	93.9%
KSA	2011	87.2%
SYRIA	2011	84.1%
IRAQ	2011	78.5%
TUNISIA	2010	79.1%
ALGERIA	2006	72.6%
EGYPT	2012	73.9%
YEMEN	2011	65.3%
MOROCCO	2011	67.1%

Source : UNESCO Institute for Statistics (Adult and Youth Literacy Report-June 2013)

ICT Price Basket as a Percentage of the Monthly Minimum Wage

The ICT Price Basket is a composite basket that includes the following three tariff sets: fixed telephone, mobile cellular and fixed broadband Internet services. According to ITU: "The ICT Price Basket allows policy makers to compare the cost of

ICT services across countries, and provides a starting point for looking into ways of lowering prices – for example, by introducing or strengthening competition, by reviewing specific tariff policies and by evaluating operators' revenues and efficiency."

ICT Price Basket methodology (GNI-based)
Fixed telephone
Monthly subscription + 30 local calls (15 peak and 15 off-peak calls) of three minutes each
Divided by
National average monthly GNI per capita
+
Mobile cellular
30 outgoing calls (on-net, off-net and to a fixed line, and for peak, off-peak, and weekend periods) in predetermined ratios + 100 SMS messages (50 on-net + 50 off-net)
Divided by
National average monthly GNI per capita
+
Fixed broadband Internet
Monthly subscription to an entry broadband plan (based on 1 Gigabyte of download volume)
Divided by
National average monthly GNI per capita
÷ 3 × 100
=
ICT Price Basket (GNI-based)

ICT Price Basket Methodology (Minimum Wage-based)
Fixed telephone
Monthly subscription + 30 local calls (15 peak and 15 off-peak calls) of three minutes each
Divided by
Monthly minimum wage
+
Mobile cellular
30 outgoing calls (on-net, off-net and to a fixed line, and for peak, off-peak, and weekend periods) in predetermined ratios + 100 SMS messages (50 on-net + 50 off-net)
Divided by
Monthly minimum wage
+
Fixed broadband Internet
Monthly subscription to an entry broadband plan (based on 1 Gigabyte of download volume)
Divided by
Monthly minimum wage
÷ 3 × 100
=
ICT Price Basket (Minimum Wage-based)

While the ITU ICT price index is useful in identifying an ICT price basket as a percentage of average monthly income of a country's citizens, it does not give a perspective on what the price means for the less economically fortunate members of the society – the minimum-wage earners, which usually constitute a good portion of any community. As the

Internet in our days is becoming a necessity for all members of a society, the lowest economical slice should be taken as a reference for the index.

We recommend the creation of an index which complements the ITU "ICT Price Basket as a percentage of monthly GNI per capita," by providing

an additionally useful information for policy makers. ITU's GNI data was collected from the World Bank, 2011.

We propose an "entry-level" form of the index be introduced as: ICT Price Basket as a percentage of the monthly minimum wage.

The above table provides full details about the calculation of this index.

The minimum wage-based index would add value to the GNI-based index, especially in underdeveloped and developing countries where ICT prices are often the biggest hindrance to the universal adoption of basic.

ICT Price Basket (GNI-based) Vs. (Minimum Wage-based) In Arab Countries - 2012

Global Rank IPB/GNI p.c.	Country	GNI Per Capita $	Monthly GNI P.C.	ICT PB / Monthly GNI p.c.)	Minimum Wage $ Monthly	ICT Price Basket/ Minimum Wage
2	Qatar	80,440	6,703	0.4	219[1]	12.2
7	UAE	40,760	3,397	0.5	110[2]	15.4
24	Oman	19,260	1,605	1	156[3]	10.3
34	Bahrain	15,920	1,327	1.2	400	4.0
50	KSA	17,820	1,485	1.5	400[4]	5.6
60	Lebanon	9,110	759	2.1	449	3.6
64	Tunisia	4,070	339	2.3	172	4.5
70	Egypt	2,600	217	2.6	102[5]	5.6
84	Algeria	4,470	373	3.1	223	5.2
87	Jordan	4,380	365	3.3	268	4.5
106	Morocco	2,970	248	5.1	188	6.7
113	Sudan	1,300	108	6.2	60[6]	11.2
122	Yemen	1,070	89	10	N/A	N/A
129	Djibouti	1,270	106	16.3	N/A	N/A
-	Kuwait	48,900	4,075	N/A	212	N/A
-	Libya	12,320	1,027	N/A	358	N/A
-	Syria	2,750	229	N/A	87	N/A
-	Iraq	2,640	220	N/A	113	N/A

