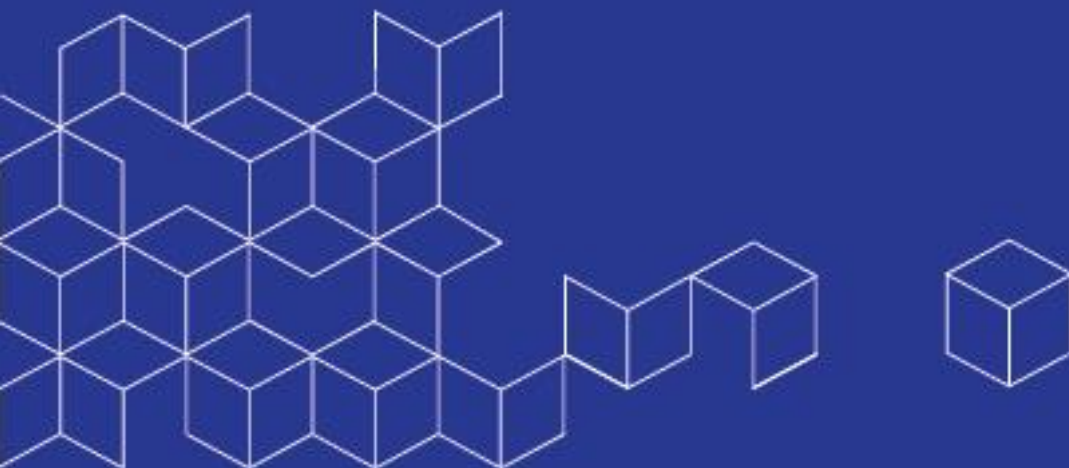# THE ICT INDUSTRY

AN ANALYSIS OF ICT ACTIVITIES FOR LEBANON

INTRODUCTION

The Lebanese Information Technology (ICT) sector is a fast growing sector with a market size of USD 381 million in 2014[1] and expected to reach a value of USD 530 million by 2017[2]. Lebanon's ICT sector has grown by an average annual rate of 7.9% over the period 2009-2014[3] and is expected to grow at a CAGR of 7.24% from 2015 to 2018[4]. According to Business Monitor International, Lebanon's ICT market is forecasted to be a "regional outperformer over the medium term as strong economic growth strengthens market expansion".[5] Lebanon ranked 5th in the Middle East and North Africa on the ICT Development Index (IDI) in 2013[6]. Some elements contributing to the market's expansion include rising income, declining device prices and modernization initiatives takes by enterprises and the public sector.

Table 1 displays ICT's forecasted contribution to the Lebanese economy by 2017. ICT's impact on GDP, whether direct or indirect, is forecasted to be greater than USD 6 Billion. Its employment impact is estimated to reach around 6000 new jobs.[7] Moreover, exports of ICT related activities[8] constituted an estimated 34.8% of total of service exports in 2013[9]; this represents the highest share among regional countries.

**Table 1: Forecasted Contribution of ICT Sector to the Economy by 2017**

Direct impact of ICT on GDP	**Indirect impact of ICT on GDP**
Direct impact on GDP due to spend on ICT	Indirect impact on GDP due to synergies effect across key economic sectors
USD ~3.2 - 3.4Bn	**USD ~3 - 3.3Bn**
Indirect non-ICT impact on GDP	**Employment impact**
Implicit induced impact on GDP from capital expenditures, due to capital deepening and high Total Factor Productivity (TFP)	Additional direct and indirect jobs created in the ICT sector and other key economic sectors
USD 0.8 - 1.0Bn	**+ ~ 6,000 jobs**
Social impact	**Government Proceeds**
Social benefits stemming from ICT adoption, measured by Gallup-Healthways Well-Being Index Uplift (%)	ICT proceeds via revenue share, VAT, corporate tax, privatization, spectrum fees, and savings on national debt
+4%	**USD ~ 9Bn**

Source: Ministry of Telecommunications, Progress Report 2013. Booz & Company analysis.[10]

Lebanon's ICT sector is still in its infancy stage with traditional Web Design and Software Development dominating its activities (Figure 1). Nevertheless, Lebanon is currently witnessing the rise of companies undertaking silicon-valley endeavors, such as e-commerce, cloud computing and healthcare IT, which are high growth products and services.

Companies engaged in the creation of Software Products and Services employ a total of around **5000 high-skilled individuals**, with demand for ICT skills significantly increasing on a year-on-year basis.[11] There are around **200 companies** engaged in Software Products and Services; mostly small and medium-sized businesses[12] involved in Software Development, Web Solutions, and Mobile Services and Applications.

Figure 1: Distribution of IT companies by Type of Activity (in %)
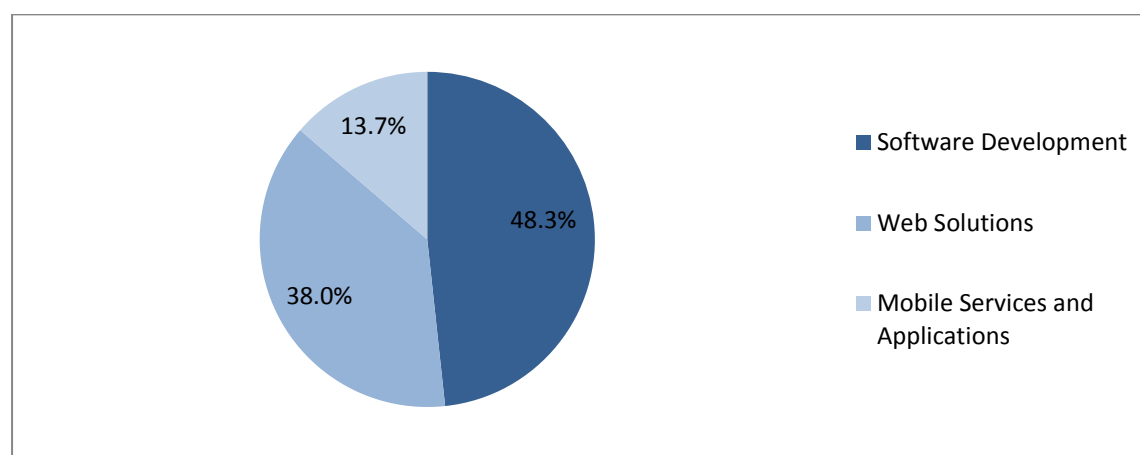
Source: Investment Development Authority of Lebanon Calculations, 2015

Lebanon enjoys a thriving business environment with the proliferation of incubators and business development centers, and the emergence of a number of success stories of Lebanese start-ups companies turning global. Today Lebanon boasts a series of incubators and accelerators which have managed to graduate companies that are now global players in the field. Financial support to the sector is gaining momentum. In 2013, the Central Bank of Lebanon issued Circular No. 331, through which an amount of up to USD 400 million will be dedicated to Lebanese banks' equity investment into startups, incubators, accelerators, and funds operating in Lebanon. These investments will be 75% guaranteed by the Central Bank. In addition to this, international institutions are earmarking funds for SME start-ups. In 2013, the World Bank signed the "Supporting Innovation in Small and Medium Enterprises" project, which is managed by Kafalat. This project includes an Innovation in SMEs funding program (the iSME fund) which provides loans of USD 25 million for equity investment in Seed, Early/Venture, and Growth stage firms, as well as USD 2.5 million for Concept Development Grants[13]. Lebanon is also witnessing the emergence of clusters: the government issued a new decree that led to the establishment of the Beirut Digital District (BDD) which offers high end premises, fiber optic connection and reduced rates to companies in the fields of IT, Technology and Telecom.

RATIONALE FOR THE STUDY

IDAL is entrusted as per Investment Law No.360 with identifying investment opportunities in sectors with the propensity and potential to grow. Given the importance of the ICT sector to the economy and its potential, a detailed analysis was conducted to assess the competitive advantages of the sub-sectors which Lebanon could have a higher potential to thrive in. Identifying these sub-sectors will allow policy makers to direct resources, policies and legislation to the right sub-sectors which have displayed a highest propensity to grow given their competitive advantages. The identification of the sub-sectors with the highest investment potential was conducted using the following method:

- Identification of the prerequisites in education, infrastructure, laws and regulations, as well as capital that ensure the success of each subsector in ICT
- Study of the global and MENA trends in each subsectors
- Baseline analysis of the ICT sector in Lebanon including skills, infrastructure, the condition of current laws and regulations, and the possibility of linkage with other markets or industries for each subsector.

This study was conducted in partnership with the Presidency of the Council of Ministers, the Ministry of Telecommunications, Lebanon for Entrepreneurs (LFE), and MEVP.

1. IT Trends in the MENA Region

The MENA region is a vital player in ICT : The region's IT spending stood at USD 211 billion in 2014, an 8% increase from 2013 (Table 2). It is projected to reach USD 242.8 billion by 2018, accounting for 5.6% of worldwide IT spending. This increase can be accredited to smart government, big data, and increased investments by vertical markets:[14] Communications, Media & Services, Banking & Securities, and Healthcare will observe the highest spending growth: 6.1%, 5.3% and 4.5% respectively.[15]

The growth in the MENA ICT market is compounded by a rapidly increasing regional internet market. Indeed, the number of Internet users in the Arab world is expected to reach 197 million by 2017[16].