Source: ITU for ICT Price Basket / GNI p.c.)
* Monthly minimum wage for UAE, KSA, Bahrain, Lebanon, Tunisia, Egypt, Algeria, Jordan, Morocco, Sudan, Syria, Iraq, Kuwait, Libya was obtained from the Country Reports on Human Rights Practices for 2012 (www.state.gov)

[1] There are 340,679 Nepalis in Qatar, according to figures distributed in a news conference held in September 2013, attributed to the Nepali Embassy. Most of them work in construction in the wealthy country that is preparing to host the 2022 soccer World Cup. The minimum wage of Nepali workers is QR800 ($219) a month, which includes a QR200 allotment for food and expenses. Source: www.dohanews.co

[2] Average salaries in UAE depended on the occupation and employer, were estimated at around 400 dirhams (approximately $110) per month for domestic or agricultural workers and 600 dirhams ($164) per month for construction workers.Source: http://www.state.gov

[3] Oman minimum wage is an estimation based on the actual salaries of the unskilled workers in construction and housekeeping sectors

[4] In 2011, the Saudi Arabia government agreed to enforce a minimum wage of 1,500 riyals ($400 per month) and committed to prevent contract substitution and the seizure of workers' passports. Source: http://www.state.gov

[5] The new government decided to raise the minimum monthly salaries of all state employees from 700 Egyptian pounds ($102) to 1,200 pounds ($174) as of January 1, 2014. Source: http://www.aljazeera.com

[6] The minimum wage in Sudan set by the High Council of Salary in the Ministry of Cabinet Affairs is 265 Sudanese pounds (approximately $60) per month for the public sector. The minimum salary in the private sector is set by agreement between individual industries and the High Council of Salary, and it varies among industries. Source: http://www.state.gov

Arab Countries In Terms Of ICT Price Basket (GNI-based) 2012

Rank	Country	ICT Price Basket / Monthly GNI p.c.
1	Qatar	0.4
2	UAE	0.5
3	Oman	1.0
4	Bahrain	1.2
5	KSA	1.5
6	Lebanon	2.1
7	Tunisia	2.3
8	Egypt	2.6
9	Algeria	3.1
10	Jordan	3.3
11	Morocco	5.1
12	Sudan	6.2

Source: MRD and Orient Planet

Arab Countries In Terms Of ICT Price Basket (Minimum Wage-based) - 2012

Rank	Country	ICT Price Basket / Monthly Minimum Wage
1	Lebanon	3.6
2	Bahrain	4.0
3	Jordan	4.5
4	Tunisia	4.5
5	Algeria	5.2
6	Egypt	5.6
7	KSA	5.6
8	Morocco	6.7
9	Oman	10.3
10	Sudan	11.2
11	Qatar	12.2
12	UAE	15.4

Source: MRD and Orient Planet

The above two tables point to the stark differences that arise when comparing the ICT price basket based on the GNI as opposed to when based on the minimum wage. The minimum wage in Qatar, for example, is US$ 219 per month, while the monthly GNI P.C. comes in at a whopping US$ 6,703.34. Utilizing the GNI to calculate the ICT price basket, therefore, only helps to point to the great digital divide between those earning the highest salaries and those earning a minimum wage. When Qatar's ICT price basket is calculated based on the GNI, Qatar ranks second worldwide and first in the Arab World with a low 0.4 per cent of monthly GNI per capita spent on ICT services. When Qatar's ICT price

basket is based on the minimum wage, however, Qatar ranks 11th in the Arab world with 12.2 per cent of minimum wage spent on ICT services. The UAE, on the other hand, ranks second in the Arab World when the ICT price basket is based on the GNI with 0.5 per cent of GNI per capita spent on ICT services. The UAE moves to last place among Arab countries surveyed when the GNI is swapped for the minimum wage, registering 15.4 per cent. Both Qatar and the UAE have the highest number of unskilled labor in the Arab World, which is the main reason why the divide is so high. The difference clearly points to the problematic nature of using the GNI solely to calculate the ICT price basket.