Table 2: Middle East - IT Spending Estimate (USD Billion)

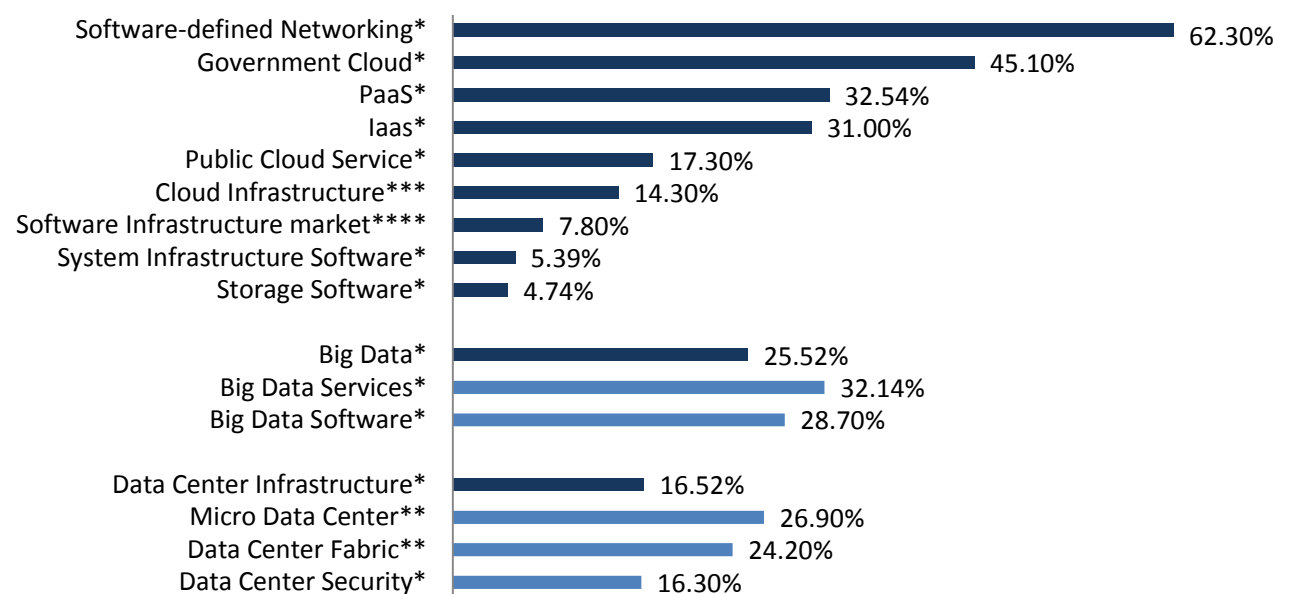|	2013	2014	2015	2016	2017	2018
Devices	30	37.2	41.3	47.4	50.5	56.5
Data Center Systems	3.7	3.8	3.9	3.9	4	4
Software	4	4.5	4.9	5.3	5.8	6.3
IT Services	8.7	9.3	9.7	10.1	10.5	11
Telecom Services	149.2	156.4	160.1	162.6	164.1	165
Overall IT	**195.6**	**211.1**	**219.8**	**229.2**	**235**	**242.8**

Source: Gartner, March 2014[17]

As seen above in table 2, Telecom Services will have the highest share of spending in 2018 (74%), followed by Devices and IT services. In terms of growth, the devices markets is expected to grow at a CAGR of 13.5% for the devices market, the highest over the period 2013-2018.[18] Software will come second with a CAGR of 9.5%. Conversely, data center systems will have the lowest CAGR over the forecasted period (1.6%).[19] Software hubs reside in sizable institutions in telecom, banking, air travel and defense sectors.[20]

2. Global and Regional Trends in IT sub-sectors

Infrastructure

The software infrastructure market is expected to grow at a CAGR of 7.8% for the 2014-2018 period.[21] More specifically operating systems are expected to have a market value of USD 60.5 billion by 2018, accounting for the largest proportion of the software infrastructure market.[22] Software-defined Networking is expected to grow at a CAGR of 62.3% for the 2013-2018 period, making it the fastest-growing sub-segment.[23] Other noticeable sub-segments are government cloud, PaaS, and big data services with CAGRs of 45.10%, 32.54%, and 32.14% respectively for the period 2013-2018.[24] Figure 2 summarizes the growth trends of the major sub-categories of software infrastructure.

Figure 2: Projected global CAGR of different categories in the software infrastructure sub-sector

Category	CAGR
Software-defined Networking*	62.30%
Government Cloud*	45.10%
PaaS*	32.54%
Iaas*	31.00%
Public Cloud Service*	17.30%
Cloud Infrastructure***	14.30%
Software Infrastructure market****	7.80%
System Infrastructure Software*	5.39%
Storage Software*	4.74%
Big Data*	25.52%
Big Data Services*	32.14%
Big Data Software*	28.70%
Data Center Infrastructure*	16.52%
Micro Data Center**	26.90%
Data Center Fabric**	24.20%
Data Center Security*	16.30%

*CAGR for 2013-2018
**CAGR for 2014-2019
***CAGR for 2013-2017
****CAGR for 2014-2018
Sources: Gartner, IDC, Kable, Sandler Research, MarketsandMarkets, Forbes, ReportsnReports, TechNavio, United Nations Conference on Trade and Development. [25]

In the MENA region, spending on application infrastructure and middleware is increasingly significant with private cloud, security, mobility and data center modernization being the key drivers in infrastructure spending.

The data center market in the Middle East is fuelled by increased construction of Tier 3 and Tier 4 data centers, especially in Saudi Arabia and UAE, primarily driven by multinational corporations and regional hosting service providers. Servers are the largest segment of the IT infrastructure market with revenue reaching USD 1.54 billion in 2013, and estimated to reach USD 1.69 billion in 2016.
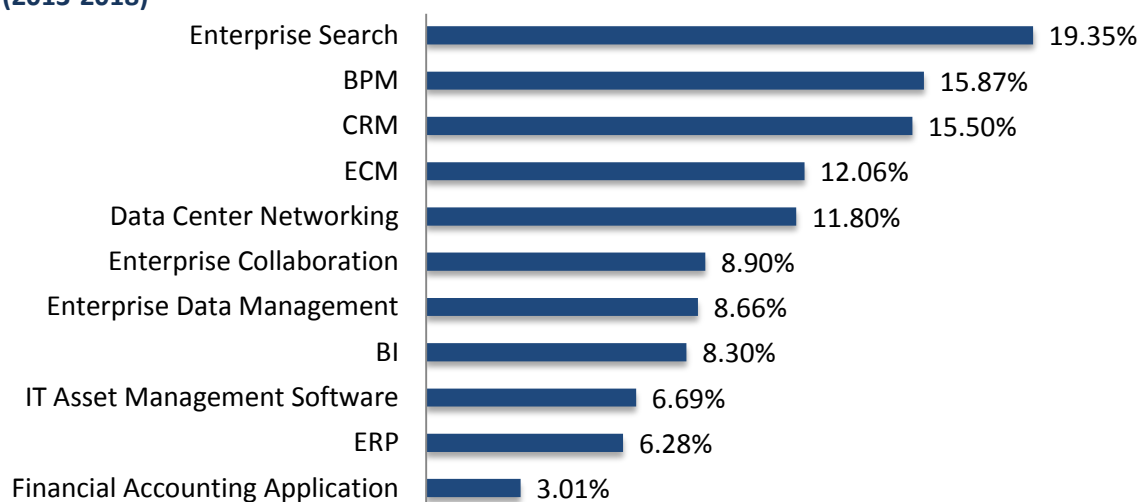
From 2014 through 2018, USD 4.7 billion will be spent on cloud services in the MENA region. The public cloud services market in the MENA region is on pace to total USD 620 million, up from an estimated USD 511 million for 2013.

The Platform as a Service (PaaS) industry will surpass USD 46 million by 2016.[26] Infrastructure-as-a-service (IaaS) is expected to grow from USD 60 million in 2013 to USD 170 million in 2018.[27]

Enterprise Software

Worldwide spending on enterprise software has reached USD 296.6 billion in 2013, accounting for around 8% of IT spending.[28] Spending on enterprise software has been growing at a CAGR of 6.9% until 2013 and is expected to reach 8.2% by 2018. The largest growing sub-sectors within this segment include enterprise search, business process management (BPM) and customer relationship management (CRM) (Figure 3).

Figure 3: Projected global CAGR of different categories in the Enterprise Software Sub-Sector (2013-2018)

Category	CAGR
Enterprise Search	19.35%
BPM	15.87%
CRM	15.50%
ECM	12.06%
Data Center Networking	11.80%
Enterprise Collaboration	8.90%
Enterprise Data Management	8.66%
BI	8.30%
IT Asset Management Software	6.69%
ERP	6.28%
Financial Accounting Application	3.01%

Source: Gartner, MarketsandMarkets, MicroMarketMonitor, ReportsnReports, ResearchandMarkets, Sandler Research, TechNavio. [29]

In the MENA region , the market for enterprise software is expected to grow at a CAGR of 10% from 2012 to 2015, fuelled by spending on database management systems, operating systems, and enterprise resource planning.

In the MENA, SaaS is expected to grow by 26.3% in 2014 and is expected to reach USD 307 million in value by 2018.[30] The market is predicted to demonstrate high growth fuelled by spending on public cloud services. From 2012-2017, the Middle East is expected to have the highest cloud traffic growth rate; a CAGR of 57% from 2012 to 2017 (Table 3).[31] Moreover, from 2014 through 2018, USD 4.7 billion will be spent on public cloud services in the MENA.[32]

Table 3: Cloud traffic growth and Workload distribution in MENA

	2012	2013	2014	2015	2016	2017	CAGR 2012-17
Cloud Traffic Growth (Exabytes)	17	31	51	77	112	157	57%

Total Data Center Workloads in Millions	1.4	1.8	2.4	3.1	3.9	4.8	27%
Cloud Data Center Workloads in Millions	0.4	0.7	1.1	1.6	2.2	2.9	45%
Traditional Data Center Workloads in Millions	1.0	1.1	1.3	1.5	1.7	1.9	13%

Source: Cisco Analysis, 2013 [33]

CRM is expected to contribute to 30% of all spending on SaaS in the MENA region through 2018. In addition, the data center market is expected to grow at a CAGR of 10.55% over the period 2013-2018. Table 4 displays details on enterprise IT spending by vertical markets in the Middle East and Africa.

Table 3: Enterprise IT spending by Vertical Market in MEA (Billions of Euros)

	2011	**2012**	**2013e**	**2014e**	**2015e**	**2011-2015 CAGR**
Banking & Securities	11,849	12,721	13,338	13,932	14,590	**5.30**
Communications, Media & Services	9,718	10,415	11,045	11,620	12,303	**6.1**
Education	1,878	1,998	2,075	2,142	2,218	**4.2**
Government	12,371	13,130	13,638	14,119	14,666	**4.3**
Healthcare Providers	3,037	3,261	3,404	3,512	3,615	**4.5**
Insurance	4,148	4,438	4,607	4,746	4,906	**4.3**
Manufacturing & Natural Resources	10,834	11,266	11,643	11,904	12,208	**3**
Retail	3,127	3,261	3,328	3,425	3,540	**3.1**
Transportation	3,255	3,500	3,642	3,743	3,858	**4.3**
Utilities	3,906	4,178	4,328	4,459	4,583	**4.1**
Wholesale Trade	1,549	1,658	1,707	1,763	1,812	**4**
Total	**65,672**	**69,826**	**72,755**	**75,365**	**78,299**	**4.5**

Source: Gartner, 2012 [34]

Healthcare & Biotech

Healthcare IT & e-health- The global Healthcare IT market is set to grow at a CAGR of 5.7% for the period 2013-2018. More specifically, the healthcare sector **in the MENA region** is expected to grow at a CAGR of 6.6% and reach a market value of USD 144 billion by 2020, significantly higher than the USD 81.1 billion recorded in 2011[35] . This growth is fueled by increasing demand for healthcare services in the GCC. Indeed expenditure on healthcare services in the GCC hovered at USD 44 billion in 2011 and is projected to grow at approximately 15-16% until 2017-18.[36]

The market for outpatient visits in the GCC is estimated at 115 million visits annually with an estimated annual market value of USD 7 billion[37] and a projected growth of over 11%[38], with e-Visits in the GCC accounting for around USD 2-3 billion of that market.[39]

Medical devices- The global market for medical devices is expected to grow at a CAGR of 4.46% over the period 2014-2018. In vitro diagnostics will be the industry's top segment by 2018, with sales of USD 54.5 billion. Neurology devices will post the fastest growth, expected to expand by 6.1% per year to reach USD 7.3 billion by 2018.

The MENA market for medical devices is displaying impressive growth and significant progress, driven by population growth, urbanizations and increasing government investments in healthcare. The market is expected to double within 5 years, increasing by about USD 1 billion annually.

Biotech- The global biotechnology industry was estimated at USD 289 billion in 2014[40] and is expected to grow at a CAGR of 12.3% from 2014 to 2020[41]. Biotechnology products represented 21% of the global market for prescription drugs in 2012 and is expected to grow to 25% by 2018[42]. The global Biotechnology industry continues to be populated by many small companies, alongside a few giant pharmaceutical, chemical and agricultural firms.

The MENA region is becoming an attractive hub for multinational biotech companies looking for opportunities in the Middle East, with the rise in chronic diseases and demand for biotech products, compounded with the availability of incentives put in place by Arab governments to spur the development of the biotech industry.[43] Aside from specialized biotech companies such as Amgen and Genzyme, many of the major pharmaceutical companies including Roche, Novartis, Pfizer and GlaxoSmithKline market and manufacture biotech products in the Middle East.

E-Government

Globally, e-government investment is set to increase from USD 28 billion in 2010 to USD 57 billion in 2016, with the number of users tripling over this period.[44] As many as 35% of government shared-service organizations will be managed by private sector companies.[45]

Governments across the Gulf Cooperation Council (GCC) countries are mounting their e-government services in order to meet the demands of constituents. The GCC e-government Development Index is growing at twice the rate of the global average and the GCC may overtake Europe as the leading region providing e-government services by 2015.[46]

E-government initiatives include the UAE's *Government Portal* and Dubai's *Smart Government*, The Kingdom of Saudi Arabia's *Yesser,* Qatar's *Hukoomi,* Oman's *Omanuna*, Kuwait's *Kuwait Government Portal*, and Bahrain's *eGovernment Portal*.[47]

E-Payments

The worldwide mobile payment market is estimated to have over 450 million users and transactions worth more than USD 721 billion in value in 2017. This represents a CAGR of 18% and 35% respectively for the period 2012-2017.[48]

The MENA region's share of this market is minimal, but it is expected to grow at a CAGR of 80% till 2017, with transactions estimated to be worth USD 27.6 billion. Almost 90% of these transactions will be remittances from expats. While bank account and credit card penetration exceeds 70% in most of the GCC, large immigrant populations are spurring mobile payment transactions.[49]

In some of the MENA countries, mobile money is now gaining popularity. At the end of 2013, deployments in MENA represented 6% of the live mobile money services globally and 13% of total planned services, indicating that the region will become increasingly important for the industry globally.[50]

Online banking in the GCC has not yet reached maturity levels. Only a third of all GCC bank customers have signed up for online services, and only 18% of total customers are active online.[51]

E-Commerce

Worldwide e-Commerce is forecasted to grow at a CAGR of 13.54% over the period 2013-2018.[52] Business-to-Consumer (B2C) e-commerce sales will increase by 20.1% in 2014, to reach USD 1.5 trillion.[53] Global online retail sales will account for 16.6% of total retail sales by 2020, indicating that one out of every 10 retail transactions will be an online transaction. This increase in online retailing is ushering new urban logistics business models.

According to PayPal's Insights e-commerce in the Middle East 2012-2015 report, 30 million people are currently shopping online in the Middle East, up by 65% from 2011.[54] **In the MENA region**, online sales account for less than 1% of total retail sales but is expected to grow at a fast rate. E-commerce sales accounted for USD 27 billion in 2013 and is set to reach USD 15 billion by 2015. A significant amount of that spending will be due to mobile commerce. In 2011, mobile transactions made up 10% of e-commerce (similar rates compared to the rest of the world), and are expected to reach 20% in 2015. "Cash On Delivery" is the predominant payment method, making up roughly 70% to 80% of all transactions. Although penetration of e-commerce varies across the different countries of the region, it remains fairly low overall. The top consumers in the Middle East are located in the UAE, with Dubai leading the way.

Consumer Internet

Web and mobile portals, Content websites and apps, News, Internet publishing- 17.4% of global web traffic comes from mobile compared to 11.1% in 2012. As more and more people will start accessing the Internet through their mobile devices, demand for mobile-optimized content will increase. In 2018, app revenues are expected to reach USD 92 billion. The most popular app store categories in March 2014 were Games (18.29%), Education (10.54%), Business (8.22%) and Lifestyle (8.15%). Travel came 8th with 4.9% total downloads from all downloads on the app store. The most popular mobile app, however, is Google Maps with 54% of global smartphone users using the app within the end of 2013.

Social Networks and apps- Globally, consumers continue to spend more time on social networks than on any other category of sites, accounting for roughly 20% of their total time online via personal computer, and 30% of total time online via mobile. Between March 2013 and March 2014, the messaging app market exploded. The top seven messaging apps expanded by 148%, adding 900 million users.

In the MENA region, around 65% of internet users use social networking sites in 2014. There are more than 36,000 new Facebook users arising every day from the MENA. 85.6% of the social network audience, 54.5% of internet users and 13.4% of the population are estimated to use Facebook in 2014.

Search- The global search engine industry is worth more than USD 16 billion and is dominated by the big 5 search engines: Google, Baidu, Yahoo, Yandex and Microsoft (including Bing).[55] Two trends are picking up in this domain: semantic search and online audience optimization which is believed to replace SEO.

In the Arab world, search is growing at around 25% each year.[56] Search engine marketing is frequently used by marketers, with 56% of companies in the Middle East using search engine optimization (SEO) and 35% using pay-per-click (PPC).[57]

Adtech

In 2013, total Internet advertising revenue stood at USD 117.2 billion.[58] The figure is expected to increase to USD 194.5 billion in 2018, growing at a 10.7% CAGR.[59] The major trends in adtech are the following: [60]

- *Mobile* is expected to reach around USD 37 billion by 2018
- *Search* was estimated at USD48.4bn in 2013, and expected to hit USD73.8bn in 2018
- *Video* expected to rise at a 23.8% CAGR until 2018

In 2013, online advertising spending amounted to USD 300 million **in MENA** and is currently expanding by 37% per year to reach USD 1 billion in 2017.[61]

Media streaming

Digital music streaming revenue will grow at a 13.4% CAGR, and electronic home video OTT/streaming will have a 28.1% growth rising from USD 6.6 billion globally in 2013 to USD 22.7 billion by 2018.[62] Video is expected to account for more than 2/3 of all mobile traffic in 2016. Online music revenues **in the MENA** are expected to grow sharply, at a CAGR of 60% reaching USD 33 million in 2014.[63] At present, the Arab music streaming industry is estimated at USD 1.1 billion.

Gaming

The global CAGR for gaming is estimated at 8.9% for the period 2013-2017. In 2013, mobile gaming accounted for 23% of the global gaming market, and is forecasted to reach 34% with a value of USD 35 billion by 2017.[64] The number of gamers worldwide is expected to reach 1.55 billion by 2016.[65] **In the Middle East**, digital game sales are set to rise at a CAGR of 29 % to reach USD 3.2 billion in 2016[66]. This is mainly due to the presence of a young population. Indeed, about 60% of the 350 million people in the Arab world are younger than 25, with internet penetration in the region at about 70 million users, accounting for over 300% growth in the last five years.[67]

E-Learning

The global e-learning market is expected to grow at a CAGR of 25.81% over the period 2013-2018.[68]

In the Middle East, the e-learning market was estimated at USD 443 million in 2013 and is expected to reach USD 560.7 million by 2016. Oman has the highest growth rate for e-learning, currently standing at 19.6%. It is followed by Lebanon (16.0%), Turkey (12.9%), Kuwait (12.6%) and Qatar (11.3%).[69] The GCC share of the MENA e-learning market will be 71% by 2016 amounting to USD 378.4 million.**[70]**

Table 5: e-Learning industry in MENA

Revenues in 2013	USD 443 million
Annual growth rate	8.2%
Revenues by 2016	USD 560.7 million

Source: Docebo, 2014

According to a study developed by Deloitte in 2014, student registrations in Massive Open Online Courses (MOOCs) will be up by 100% compared to 2012 to reach over 10 million courses. Enterprise training and continuing education are the fastest adopter of MOOCs, with significant

growth in 2014 and 2015. The higher education market and the corporate skills development market have the biggest share with USD 400 billion and USD 130 billion per year respectively. MOOCs look very promising and are anticipated to be a major factor by 2020, representing over 10% of all courses taken in higher and enterprise continuing education.[71]

VAS

The global mobile VAS market is expected to grow at a CAGR of 10.67% over the period 2012-2016.

The Middle East has played a key role in contributing to the growth of the global mobile value-added-service (VAS) market, which is estimated to have expanded its revenue base from USD 200 billion in 2009 to USD 340 billion by 2014.[72] By 2018, Cisco expects nearly 5 billion mobile users with more than 10 billion mobile devices or connections, with faster network speeds and more smart devices, to drive mobile video to 69% of the overall mobile data traffic globally.[73] In terms of regional mobile data traffic growth rates, the Middle East and Africa will have a 70% CAGR and a 14-fold growth from 2013 to 2018.[74]

Semi-Conductors

Global semiconductor revenue will log a CAGR of 3.4% from 2013 to 2018, reaching USD 384 billion in 2018.

In the MENA region, Abu Dhabi has made significant recent investments as part of its vision to become a major player in a USD 20 billion global chip making industry. State-owned Advanced Technology Investment Company (Atic) is building an advanced technology cluster to manufacture semiconductors and attract other semiconductor companies into the region. In 2009, Atic invested USD 1.4 billion in partnership with US company Advanced Micro Devices to create a manufacturing division, Globalfoundries. In 2010, Atic paid USD 1.8billion for a majority stake in Chartered Semiconductor of Singapore, which elevated Globalfoundries to the third-largest contract chipmaker in the world.