The minimum wage was estimated by Madar Research and Development and Orient Planet through looking at the US State Department's Human Rights Practices report published on its website and based on actual salaries.

The minimum wage estimation does not take into account black market wages. Many people work for less than the minimum wage but only legal contracts were taken into account.

ICT Price Basket (GNI-based) Vs. (Minimum Wage-based) In Selected Countries - 2012

Global Rank	Country	GNI Per Capita $	Monthly GNI P.C.	ICT PB / Monthly GNI p.c.)	Minimum Wage $ Monthly	ICT Price Basket / Minimum Wage
8	USA	48,450	4,038	0.5	1,257	1.6
15	Japan	45,180	3,765	0.8	1,317	2.3
17	Germany	43,980	3,665	0.8	1,208	2.4
20	France	42,420	3,535	0.9	1,875	1.7
22	Canada	45,560	3,797	1	1,642	2.3

Source: MRD and Orient Planet

When the GNI is swapped with the minimum wage, the ICT price basket in developed countries also changes visibly. Germany, for example, ranks ahead of France when the ICT price basket is used to calculate the GNI, registering 0.8 and 0.9 per cent, respectively. When the minimum wage is used, however, France substantially outperforms Germany, registering 1.7 and 2.4 per cent, respectively.

Monthly Minimum Wage for GCC Nationals - 2012

Rank	Country	Monthly Minimum Wage USD	ICT Price Basket Based on Minimum Wage (Nationals)
1	Qatar [7]	2,200	1.2
2	Oman[8]	845	1.9
3	Bahrain[9]	795	2
4	UAE[10]	815	2.1
5	KSA[11]	800	2.8
6	Kuwait[12]	882	N/A

Source: MRD and Orient Planet

The above table looks at the minimum wage for GCC nationals in each country. Qatar ranks first when it comes to minimum wage for nationals in the region. GCC averages are comparable to those of developed nations when the minimum wage in question is that earned by the nationals, but when the minimum wage for expats is taken into account a sizable gap appears between the GCC and developed nations.

[7] Source: MRD estimation since there is no mandatory minimum wage in Qatar

[8] Source: www.aljazeera.net

[9] Source: www.state.gov

[10] Source: www.abudhabi.ae

[11] Source: www.state.gov

[12] Source: www.state.gov

Academic Ranking of Arab Universities

Four Saudi and one Egyptian among the top 500 universities worldwide

In 2013, only five Arab universities appeared on the Shanghai Academic Ranking of World Universities. Four Saudi universities achieved a significant milestone by placing on the ranking in its latest issue released in August 2013, ranking first on an Arab and Islamic scale. King Saud University moved from being among the top 201-300 global universities in 2012, to being among the top 151-200 global universities in 2013, while King Abdul Aziz University moved from being part of the top 301-400 global universities in 2012 to the top 201-300 in 2013. King Fahd University of Petroleum remained in the top 301-400, while King Abdullah University of Science and

Technology entered the list for the first time, ranking among the top 401-500 top global universities.

The first appearance of King Saud University on the Shanghai ranking was in 2009 on the list of the top 401-500 global universities, moving up the list in 2010 to rank among the best 301-400 universities, continuing its progress in the year 2011 to rank on the top 201-300. On an Arab scale, the University of Cairo reentered the list of the top 401-500 universities in 2012 after its absence from the list for four years, and remained in that position in 2013.

Ranking Criteria and Weights
(for details please see: www.shanghairanking.com/ARWU-SUBJECT-Methodology-2013.html)

Similar to ARWU, institutions are ranked according to their academic or research performance in each subject field. Ranking indicators include alumni and staff winning Nobel Prizes, Fields Medals and Turing Awards, Highly Cited Researchers, papers indexed in Science Citation Index-Expanded (SCIE) and Social Science Citation Index (SSCI). A new indicator, the percentage of papers published in the top 20% journals of each field, was introduced.

For each indicator, the highest scoring institution is assigned a score of 100, and other institutions are calculated as a percentage of the top score. The distribution of data for each indicator is examined for any significant distorting effect and standard statistical techniques are used to adjust the indicator if necessary.

Scores for each indicator are weighted to arrive at a final overall score for an institution. The highest scoring institution is assigned a total score of 100, and other institutions are calculated as a percentage of the top total score. The scores are then placed in descending order.

The Role of Universities in the Knowledge-Based Economy:

- Transformation from teaching to learning
- Transformation from research to innovation
- Transformation from service to engagement

Kuwait ICT Figure Discrepancies

It is difficult to collect accurate ICT figures for Kuwait due to the fact that both the Central Statistical Bureau and the Ministry of Communications publish very limited or outdated data. Kuwait is the only GCC country, for example, without a figure for the International Internet Bandwidth indicator.

Although ICT figures for Kuwait are difficult to come by, there also seems to be miscommunication between Kuwait's ICT and Statistics authorities and international organizations such as ITU, causing the latter to utilize inaccurate or outdated figures. ITU's population figure for 2012, for example, registered 2,891,553 - representing a variance of 24.38 per cent from the more accurate figure of 3,823,728; the highest variance in the Arab World. This in turn had a tremendous impact on the country's Internet penetration rate and global rank on the indicator.

According to ITU, Kuwait registered an Internet penetration figure of 79.18 per cent, ranking it 32nd in terms of global Internet penetration. When altering the penetration figure using population numbers based on official national sources, however, Kuwait's penetration significantly drops to 59.88 per cent, positioning it in the 65th spot globally.

The population figure is of primary importance, since it forms the basis for calculating numerous key indicators. If the population figure is incorrect, all indicators that measure ICT penetration will be wrong. The Central Statistical Bureau should aim to provide an accurate population figure yearly in which other accurate calculations and indicators can be based.

Kuwait Population 2012: ITU vs. National Based Figures

National Based Sources[1]	ITU[2]	Variance	%
3,823,728	2,891,553	932,175	24.38%

Source: [1]MRD/Orient Planet (based on national sources) [2]ITU

Kuwait 2012 Mobile Penetration And Global Ranking
ITU Population Figures vs. National Based Population Figures

ITU Figures[1]		ITU Figures Divided by National Based Population Figures[2]		Variance	
Penetration	Rank	Penetration	Rank	Penetration	Rank
191.11%	5	144.52%	34	46.59%	29

Source: [1]ITU [2] MRD/Orient Planet (based on national sources)

Oman ICT Figure Discrepancies

According to the annual report published by TRA Oman, the number of mobile subscriptions in the Sultanate reached 5,277,591 by end 2012, while the mobile penetration rate reached 160 per cent. While the number for mobile subscribers is accurate, the penetration rate is misleading as it appears to have been based on the 2011 mid-year population (3,295,298) figure instead of the end-year 2012 figure. According to The Omani National Center for Statistics and Information, the population of Oman in mid-year 2012 came in at 3,623,001, while the figure for January 2013 registered 3,795,468. Based on those two figures, Madar Research and Development and Orient Planet estimated the 2012 end-year population figure for Oman to come in at 3,770,473. When mobile penetration is calculated based on this figure, the penetration rate falls from the 160 per cent reported by the TRA to 139.97 per cent.

Moreover, discrepancies also arise in figures related to Oman published by the International Telecommunications Union (ITU). ITU calculates the mobile penetration rate for Oman in 2012 to register 181.73 per cent. This figure is based on ITU's utilization of a population figure for Oman that registers 2,904,037. This population figure is inaccurate, as it is not adopted from any of Oman's official sources. Moreover, the penetration rate of 181.73 per cent ranks Oman 11th worldwide on the mobile penetration indicator, while the more accurate figure of 139.97 per cent drops the Sultanate's rank down to 37th. This further underscores the need for both national Omani sources as well as international organizations to perform more stringent due diligence when collecting and publishing ICT figures.

Finally, it is worth mentioning that the population figure is of primary importance, since it forms the basis for calculating numerous key indicators. If the population figure is not correct, all indicators that measure ICT penetration will be wrong.