Small Hardware Products

The global IT Hardware market is expected to grow at a CAGR of 6.1% from 2014 to 2018. Despite increasing sales of computers over the past five years, falling computer prices have been impeding revenue growth for the industry. In addition, firms have had to face rising competition from tablets. Indeed, the number of PCs will fall from 28.7% of the device market in 2013 to 13% in 2017. Tablets will increase from 11.8% in 2013 to 16.5% by 2017, and smartphones will increase from 59.5% to 70.5%. The industry is expanding to emerging markets, where rising disposable incomes are boosting these regions' demand for computers and hardware.

The industry has low market share concentration, with the top four players accounting for less than 30.0% of industry revenue. However, market share concentrations within the industry vary by region. Some niche manufacturers of hardware and peripherals such as disk drives and printers exhibit higher degrees of concentration than the overall industry.

The hardware market **in the MENA** is largely driven by increased consumer spending on personal computers and corporate and government investments in expanding existing infrastructure and systems. While some small and medium size businesses are capturing a share of the personal-computer market, the hardware market remains largely dominated by international infrastructure/systems players such as IBM, Cisco, Sun Microsystems, HP, Siemens and others.

Telecom Services

The global telecommunication services industry is expected to reach USD 1.8 trillion in 2017 with a CAGR of 3.8%. 66 % of global revenue growth will come from emerging Asia–Pacific countries, with three countries that will account for about 60 % of global revenue growth: China (40 %), India (12 %) and Brazil (8 %). Enterprise and governmental users are key customer segments for telecommunications service providers.

In the MENA region, the market is expected to grow at a 2.9% CAGR to reach USD 96 billion by 2018. Mobile data and fixed broadband will be the services showing the highest growth, driven by increasing smartphone penetration and Internet demand. The fastest growth area will be mobile data services, with handset data revenue set to grow at a CAGR of 17.9 % between 2012 and 2017. By 2016, MENA will overtake Europe as the second largest region for mobile subscribers. Telecom services will be the largest segment of overall IT spending in the banking and securities market in 2014.

Telemarketing and Call Centers

Most companies in the telemarketing industry have an annual growth between 6.5% and 8%. This growth rate is due to businesses that are becoming increasingly aware of the need for market information and the desire to reduce customer turnover rates in a hard hit economy. The telemarketing industry is fragmented with companies that vary greatly in size, scope, services offered, and market share.

3. Lebanon Competitive Advantages

Skilled and Educated Labor Force

- Lebanon ranks 28th worldwide for the Quality of its Educational System (Table 6)
- Lebanon ranks 5th for its Quality of Math and Science Education worldwide

Table 6: Selected pillars, sub-pillars and indicators for Lebanon, 2014

	Score (0–100) or value (hard data)	Rank
Business Sophistication	**39.1**	**38**
Knowledge Workers	**65.5**	**18**
Knowledge-intensive employment, %.	31.9	41
Firms offering formal training, % firms	52.4	21
Innovation Linkages	**24**	**78**
University/industry research collaboration	35.5	106
State of cluster development	37	110
Knowledge Absorption	**24.0**	**78**
FDI net inflows, % GDP	8.7	17
Quality of Education	**4.8**	**32**
Quality of the Educational System	**4.6**	**28**
Quality of Math and Science Education	**5.7**	**5**
Knowledge & Technology Outputs	**22.6**	**96**
Knowledge Creation	**16.3**	**64**
Knowledge Impact	**24.7**	**116**
High- & medium-high-tech manufactures, %	22	48
Knowledge Diffusion	**26.7**	**97**
High-tech exports less re-exports, %	0.2	93
Comm., computer & info. services exp., % total trade	1.7	50
Creative Outputs	**27.4**	**93**
Creative Goods & Services	**29.5**	**39**
Online Creativity	**8.2**	**100**

Source: Global Innovation Index 2014 Report [75]

Infrastructure

- In 2014, Lebanon's <u>fixed broadband penetration rate of 22.8 subscriptions per 100 inhabitants</u> was higher than the global average of 10.3 subscriptions per 100 inhabitants, developing economies' average of 6.6 , as well as the Arab world average of 3.4[76]. It grew at a CAGR of 16.4% during the 2008-2013 period compared to a CAGR of 14.7% for developing economies.[77] The average download speed of both mobile and fixed networks is around 1.6 mbps and the average upload speed is 0.5 kbps.[78]
- In 2013, Lebanon ranked <u>49th </u>among 208 countries <u>in terms of Internet penetration</u>, with 70.5 users per 100 inhabitants having access to an internet connection, which represents a 13% rise from 2012. Lebanon's Internet penetration rate is above the global average of 37.9 users, the Arab average of 37.4 users, and the developing economies' average of 29.9 users. Internet users grew at a CAGR of 25.6% during the 2008-2013 period compared to a CAGR of 15.3% for developing economies and 18.2% for Arab countries.[79]

Improving Legal Framework

- A Cybercrime Bureau was established in 2006 to provide the public prosecution with the necessary technical expertise to deal with internet-related crimes. The bureau is attached to the Special Criminal Investigations Unit at the Internal Security Forces (ISF) but was not established according to legal protocols. Lebanon has not yet established legislations related to cyber security. The e-transaction law does not clearly address cyber security issues.
- The draft of legislation on electronic signatures is pending parliamentary approval
- Law 431, or the Telecommunications Law, which would allow free competition among private telecom providers while still under government regulation, would bring Lebanon in line with most of the developed world. It was issued in 2002 to provide the framework for governing the organization of the telecommunications services sector and to set the rules for its transfer to the private sector. It is yet to be implemented.
- Draft law on e-Transactions and Protection of Personal Data. It is yet to be approved.
- Draft law aimed at giving the government the right to legislate in the field of Customs to facilitate imports and exports. Approved and published
- Draft law aimed at exempting profits of industrial exports of Lebanese origin of 50% of the tax due. It is yet to be approved.

Research and development

The last estimation of R&D personnel and expenditures dates from 2006, during which around 750 researchers were active in R&D activities with an estimated budget of USD 55 million. This is equal to 0.22% of the country's GDP that year, a percentage comparable to the regional average (0.2%).[80]

4. Recommendations

Taking into account global and regional trends in technology and Lebanon's competitive advantages, we have identified a set of sub-sectors where Lebanon has a competitive edge in:

- Consumer Internet: More specifically in Web and Mobile Portals, Content Websites and Applications, News, Internet Publishing, Social Networks and Applications, and Search. There is an especially high demand for Arabic content creation along those key markets.
- Ad Tech: Particularly for Mobile, Search, and Video.
- Enterprise Software: The market is expected to grow at a CAGR of 10% from 2012 to 2015 in the MENA region. Opportunities are especially present in Customer Relationship Management, Government, and Advertising.
- Media Streaming: Online music and video revenues in MENA were estimated to grow at a CAGR of 60% from 2011 to 2014, providing opportunities for developers in Lebanon.
- Gaming: There are increased opportunities for gaming on tables and smartphones with more than 80% of the 1.2 billion gamers worldwide playing on tablets and smartphones.
- Value-Added Services (VAS): The increase in the number of mobile users and sale of smart devices, have created opportunities for VAS. Lebanon will have one of the highest growth rates of VAS revenues in the MENA region, which is expected to more than double by 2018.
- E-Government: With the implementation of the e-Government initiative, dawlati, Mobile devices will increasingly be used as key facilitator for online interactions.
- Telemarketing and Call Centers: Lebanon possesses a number of competitive advantages to serve this sector, including an internationally renowned educational system, cost-competitive and highly-skilled workforce, and an established track record

THE FOLLOWING TABLE WAS USED TO ASSESS THE ATTRACTIVENESS OF EACH OF THE SUB-SECTORS IN LEBANON:

Sophistication of local and regional customers	Refers to the presence of adequate processes/experience/staff/understanding to buy ICT products/services in Lebanon and the MENA region. Is a qualitative assessment, high, medium or low, based on desk research and interviews.
Ease of Exports	Refers to the availability of an export-friendly environment in Lebanon. Indicated as Yes or No.
Resilience to Instability in Lebanon	Refers to the sensitivity/elasticity of the sub-sector to political instability and insecurity in Lebanon. Is a qualitative assessment, high, medium or low, based on desk research and interviews.
Intensity of Local and Regional Competition	Refers to the degree of rivalry among firms, market concentration and quality of products/services in the sub-sector, in Lebanon and the MENA region. Is measured according to the number of operating firms in the sub-sector and their individual market share. Is a qualitative assessment, high, medium or low, based on desk research and interviews

Consumer Internet

Lebanon presents a competitive advantage for the development of consumer internet products, especially in three key markets:

- **Web and mobile portals, content websites and apps, news, internet publishing**
- **Social network and apps:** Lebanon is in the top five most active Arab countries across social media networks: 4th for Facebook, 6th for twitter and 5th for LinkedIn. 60 % of users are between the ages of 15 and 29.
- **Search:** In the Arab world, search is growing at around 25% each year. Search engine marketing is frequently used by marketers, with 56% of companies in the Middle East using search engine optimization (SEO) and 35% using pay-per-click (PPC).

Sophistication of local and regional customers	High
Ease of Exports	Yes
Resilience to Instability in Lebanon	High
Intensity of Local and Regional Competition	Medium

THERE IS AN ESPECIALLY HIGH DEMAND FOR ARABIC CONTENT CREATION ALONG THOSE THREE KEY MARKETS:
The number of active Arab Internet users is set to rise to 197 million by 2017[81]. According to recent estimates, 3 % of content in the Arab Region is actually in Arabic, whereas more than 60 % of users in the region tend to prefer Arabic content. 35% search mainly in Arabic, while 24% search mainly in English and only 19% always search in English. CNN recorded a 70% increase in unique users and visitors to its Arabic language portal, CNNArabic.com, during 2013. Al Jazeera, MSN Arabia and BBC Arabic are also driving growth in Arabic language news content. Internet giant Yahoo's Middle East portal, Yahoo Maktoob, overhauled both its Arabic and English content.

Demand for Arabic content still largely outweighs supply, thus indicating the potential for new products in the digital market. Players are still limited in this field and competition is minor with very new local producers at the moment, thus leaving room for new entrepreneurs to venture into new projects in this nascent industry. Lebanon's Arabic speaking population and talented Human Resources pool, presents a land of opportunities in this domain.

Shahiya.com is a successful Arab content portal founded in Lebanon. It is an Arabic food-focused social website. Millions of Arab home cooks use it to find, review and share recipes, food pictures and blog posts. Japan's Cookpad International is seeking to acquire the Lebanese company behind Shahiya, Netsila, for USD 13.5 million.