Oman Population 2012: ITU vs. National Based Figures

National Based Sources[1]	ITU[2]	Variance	%
3,770,473	2,904,037	866,436	22.98%

Source: [1]MRD/Orient Planet (based on national sources) [2]ITU

Oman 2012 Mobile Penetration And Global Ranking
ITU Population Figures vs. National Based Population Figures

ITU Figures[1]		ITU Figures Divided by National Based Population Figures[2]		Variance	
Penetration	Rank	Penetration	Rank	Penetration	Rank
181.73%	11	139.97%	37	41.76%	26

Source: [1]ITU [2] MRD/Orient Planet (based on national sources)

UAE ICT Figure Discrepancies

The UAE Telecommunications Regulatory Authority (TRA) released in July 2013 a report titled "UAE Telecommunications Sector Developments & Indicators, 2009 - 2012." In this report, the TRA detailed the population growth of the UAE for the years 2009-2012. According to the report "The 2009 to 2011 population estimates are based on a TRA assumption that the population was growing at an annual rate of 6 per cent. The large increase in population shown in 2012 is based on an updated population figure reported by the National Bureau of Statistics (NBS)"

When Madar Research and Development and Orient Planet compared the figures published by the TRA to those published by UAE National Bureau of Statistics (NBS), however, clear discrepancies emerged. While the TRA stated that in 2009, the population of the UAE came in at 5,066,000, the NBS published a figure of 8,199,996 for the same year. Figures published for 2010 faced the same problem, as the TRA's figure registered 5,378,460, while the NBS 8,264,070. Moreover, the TRA stated that it assumed the population to be 'growing at an annual rate of 6 per cent", but when Madar Research and Development and Orient Planet recalculated the growth based on the TRA's own figures, growth for 2011 came in a 9.39 per cent instead. (growth for 2010 was indeed 6.17 per cent).

It is curious that the UAE's TRA, a highly developed and resourceful entity, would resort to figure estimation when more accurate population figures are available from the NBS. Although NBS does not have the latest yearly figures but those for 2009 and 2010 were available but not utilized by the TRA. This is unusual as the NBS was created to provide accurate figures.

The population figure is of primary importance, since it forms the basis for calculating numerous key indicators. If the population figure is not correct, all indicators that measure ICT penetration will be wrong.

UAE Population as Per TRA 2009-2012				
	2009	2010	2011	2012
Population Growth*	5,066,000	5,378,460 6.17%	5,883,653 9.39%	8,209,459 39.53%

Source: TRA - *Growth calculated by MRD/Orient Planet

UAE Population as Per NBS 2009-2012				
	2009	2010	2011	2012
Population	8,199,996	8,264,070	-	-

Source: NBS

UAE Population as Per MRD 2009-2012				
	2009	2010	2011	2012
Population	8,199,996	8,264,070	8,470,672	8,809,499

Source: MRD and Orient Planet

Qatar ICT Figure Discrepancies

According to an ITU report titled "Measuring the Information Society" published in October 2013, the percentage of individuals using the Internet in Qatar registered 88.1 per cent by end 2012. Meanwhile, according to Qatar's ICT Landscape 2013, a report published by ictQATAR in January 2013, Internet penetration among the mainstream population registered 88 per cent in 2012 while Internet penetration among the overall population registered 69.3 per cent in 2012.

ictQATAR defines transient labor to "predominantly consist of semi-skilled or unskilled expatriate workers with low levels of education living in temporary housing" and estimates them to make up 26 per cent of Qatar's total population. These transient workers are not counted towards making up the 'mainstream population' of Qatar.

According to Qatar Statistics Authority, the April 2010 census revealed that the total population of Qatar was 1,699,435. The population living in household was 779,426 (45.86 per cent of total population), while non-household population (mostly unskilled workers living in labor camps / group quarters) was 920,009 (54.14 per cent of total population). Moreover, according to figures distributed in a news conference held in September 2013 and attributed to the Nepali Embassy, there are 340,679 Nepalis in Qatar, most of whom work in construction. The Indian Embassy also estimates the presence of around 600,000 expatriate Indians in Qatar, majority of whom are blue collar workers.