AdTech

In the MENA region, spending on digital advertising is increasing. Indeed, AdTech spending in the MENA was expected to expand by 47% (compared to a 13% global average) to reach USD 1.35 billion in 2013.[82] Spending is also expected to keep expanding by 37% from 2014 to 2017.[83] Lebanon leads advertising spending in the Levant, with USD 463 million in 2013, followed by Jordan with only USD 140 million in spending the same year.[84]

BIGGEST MARKETS FOR ADTECH:
Lebanon presents a competitive advantage for the development of Adtech products, especially in three key markets:
- **Mobile**: will become third-largest Internet advertising platform

- **Search**: will stay dominant with the largest share of total advertising revenue
- **Video**: will see the sharpest growth

Sophistication of local and regional customers	Medium
Ease of Exports	N/A
Resilience to Instability in Lebanon	High
Intensity of Local and Regional Competition	Low

Lebanon possesses the required infrastructure and human resources to give it a competitive advantage to serve this market. There are around 20 companies that work in this sector, which proves the availability of opportunities.

Software-as-a-Service

SaaS should be viewed as a new business model for the delivery of services, and gives Lebanese companies the possibility to overcome weak broadband infrastructure and install their servers abroad.

With the widespread use of Mobile Applications today, the mobile software industry has been rapidly growing. Lebanon is well positioned to serve this market supported by the presence of talented human resources. A regional approach and lower costs than more developed countries give Lebanon a strong competitive advantage. A number of Lebanese companies have proved their success in this space, while others are starting up, in spite of economic and political instability.

BIGGEST MARKETS FOR SAAS:

CRM - The growth of SaaS in the region is attributed to customer relationship management (CRM) usage, which was forecasted to grow by 49% in 2014 making it the highest growth sub-segment in SaaS. In addition, CRM will contribute 30% of all spending on SaaS in the region through 2018.[85] Cloud-based office suites and enterprise resource planning (ERP) solutions will also grow rapidly in the SaaS market.

Gartner predicts that from 2014 through 2018, USD 1.3 billion will be spent on business process as a service (BPaaS).[86] Growth in BPaaS will be slower than other segments, with spending projected to increase 8.1% through 2018.

Government - According to Gartner's 2014 predictions for government, by 2017, public cloud offerings will grow to account for more than 25% of government business services in domains other than national defense and security.[87] Cloud computing permits to uniformly cover the whole country with e-government solutions, independently of divergence of local administrative units that may be better or worse prepared to provide e-services.

Advertising - Cloud advertising is expected to continue as the single largest source of spending within the cloud services marketplace in MENA. The market is expected to grow from USD 56.6 billion in 2012 to USD 192 billion in 2016.[88]

Sophistication of local and regional customers	High
Ease of Exports	Yes
Resilience to Instability in Lebanon	High
Intensity of Local and Regional Competition	High

Media Streaming

- Online music and video revenues in the MENA are expected to grow at a considerable rate, providing opportunities for developers in Lebanon. Indeed, YouTube statistics place MENA as the second-highest regional consumer worldwide where 285 million videos are viewed every day and two hours of video are uploaded every minute.

Sophistication of local and regional customers	High
Ease of Exports	N/A
Resilience to Instability in Lebanon	High
Intensity of Local and Regional Competition	High

Lebanon possesses the required infrastructure and human resources to develop media streaming platforms.

Anghami is a new digital music app that offers listeners in the Middle East unlimited Arabic & International music to stream and download. The platform is bringing the Arab world its first mobile and web music streaming platform. Today, it is the #1 music app across application stores in the MENA with the largest catalog and around 3 Million users in less than 8 months- making it the most prominent music venture in the region. Anghami was awarded "Red Herring Asia Top100 Finalists award" in 2012. It announced that it would accept Bitcoin for its subscription fees, therefore becoming the first music service in the world to accept the digital currency and also one of the first online businesses in the region to do so.

Gaming

Digital game sales are set to rise at a CAGR of 29 % to reach USD 3.2 billion in 2016, owing to the young population of the Arab world that makes up about 60% of the total population.[89]

THE BIGGEST MARKETS FOR GAMING: There are increased opportunities for gaming on tables and smartphones. Indeed, 78% of all 1.2 billion gamers worldwide play on tablets and smartphones.

- Tablets: the sales of computers is falling at the profits of tablets which are expected to increase in sales from 11.8% in 2013 to 16.5% by 2017. Gaming on tablets is therefore also expected to grow at a 48% CAGR to reach USD 10 billion by 2016.
- Smartphones: smartphone penetration is increasing. Indeed, the number of smartphone sales will increase from 59.5% to 70.5% by 2017. Opportunities to develop gaming on smartphones will therefore increase. Indeed, gaming on smartphones is expected to grow at a 18.8% CAGR over the period 2012-2016.

Lebanon possesses the required framework that supports e-payment solutions, which allows the population to buy online games. The required broadband indicators are also met.

Sophistication of local and regional customers	High
Ease of Exports	N/A
Resilience to Instability in Lebanon	High
Intensity of Local and Regional Competition	High

Wixel Studios creates games on Apple and Android operating systems for the MENA region and was one of the first companies to appear on the Lebanese gaming scene. Wixel Studios currently develops mobile games and previously created online games on their website and developed online flash games localized for the Arab audience, in addition to famous advergames, and edugames. It has received investments from Berytech and Middle East Venture Partners (MEVP), which bought 37% of the company's shares.

VAS

The increase in the number of mobile users and sale of smart devices, as well as the amelioration of the speed of internet connection, have created opportunities for services that add value to standard telecom services offerings. Indeed, according to the study *Telecom in the Middle East: The Competitive Mandate After the Downturn* by Booz&co, "broadband users – both consumer and businesses – in the more developed markets of the Middle East are not just looking for a fast Internet connection, but also want to experience the many bandwidth-hungry applications and value-added services that are emerging. Applications such as videoconferencing, telepresence, telecommuting, and teleworking, all of which require high bandwidth, are starting to gain momentum in the region".

Moreover, the MENA region will be the second biggest region contributing to the increase in global mobile VAS revenues, with a CAGR of 12%[90]. Lebanon will especially have one of the highest growth rates in the region, significantly higher than the average of the region, with revenues expected to more than double by 2018[91].

There is an estimated 5 companies in Lebanon that employ around 356 people in this sector.

Sophistication of local and regional customers	High
Ease of Exports	N/A
Resilience to Instability in Lebanon	Low
Intensity of Local and Regional Competition	Medium

E-Government

Lebanon started its e-Government initiative, *dawlati*, with an implementation strategy spanning from 2013 to 2015.[92] Going forward Mobile devices will increasingly be used as key facilitator for these interactions.

Sophistication of local and regional customers	Low
Ease of Exports	N/A
Resilience to Instability in Lebanon	High
Intensity of Local and Regional Competition	Low

Telemarketing and Call Centers

Lebanon possesses a number of competitive advantages in this sector:

- Internationally renowned educational system: Lebanon ranks 28th worldwide for the Quality of its Educational System, and 5th worldwide for the quality of its Math and Sciences Education
- Cost-competitive & highly skilled workforce: Lebanon provides a pool of readily available, highly

skilled, and most importantly tri-lingual labor. This workforce is also highly competitive with labor prices nearly 40% less than in the GCC economies and nearly 50% lower than in selected developed economies

– Established track record: Lebanese call centers, as well as international call centers operating in Lebanon have accumulated a track record of international clients from various sectors including Samsung, Orange Telecom, Nestle, Toshiba and many others

– Enabling infrastructure: Lebanon is ranked 2nd in the region with regards to the digital access index. The DAI Index measures the overall ability of individuals in a country to access and use new ICT

– Supportive government: The government offers various types of support and guidance to companies involved in BPO activities. The Investment Development Authority of Lebanon (IDAL) offers information and facilitation while the Ministry of Telecommunications is highly active on the regulatory front and facilitates the issuance of licenses to call centers

Sophistication of local and regional customers	Low
Ease of Exports	Low
Resilience to Instability in Lebanon	No
Intensity of Local and Regional Competition	Low

The number of high end call centers in Lebanon is expected to reach 20 by end of 2013 and cover the world's largest consumer markets.

Appendix C: Higher Education Graduates in Lebanon

Data to this appendix was collected from the Ministry of Education & Higher Education of Lebanon. However, these number date from 2010, therefore, a 15% increase was added to each major.

	Total 2009-2010	15% increase
Engineering & IT		**15001.75**
Electrical Engineering	1508	1734.2
Electronic Engineering	713	819.95
Engineering Informatics	1553	1785.95
Computer programming and analysis	3486	4008.9
Wireless Communication Engineering	326	374.9
Electricity and Electronic	222	255.3
Engineering Informatics and electricity	9	10.35
Electronic Engineering Informatics	35	40.25
Computer and communications	3720	4278
Industrial Informatics	66	75.9
Electro technology	151	173.65
Mathematics and Informatics	735	845.25
Communications Engineering and Networks	182	209.3
Wired and wireless	54	62.1
Information technology	285	327.75
Mechanical Engineering	**2566**	**2950.9**
Business		**34276.9**
Economy of Communications and Technology	7	8.05
Business Administration	21272	24462.8
Economics and Management	1936	2226.4
Information management	2684	3086.6
Management	3565	4099.75
Management and Marketing	206	236.9
Engineering management	136	156.4
Accounting	3795	4364.25
Banking & Finance	3937	4527.55

Medical & Health Studies		**18538**
Medicine (General & Specific)		3107.3
General Medicine	1829	2103.35
Pharmacy	2871	3301.65
Nursing	1594	1833.1
Science Laboratory	1441	1657.15
Biology	2067	2377.05
Nutrition	5248	6035.2
Health	54	62.1
Medicine (specific)	873	1003.95
Management of health	136	156.4
Medical Engineering Technology	7	8.05
Psychology	**4251**	**4888.65**
Media, Advertising & Marketing		**5488.95**
Marketing & Advertising		**3013**
Advertising and communication	55	63.25
Media	123	141.45
Languages and communication	252	289.8
Public relations and advertising	514	591.1
Public relations	255	293.25
Advertising and design	872	1002.8
Marketing and Advertising	1179	1355.85
Press Radio and TV	844	970.6
Journalism	679	780.85
Literature		**19320**
Arabic	6453	7420.95
French	1947	2239.05
English	8400	9660
Education		**456.55**
Educational guidance	74	85.1
Educational Administration	323	371.45
Biotechnology		**7593.45**
Chemical Engineering	77	88.55
Biochemistry	308	354.2
Biology	2067	2377.05
Science Laboratory	1441	1657.15
Molecular Biology		9.2
Medicine (General & Specific)		3107.3

Works Cited

[1] BankMed – Market & Economic Research Division, *Analysis of Lebanon's ICT Sector*, June 2015. Web. 14 Jul. 2015.
<http://www.bankmed.com.lb/LinkClick.aspx?fileticket=WjhDOWAxOaw%3D&portalid=0>