Madar Research and Development (MRD) and Orient Planet analyzed all official figures available and came to the conclusion that ictQATAR underestimated the percentage of transient labor of Qatar's total population (26 per cent, according to ictQATAR), and consequently all penetration rates based on overall populations were inflated. In light of these figures, the best estimate of Internet users as a percentage of overall population in Qatar should register no more than 55 per cent, mainly due to the fact that over half of the population comprises those living in labor camps/group quarters, the majority of whom are unskilled workers with very limited or no access to the Internet.

Opinion

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Smart City of Dubai: Transformation Challenges

While a person's share of electricity was one of the most important indicators to measure the progress of nations in the 20th century, the International Internet Bandwidth per capita now sits at the forefront of indicators that measure progress in the 21st century, the century of information and knowledge .

The single user's share of international Internet bandwidth in the UAE is still low compared to developed countries . Despite the fact that the UAE topped Arab countries on the indicator, it was nevertheless ranked 52nd worldwide. In 2012, the user's share of international Internet bandwidth in the UAE reached about 49,112 bits per second, which is about 5 times less the rate in Denmark, for example, noting that the latter occupied the 10th place globally on the indicator (as highlighted in the Arab e-Landscape Report published by Madar Research in 2013). The per capita bandwidth shares fared slightly better in Dubai than the UAE as a whole, but certainly even Dubai's share should increase significantly in line with the ambitious plans that seek to transform Dubai into a smart city. This increase must also be accompanied with the development of several mobile applications, such as those that monitor traffic, deliver complaints and petitions and conduct instant polls; applications that Dubai government departments are working on developing.

E-government services

The UAE ranked first among Arab countries and 28th worldwide on the global e-government development index in 2012, published by the United Nations; a good ranking, but more work is required in order to advance further on the list. Dubai, on the other hand, was ranked 15th among the top 92 cities in the world in the study "Digital Governance in Municipalities Worldwide (2011-12)" conducted by Rutgers University.

Dubai occupied the sixth place in privacy and information security, ranked ninth in e-services, 15th in ease of use, 32nd in e-content and 21st in social participation. This means that Dubai needs to exert more effort to develop its e-content and social participation.

University education

Universities in developed countries have transformed from advanced centers for scientific research to centers of innovation, while universities in the UAE entered the phase of scientific research hesitantly. The difference between research and innovation is massive, as while research generates new knowledge (the steam engine, for example), innovation produces goods or services that are based on scientific research (the train, for example). If Dubai wants to transform into a Smart City, it has to take great care of this matter and allocate adequate budgets for scientific research and innovation.

Basic education

The number of computers available for every 100 students in Dubai is still very low (less than 10 devices per one hundred students). In a Smart City, access to a computer for each student, as is the case in developed countries, is required. It is possible to reach this percentage in government schools but difficult to achieve in private schools for the foreseeable future. This must be coupled with the availability of all curricula for all stages of education in interactive electronic formats, and this in turn requires an extensive qualification process of educational staff.

Health

Most developed nations utilize systems for the classification of hospitals which evaluate the level of health care provided by each hospital, using a set of international standards. This classification helps patients choose a hospital suitable for their needs in terms of technological advances as well as the availability of appropriate staff. A Smart City needs a sophisticated system for the classification of hospitals, and we believe that the Dubai Health Authority should work on the establishment of this system in the coming years.

Innovation

Innovation is a cornerstone of the Smart City . Despite the emergence of many creative ideas in Dubai , there is no effective system linking these ideas in order to produce new knowledge, preserve

and transfer the knowledge, and provide the skills needed to develop products and services based on such knowledge. A good starting point would be to conduct an annual study to measure the level of innovation among companies in Dubai . It's preferred to use the methodology used by the European Union (European Community Innovation Survey methodology) to produce the Dubai Community Innovation Survey (DCIS). The study will measure the level of innovation in the field of goods and services, marketing, and economizing expenditure. It will also identify the effects of innovation on the evolution of the city and the factors that hinder innovation.

In conclusion, there are many other factors that must also be evaluated, particularly in the areas of sustainability of skilled labor, as the number of Dubai residents within the 55-64 age group came in at only 2 per cent in 2012 (according to the Dubai Statistics Center), a low rate, as this group in particular has the expertise and wisdom demanded to further advance the vision of a Smart City.