[2] "Lebanon Information Technology Report." *Business Monitor International*. Business Monitor, 13 Dec. 2013. Web. 14 Aug. 2014. <http://store.businessmonitor.com/lebanon-information-technology-report.html#sthash.zmMOFfY3.dpuf>

[3] BankMed – Market & Economic Research Division, *Analysis of Lebanon's ICT Sector*, June 2015. Web. 14 Jul. 2015.
<http://www.bankmed.com.lb/LinkClick.aspx?fileticket=WjhDOWAxOaw%3D&portalid=0>

[4] "Lebanon Information Technology Report." *Business Monitor International*. Business Monitor, 27 Nov. 2014. Web. 14 Jul. 2015. <http://store.bmiresearch.com/lebanon-information-technology-report.html>

[5] "Lebanon Information Technology Report." *Business Monitor International*. Business Monitor, 13 Dec. 2013. Web. 14 Aug. 2014. <http://store.businessmonitor.com/lebanon-information-technology-report.html#sthash.zmMOFfY3.dpuf>

[6] Teltscher, Susan, Vanessa Gray, Esperanza Magpantay, Doris Olaya, and Ivan Vallejo. *Measuring the Information Society*. Rep. Geneva: International Telecommunication Union, 2013. *Measuring the Information Society*. International Telecommunication Union, 2013. Web. 22 Aug. 2014. <http://www.itu.int/en/ITU-D/Statistics/Documents/publications/mis2013/MIS2013_without_Annex_4.pdf>

[7] *Progress Report 2013*. Rep. Beirut: Ministry of Telecommunications, 2014. Print.

[8] Includes communications, computer, information and other services cover international telecommunications and postal and courier services , computer data, news-related service transactions between residents and non-residents

[9] "ICT Service Exports (% of Service Exports, BoP)." *Trade*. The World Bank, n.d. Web. 8 Sept. 2014. <http://data.worldbank.org/indicator/BX.GSR.CCIS.ZS/countries>.

[10] *Progress Report 2013*. Rep. Beirut: Ministry of Telecommunications, 2014. Print.

[11] Investment Development Authority of Lebanon database.

[12] Investment Development Authority of Lebanon database.

[13] Randa Akeel, *Supporting Innovation In Smes In Lebanon Through A Public/Private Equity Fund: The Isme Fund.* MENA Knowledge and Learning, quick notes series, Feb. 2013, Web. 10 Jul. 2015. < http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2013/02/28/000356161_20130228130052/Rendered/PDF/756580BRI0QN810Box374342B00PUBLIC0.pdf>

[14] Mishra, Pushpa. "Analysis: Middle East IT Spending Trends 2014."*Arabian Gazette*. Arabian Gazette, 4 Apr. 2014. Web. 21 Aug. 2014. <http://www.arabiangazette.com/analysis-middle-east-it-spending-trends-2014/>

[15] Gartner, Inc. *Gartner Says Middle East and Africa Enterprise IT Spending Will Grow 6.3 Percent In 2012*. *Gartner.* Gartner, Inc., 27 Feb. 2012. Web. 19 Aug. 2014. <http://www.gartner.com/newsroom/id/1933715>

[16] Madar Research & Development, Orient Planet. *Arab Knowledge Economy Report 2014*. Orient Planet, Web. 9 Jul. 2015. <http://www.orientplanet.com/akereport2014.pdf>

[17] Gartner, Inc. *Gartner Says Middle East IT Spending to Reach $211 Billion In 2014*. *Gartner.* Gartner, 1 Apr. 2014. Web. 16 Aug. 2014. <http://www.gartner.com/newsroom/id/2696917>.

[18] Gartner, Inc. *Gartner Says Middle East IT Spending to Reach $211 Billion In 2014*. *Gartner.* Gartner, 1 Apr. 2014. Web. 16 Aug. 2014. <http://www.gartner.com/newsroom/id/2696917>.

[19] Gartner, Inc. *Gartner Says Middle East IT Spending to Reach $211 Billion In 2014*. *Gartner.* Gartner, 1 Apr. 2014. Web. 16 Aug. 2014. <http://www.gartner.com/newsroom/id/2696917>.

[20] Gartner, Inc. *Gartner Says Middle East IT Spending to Reach $211 Billion In 2014*. *Gartner.* Gartner, 1 Apr. 2014. Web. 16 Aug. 2014. <http://www.gartner.com/newsroom/id/2696917>.

[21] Kable. Market Research. *Market Opportunity Forecasts to 2018: Software Infrastructure*. *Researchmoz*. Researchmoz, 10 Apr. 2014. Web. 19 Sept. 2014. <http://www.researchmoz.us/kables-market-opportunity-forecasts-to-2018-software-infrastructure-report.html>.

[22] Kable. Market Research. *Market Opportunity Forecasts to 2018: Software Infrastructure*. *Researchmoz*. Researchmoz, 10 Apr. 2014. Web. 19 Sept. 2014. <http://www.researchmoz.us/kables-market-opportunity-forecasts-to-2018-software-infrastructure-report.html>.

[23] Press, Gil. "$16.1 Billion Big Data Market: 2014 Predictions From IDC And IIA." *Forbes*. Forbes, 12 Dec. 2013. Web. 19 Sept. 2014. <http://www.forbes.com/sites/gilpress/2013/12/12/16-1-billion-big-data-market-2014-predictions-from-idc-and-iia/>.

[24] MarketsandMarkets. *Government Cloud Market worth $18.48 Billion By 2018*. *MarketsandMarkets*. MarketsandMarkets, n.d. Web. 19 Sept. 2014. <http://www.marketsandmarkets.com/PressReleases/government-cloud.asp>.

Global Software-defined Networking Market 2014-2018.*TechNavio*. TechNavio, 10 Jan. 2014. Web. 19 Sept. 2014. <http://www.technavio.com/report/global-software-defined-networking-market-2014-2018>.

MarketsandMarkets. *Services: Largest Segment for Big Data*. *MarketsandMarkets*. MarketsandMarkets, n.d. Web. 19 Sept. 2014. <http://www.marketsandmarkets.com/ResearchInsight/big-data.asp>.

[25] *Data Center Infrastructure Support Services Market in the GCC 2014-2018*. Rep. ReportsnReports, July 2014. Web. 24 Sept. 2014. <http://www.reportsnreports.com/reports/292848-data-center-infrastructure-support-services-market-in-the-gcc-2014-2018.html>.

Gartner, Inc. *Gartner Says Master Data Management Software Revenue to Grow 21 Percent in 2012*. *Gartner*. Gartner, Inc., 3 Jan. 2012. Web. 24 Sept. 2014. <http://www.gartner.com/newsroom/id/1886314>.

IDC Forecasts Worldwide Public IT Cloud Services Spending to Reach Nearly $108 Billion by 2017 as Focus Shifts from Savings to Innovation. *IDC*. International Data Corporation, 3 Sept. 2014. Web. 19 Sept. 2014. <http://www.idc.com/getdoc.jsp?containerId=prUS24298013>.

Kable. Market Research. *Market Opportunity Forecasts to 2018: Software Infrastructure*. *Researchmoz*. Researchmoz, 10 Apr. 2014. Web. 19 Sept. 2014. <http://www.researchmoz.us/kables-market-opportunity-forecasts-to-2018-software-infrastructure-report.html>.

Macmahon, Sandra. *Global Security Analytics Market 2014-2018*. Rep. Sandler Research, Feb. 2014. Web. 24 Sept. 2014. <http://www.sandlerresearch.org/global-security-analytics-market-2014-2018.html>.

MarketsandMarkets. *Government Cloud Market worth $18.48 Billion By 2018*. *MarketsandMarkets*. MarketsandMarkets, n.d. Web. 19 Sept. 2014. <http://www.marketsandmarkets.com/PressReleases/government-cloud.asp>.

MarketsandMarkets. *Services: Largest Segment for Big Data*. *MarketsandMarkets*. MarketsandMarkets, n.d. Web. 19 Sept. 2014. <http://www.marketsandmarkets.com/ResearchInsight/big-data.asp>.

Press, Gil. "$16.1 Billion Big Data Market: 2014 Predictions From IDC And IIA." *Forbes*. Forbes, 12 Dec. 2013. Web. 19 Sept. 2014. <http://www.forbes.com/sites/gilpress/2013/12/12/16-1-billion-big-data-market-2014-predictions-from-idc-and-iia/>.

ReportsnReports, Mobile/Micro Data Center Market by Applications (Instant & Retrofit, Disaster Recovery, High Density Networks, Remote Office, Mobile Computing), Rack Size, Organization Size and Verticals - Global Advancements, Worldwide Forecast & Analysis (2014-2019)

TechNavio. Global Data Center Market to Increase at 10.7% CAGR through 2016, Says TechNavio. TechNavio. TechNavio, 23 June 2013. Web. 24 Sept. 2014. <http://www.technavio.com/news/global-data-center-market-increase-107-cagr-through-2016-says-technavio>.

Global Software-defined Networking Market 2014-2018.*TechNavio*. TechNavio, 10 Jan. 2014. Web. 19 Sept. 2014. <http://www.technavio.com/report/global-software-defined-networking-market-2014-2018>.

United Nations Conference on Trade and Development. *In Formation Economy Report 2013*. Rep. United Nations, 2013. Web. 19 Sept. 2014. <http://unctad.org/en/PublicationsLibrary/ier2013_en.pdf>.

[26] Gartner, Inc. *Gartner Says Cloud Services Market In The Middle East And Northern Africa Region To Reach $462.3 Million in 2013*. *Gartner*. Gartner, Inc., 11 Feb. 2013. Web. 19 Sept. 2014. <http://www.gartner.com/newsroom/id/2333517>.

[27] Gartner, Inc. *Gartner Says Public Cloud Services in the Middle East and North Africa Region on Pace To Grow 23 Percent In 2014*. *Gartner*. Gartner, Inc., 29 Apr. 2014. Web. 18 Sept. 2014. <http://www.gartner.com/newsroom/id/2724117>

[28] *Forecast Analysis: Enterprise Application Software, Worldwide, 1Q14 Update*. Rep. Gartner, Inc., 29 Apr. 2014. Web. 1 Aug. 2014. <https://www.gartner.com/doc/2724818?ref=unauthreader>.

[29] *Business Process Management (BPM), Cloud, Mobile, and Patterns Market Shares, Strategies, and Forecasts, Worldwide, 2014-2020*. Rep. Reaserchandmarkets, June 2014. Web. 24 Sept. 2014. <http://www.researchandmarkets.com/reports/2857915/business-process-management-bpm-cloud-mobile>.

Enterprise Asset Management Market by Software Applications (Linear Assets, Non-Linear Assets, Field Service Management, Assets MRO) by Services (Implementation, Managed Services, Training & Support) - Worldwide Forecasts and Analysis (2014-2019). Rep. MarketsandMarkets, July 2014. Web. 24 Sept. 2014. <http://www.marketsandmarkets.com/Market-Reports/enterprise-asset-management-market-54576143.html>.

Enterprise Collaboration Market [Solutions (Telephony, Unified Messaging, Conferencing, Collaboration Platforms, Enterprise Social), Services, Deployment, User Types (SME, Enterprises)] - Global Advancements, Worldwide Forecasts & Analysis (2014 - 2019). Rep. MarketsandMarkets, Mar. 2014. Web. 24 Sept. 2014. <http://www.marketsandmarkets.com/Market-Reports/enterprise-collaboration-market-130299553.html>.

Enterprise Content Management Market (Big Data, Document Management, Web Content Management, Digital Rights Management, Rich Media, Social Media Management, Enterprise Mobility, Data Records, Data Deliver) - Worldwide Forecasts & Analysis (2014 - 2019). Rep. MarketsandMarkets, Apr. 2014. Web. 24 Sept. 2014. <http://www.marketsandmarkets.com/Market-Reports/enterprise-content-management-market-226977096.html>.

Forecast Analysis: Enterprise Application Software, Worldwide, 1Q14 Update. Rep. Gartner, Inc., 29 Apr. 2014. Web. 1 Aug. 2014. <https://www.gartner.com/doc/2724818?ref=unauthreader>.

Global Enterprise Resource Planning (ERP) Market 2014-2018. Rep. ReportsnReports, May 2014. Web. 24 Sept. 2014. <http://www.reportsnreports.com/reports/287992-global-enterprise-resource-planning-erp-market-2014-2018.html>.

Global Enterprise Search Market 2014-2018. Rep. Sandler Research, July 2014. Web. 24 Sept. 2014. . Rep. MicroMarketMonitor, n.d. Web. 24 Sept. 2014. <http://www.micromarketmonitor.com/market-report/enterprise-collaboration-reports-5173070438.html>.

Global Enterprise Search Market 2014-2018. Rep. Sandler Research, July 2014. Web. 24 Sept. 2014. <http://www.sandlerresearch.org/global-enterprise-search-market-2014-2018.html>.

Global IT Asset Management Software Market 2014-2018. Rep. TechNavio, 30 July 2014. Web. 24 Sept. 2014. <http://www.technavio.com/report/global-it-asset-management-software-market-2014-2018>.

Market Share Analysis: ERP Software, Worldwide, 2012. Rep. Gartner, Inc., 7 May 2013. Web. 24 Sept. 2014. <https://www.gartner.com/doc/2477517/market-share-analysis-erp-software>.

MarketsandMarkets. *Business Intelligence Market Grow at an Estimated CAGR of 8.3% from 2013 to 2018*. *MarketsandMarkets*. MarketsandMarkets, n.d. Web. 24 Sept. 2014. <http://www.marketsandmarkets.com/ResearchInsight/business-intelligence-market.asp>.

[30] Gartner, Inc. *Gartner Says Public Cloud Services in the Middle East and North Africa Region on Pace To Grow 23 Percent In 2014*. *Gartner*. Gartner, Inc., 29 Apr. 2014. Web. 18 Sept. 2014. <http://www.gartner.com/newsroom/id/2724117>

[31] *Cisco Global Cloud Index: Forecast and Methodology, 2012–2017*. Rep. Cisco Public., 2013. Web. 19 Sept. 2014. <http://www.cisco.com/c/en/us/solutions/collateral/service-provider/global-cloud-index-gci/Cloud_Index_White_Paper.html>.

[32] Gartner, Inc. *Gartner Says Public Cloud Services in the Middle East and North Africa Region on Pace To Grow 23 Percent In 2014*. *Gartner*. Gartner, Inc., 29 Apr. 2014. Web. 18 Sept. 2014. <http://www.gartner.com/newsroom/id/2724117>

[33] *Cisco Global Cloud Index: Forecast and Methodology, 2012–2017*. Rep. Cisco Public., 2013. Web. 19 Sept. 2014. <http://www.cisco.com/c/en/us/solutions/collateral/service-provider/global-cloud-index-gci/Cloud_Index_White_Paper.html>.

[34] Gartner, Inc. *Gartner Says Middle East and Africa Enterprise IT Spending Will Grow 6.3 Percent In 2012*. *Gartner.* Gartner, Inc., 27 Feb. 2012. Web. 19 Aug. 2014. <http://www.gartner.com/newsroom/id/1933715>

[35] Nuviun. Nuviun Digital Health. *MENA Healthcare Market Worth $144 Billion by 2020*. *Nuviun*. Nuviun, 21 Mar. 2014. Web. 18 Sept. 2014. <http://nuviun.com/content/news/mena-healthcare-market-worth-144-billion-dollars-by-2020>.

[36] Singh, Jayant. "Investing in Healthcare." *Trade and Export Middle East*. Trade and Export Middle East, 14 Apr. 2014. Web. 18 Sept. 2014. <http://www.tradeandexportme.com/2014/04/investing-in-healthcare/>.

[37] *Technology, Media & Telecommunications Predictions 2014 Middle East*. Rep. Deloitte & Touche (M.E.), 2014. Web. 18 Sept. 2014. <http://www.deloitte.com/assets/Dcom-MiddleEast/Local%20Assets/Documents/Industries/TMT/ME%20TMT%20Predictions%202014/TMT%20predictions%202014%20ME%20final%20version.pdf>.

[38] *Technology, Media & Telecommunications Predictions 2014 Middle East*. Rep. Deloitte & Touche (M.E.), 2014. Web. 18 Sept. 2014. <http://www.deloitte.com/assets/Dcom-MiddleEast/Local%20Assets/Documents/Industries/TMT/ME%20TMT%20Predictions%202014/TMT%20predictions%202014%20ME%20final%20version.pdf>.

[39] *Technology, Media & Telecommunications Predictions 2014 Middle East*. Rep. Deloitte & Touche (M.E.), 2014. Web. 18 Sept. 2014. <http://www.deloitte.com/assets/Dcom-MiddleEast/Local%20Assets/Documents/Industries/TMT/ME%20TMT%20Predictions%202014/TMT%20predictions%202014%20ME%20final%20version.pdf>.

[40] IbisWorld, Global Biotechnology: Market Research Report. IbisWorld, Jan. 2015. Web. 10 Jul. 2015. < http://www.ibisworld.com/industry/global/global-biotechnology.html>

[41] Grand View Research, *Biotechnology Market (Biopharmacy, Bioservices, Bioagriculture, Bioindustrial, Fermentation, DNA sequencing, Tissue Engineering, Regeneration) Analysis And*

Segment Forecasts To 2020. Grand View Research, May 2014. Web. 10 Jul. 2015. <
http://www.grandviewresearch.com/industry-analysis/biotechnology-market>

[42] Xin Song, *Biotechnology: Industry Analysis, Key Players & Future Trends*. Datafox Intelligence, Inc., 23 Mar. 2014. Web. 10 Jul. 2015. < http://www.datafox.co/blog/2014/03/biotechnology-industry-analysis-key-players-future-trends/>

[43] Kermani, Dr. Faiz. "A Quick Guide™ to Healthcare and Biotechnology in the Middle East." Introduction. *A Quick Guide to Biotechnology and Healthcare in the Middle East*. 1st ed. N.p.: BioPlan Associates, 2009. N. pag. *BioPlan Associates*. BioPlan Associates, Inc., 30 Apr. 2009. Web. 18 Sept. 2014. <http://www.bioplanassociates.com/quickguides/QGME.htm>.

[44] Telecompaper. Tp:news. *Number of E-government Services Users to Triple by 2016*. Telecompaper. ABI Research, 3 Sept. 2011. Web. 29 Sept. 2014. <http://www.telecompaper.com/news/number-of-e-government-services-users-to-triple-by-2016--824728>.

[45] Gartner, Inc. *Gartner Reveals Its 2014 Predictions for Government*. Gartner. Gartner, Inc., 17 Dec. 2013. Web. 30 Sept. 2014. <http://www.gartner.com/newsroom/id/2638115>.

[46] Baghdadi, Alexis. *Deloitte Predicts the MENA Will Be ICT's Eldorado in 2015*. ArabNet, 17 Apr. 2015. Web. 5 Aug. 2015. < http://news.arabnet.me/deloitte-predictions-mena-ict-3d-printing-smart-cities-2015/>

[47] Middle East Business News and Information. *GCC Governments Ramp up E-government Services*. *Mid East Info*. Dubai World Trade Centre (DWTC, GITEX Technology Week, IT & Telecom, 3 Oct. 2013. Web. 1 Sept. 2014. <http://mid-east.info/gcc-governments-ramp-up-e-government-services-11392/>.

[48] Gartner, Inc. *Gartner Says Worldwide Mobile Payment Transaction Value to Surpass $235 Billion in 2013*. *Gartner*. Gartner, Inc., 294 June 2013. Web. 18 Sept. 2014. <http://www.gartner.com/newsroom/id/2504915>.

[49] Hamid, Triska. "Gulf Telcos Race to Get Slice of Mobile Money Market." *The National* (2013): n. pag. 8 Sept. 2013. Web. 1 Sept. 2014. <http://www.thenational.ae/business/industry-insights/technology/gulf-telcos-race-to-get-slice-of-mobile-money-market#ixzz3C360XEJW>.

[50] Shotter, Emily. "Ooredoo Announces Support for Global Mobile Money Initiative -." *AME Info*. Ishraq Al Tal, 6 May 2014. Web. 18 Sept. 2014. <http://ameinfo.com/blog/company-news/o/ooredoo/ooredoo-announces-support-global-mobile-money-initiative-2/>.

[51] "Online Banking in the GCC." *AT Kearney*. AT Kearney, n.d. Web. 18 Sept. 2014. <http://www.atkearney.com/web/digital-business-forum/detail/-/asset_publisher/VMEx2L1PhjPS/content/online-banking-in-the-gcc/10192>.

[52] *Global E-commerce Market 2014-2018.* Rep. TechNavio, 7 Feb. 2014. Web. 29 Sept. 2014. <http://www.technavio.com/report/global-e-commerce-market-2014-2018>.

[53] *Global B2C Ecommerce Sales to Hit $1.5 Trillion This Year Driven by Growth in Emerging* Markets. EMarketer. EMarketer, 3 Feb. 2014. Web. 29 Sept. 2014. <http://www.emarketer.com/Article/Global-B2C-Ecommerce-Sales-Hit-15-Trillion-This-Year-Driven-by-Growth-Emerging-Markets/1010575>.

[54] *PayPal Insights: E-commerce in the Middle East 2012-2015*. Rep. PayPal, Sept. 2013. Web. 18 Sept. 2014. <https://www.paypal-mena.com/hu/mobile-insights/pdf/PayPal-Insights-E-commerce-MiddleEast-2012-2015.pdf>.

[55] Siu, Eric. "24 Eye-Popping SEO Statistics." *Search Engine Journal*. Search Engine Journal, 19 Apr. 2012. Web. 19 Sept. 2014. <http://www.searchenginejournal.com/24-eye-popping-seo-statistics/42665/>.

[56] *Middle East State of Digital 2014*. Rep. Serviceplan Middle East, 27 June 2014. Web. 18 Sept. 2014. <http://www.slideshare.net/morellimarc/middle-east-state-of-digital-2014>.

[57] *Middle East State of Digital 2014*. Rep. Serviceplan Middle East, 27 June 2014. Web. 18 Sept. 2014. <http://www.slideshare.net/morellimarc/middle-east-state-of-digital-2014>.

[58] PWC. Global Entertainment and Media Outlook 2014-2018. *Internet Advertising.* PWC. PWC, 2014. Web. 29 Sept. 2014. <http://www.pwc.com/gx/en/global-entertainment-media-outlook/segment-insights/internet-advertising.jhtml>.

[59] PWC. Global Entertainment and Media Outlook 2014-2018. *Internet Advertising.* PWC. PWC, 2014. Web. 29 Sept. 2014. <http://www.pwc.com/gx/en/global-entertainment-media-outlook/segment-insights/internet-advertising.jhtml>.

[60] PWC. Global Entertainment and Media Outlook 2014-2018. *Internet Advertising.* PWC. PWC, 2014. Web. 29 Sept. 2014. <http://www.pwc.com/gx/en/global-entertainment-media-outlook/segment-insights/internet-advertising.jhtml>.

[62] PWC. Global Entertainment and Media Outlook 2014-2018. *Seizing the Initiative: As Growth Goes Digital, Advertising Spearheads the Migration*. PWC. PWC, 2014. Web. 29 Sept. 2014. <http://www.pwc.com/gx/en/global-entertainment-media-outlook/data-insights.jhtml>.

[63] BA, Bocar A. "Mobile Data: The Most Important Revenue Growth Prospect for Telcos in the SAMENA Region." *A SAMENA Telecommunications Council Newsletter* 4 (Sept.-Oct. 2013): 1. *SAMENA Trends*. Web. 19 Sept. 2014. <http://www.samenacouncil.org/samena_trends/files/SAMENA_TRENDS_SEP-OCT-2013.pdf>.

[64] *Towards The Global Games Market in 2017*. Rep. Casual Games Association and Newzoo, June 2014. Web. 29 Sept. 2014. <http://issuu.com/casualconnect/docs/ccnewzoospringreport-pages>.

[65] Newzoo. News. *Global Games Market Grows to $86.1bn in 2016.* Newzoo. Newzoo, 6 Jan. 2013. Web. 29 Sept. 2014. <http://www.newzoo.com/press-releases/global-games-market-grows-to-86-1bn-in-2016/>.

[66] Flanagan, Ben. "Digital Games Play Well in the Middle East | The National."*Digital Games Play Well in the Middle East*. The National, 11 Nov. 2011. Web. 19 Sept. 2014. <http://www.thenational.ae/business/industry-insights/technology/digital-games-play-well-in-the-middle-east>.

[67] Tennery, Amy. "The Middle East Has One of the Fastest Growing Communities of Online Gamers." *Reuters* (n.d.): n. pag. *Reuters*. Web. 19 Sept. 2014. <http://reuters.tumblr.com/post/19302126964/the-middle-east-has-one-of-the-fastest-growing>.

[68] *Global E-learning Market 2014-2018*. Rep. TechNavio, 17 Jan. 2014. Web. 29 Sept. 2014. <http://www.technavio.com/report/global-e-learning-market-2014-2018>.

[69] *E-Learning Market Trends & Forecast 2014 - 2016 Report*. Rep. Docebo, Mar. 2014. Web. 19 Sept. 2014. <http://www.docebo.com/landing/contactform/elearning-market-trends-and-forecast-2014-2016-docebo-report.pdf>.

[70] *E-Learning Market Trends & Forecast 2014 - 2016 Report*. Rep. Docebo, Mar. 2014. Web. 19 Sept. 2014. <http://www.docebo.com/landing/contactform/elearning-market-trends-and-forecast-2014-2016-docebo-report.pdf>.

[71] *Technology, Media & Telecommunications Predictions 2014 Middle East*. Rep. Deloitte & Touche (M.E.), 2014. Web. 18 Sept. 2014. <http://www.deloitte.com/assets/Dcom-MiddleEast/Local%20Assets/Documents/Industries/TMT/ME%20TMT%20Predictions%202014/TMT%20predictions%202014%20ME%20final%20version.pdf>.

[72] Qanawat. News. *Qanawat Opens First Office in Saudi Arabia*. *Qanawat*. Qanawat, 9 Jan. 2012. Web. 19 Sept. 2014. <http://www.qanawat-me.com/en/news/>.

[73] *Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2013–2018*. Rep. Cisco Public., 5. Feb. 2014. Web. 19 Sept. 2014. < http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white_paper_c11-520862.html>.

[74] *Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2013–2018*. Rep. Cisco Public., 5. Feb. 2014. Web. 19 Sept. 2014. < http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white_paper_c11-520862.html>.

[75] The Global Innovation Index 2014: The Human Factor in Innovation. Rep. Cornell University, INSEAD, and the World Intellectual Property Organization (WIPO), 2014. Web. 26 Sept. 2014. <https://www.globalinnovationindex.org/userfiles/file/reportpdf/GII-2014-v5.pdf>.

[76] International Telecommunication Union, *2005-2015 ICT data for the world*. Web. 10 Jul. 2015. < http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx>

[77] "Number of Internet Users at 3.2 Million in 2017, Internet Penetration to Reach 69%." Lebanon This Week 357 (2 June 2014): 3. Byblos Bank Publications. Web. 26 Sept. 2014. <http://www.byblosbank.com.lb/Library/Files/Lebanon/Publications/Economic%20Research/Lebanon%20This%20Week/Lebanon%20This%20Week_357.pdf>.

[78] "Cisco Global Cloud Index Supplement: Cloud Readiness Regional Details." *Cisco*. Cisco Public, Oct. 2013. Web. 24 Sept. 2014. <http://www.cisco.com/c/en/us/solutions/collateral/service-provider/global-cloud-index-gci/CloudIndex_Supplement.html>.

[79] "Number of Internet Users at 3.2 Million in 2017, Internet Penetration to Reach 69%." Lebanon This Week 357 (2 June 2014): 3. Byblos Bank Publications. Web. 26 Sept. 2014. <http://www.byblosbank.com.lb/Library/Files/Lebanon/Publications/Economic%20Research/Lebanon%20This%20Week/Lebanon%20This%20Week_357.pdf>.

[80] *OECD Science, Technology and Industry Scoreboard 2011*. Rep. 10th ed. Paris: OECD, 2011. OECD Publishing, 20 Sept. 2011. Web. 24 Sept. 2014. <http://www.oecd-

ilibrary.org/docserver/download/9211041e.pdf?expires=1411561062&id=id&accname=guest&check sum=D4149A84613BFF551F9129167C8E6339>.

[81] Madar Research & Development, Orient Planet. *Arab Knowledge Economy Report 2014*. Orient Planet, Web. 9 Jul. 2015. <http://www.orientplanet.com/akereport2014.pdf>

[82] *The Global Media Intelligence Report: Middle East & Africa, 2013"* Rep. EMarketer, 2013. Web. 19 Sept. 2014. <https://www.emarketer.com/coverage/middleeastafrica>.

[83] "Online Ad Spend to Hit $1bn in Mena." *TradeArabia*. TradeArabia News Service, 30 Jan. 2014. Web. 19 Sept. 2014. <http://www.tradearabia.com/news/MEDIA_251016.html>.

[84] "Online Ad Spend to Hit $1bn in Mena." *TradeArabia*. TradeArabia News Service, 30 Jan. 2014. Web. 19 Sept. 2014. <http://www.tradearabia.com/news/MEDIA_251016.html>.

[85] Gartner, Inc. *Gartner Says Public Cloud Services in the Middle East and North Africa Region on Pace To Grow 23 Percent In 2014*. *Gartner*. Gartner, Inc., 29 Apr. 2014. Web. 18 Sept. 2014. <http://www.gartner.com/newsroom/id/2724117>

[86] Gartner, Inc. *Gartner Says Public Cloud Services in the Middle East and North Africa Region on Pace To Grow 23 Percent In 2014*. *Gartner*. Gartner, Inc., 29 Apr. 2014. Web. 18 Sept. 2014. <http://www.gartner.com/newsroom/id/2724117>

[87] Gartner, Inc. *Gartner Reveals Its 2014 Predictions for Government*. Gartner. Gartner, Inc., 17 Dec. 2013. Web. 26 Sept. 2014. <http://www.gartner.com/newsroom/id/2638115>.

[88] Gartner, Inc. *Gartner Says Cloud Services Market In The Middle East And Northern Africa Region To Reach $462.3 Million in 2013*. *Gartner*. Gartner, Inc., 11 Feb. 2013. Web. 19 Sept. 2014. <http://www.gartner.com/newsroom/id/2333517>.

[89] Flanagan, Ben. "Digital Games Play Well in the Middle East | The National."*Digital Games Play Well in the Middle East*. The National, 11 Nov. 2011. Web. 19 Sept. 2014. <http://www.thenational.ae/business/industry-insights/technology/digital-games-play-well-in-the-middle-east>.

[90] Field, Roger. Mobile VAS to grow 10% a year to 2018. 13 Oct. 2013. Web. 22 Jun. 2015. <http://www.itp.net/595265-mobile-vas-to-grow-10-a-year-to-2018>.

[91] Field, Roger. Mobile VAS to grow 10% a year to 2018. 13 Oct. 2013. Web. 22 Jun. 2015. <http://www.itp.net/595265-mobile-vas-to-grow-10-a-year-to-2018>.

[92] Ataya, Ali. *Lebanese E-Government*. Office of the Minister of State for Administrative Reform, Head of the E-Government Unit, 5 Dec. 2013. Web. 24 Sept. 2014. <http://css.escwa.org.lb/ICTD/3233/13p4.pdf>.