Jordan National Information and Communications Technology Strategy

(2013-2017)

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Executive Summary

Jordan has traditionally been a regional leader in developing, adopting and utilizing information and communication technology (ICT). In recent decades, Jordan's lead has decreased over regional economies. Since Jordan is a resource poor economy and economic activity has historically been greatly based on international donors it is important for Jordan to develop independent economic competitiveness to reduce/eliminate its dependence on external donor funding. In the particular case of Jordan this can only be done through the talent, creativity and education/skill of its population.

The purpose of this strategy is to provide Jordan with a defined strategy for addressing areas of specific weakness and opportunity for the purpose of improving the role of ICT in Jordan's economic development and job creation. Robust economic development and job creation must be linked with exports. The strategy is designed to be aligned with the Government of Jordan's Policy in the Telecommunications and IT Sectors in its recommendations.. This document consists of a five year strategic plan for the telecommunications and information technology sectors. It has been prepared in full partnership with the private sector. The plan should be reviewed and revised biannually.

ICT provides a powerful paradigm for economic development. Telecommunications infrastructure is the means through which information technology products and services are delivered to consumers (for local consumption and exports). As such, telecommunications and information technology are inextricably intertwined. Therefore, an essential component to a healthy and sustainably competitive IT sector is a robust, modern, responsive and competitive telecommunications infrastructure. Without proper telecommunications infrastructure, IT products and services cannot be delivered locally or internationally as exports. High value added job creation is thus connected not only to the competitiveness of the actual IT sector but also to the importance of a modern telecommunications infrastructure. The economic benefits of information technology cannot be delivered to the economy and society without fast and competitive telecommunications. It is for this reason that this document addresses both telecommunications and information technology.

ICT has evolved into an internationally known language/standard. A competent ICT professional in Jordan can develop products and services which can be implemented in and have value in global markets. It is this opportunity which is afforded by ICT which makes it imperative for Jordan to take as much advantage of this opportunity. Being able to take full advantage of this opportunity requires that the business environment be competitive with international economies. It is only in this manner that structural impediments can be removed allowing Jordan's ability to compete to rest on the abilities of its people.

As such, it is important that ICT infrastructure be continually maintained at the levels found in competing economies. Infrastructure provides a platform for new product and service development and innovation. Without infrastructure at international standards, the ICT industry will be handicapped. Many ICT companies may be developing products/services based on obsolete infrastructure which will not find an application outside of Jordan. These issues and challenges are avoidable as exports are required to mitigate Jordan's chronic trade deficit. This strategy attempts to provide simple and practical recommendations to improve IT, ICT enabled and digital content companies' exports as a means of increasing the sector's contribution to the national economy and to provide job creation opportunities.

Since the government of Jordan (GoJ) also suffers from a chronic budget deficit, it is imperative that creative means be pursued to overcome the government's inability to finance infrastructure development. As such, the GoJ needs to develop/promote modalities (BOO, BOT, BOOST, Joint Ventures, etc.) in which private sector investment can be recruited to continually upgrade ICT infrastructure and various required E-services. This will require that Public Private Partnerships (PPPs) be developed or negotiated and that commercial partnership and licensing models be identified and agreed upon and promoted to upgrade national telecommunication infrastructure to remain competitive with global norms.

ICT is a knowledge based industry. As such, education, training and certification play an important role in determining sustainable competitiveness and longevity. Jordan already is well known for its university system. However, the university system is not agile enough to remain completely relevant with the demands of the ICT sector. The ICT sector needs to develop means in which ICT graduates can continually develop their skills to remain relevant for local ICT companies and to develop competitive products. Training and certification can be done through an independent professional development institute or cooperative existing training and educational institutions in cooperation with international technology providers and international operators. The benchmark of a knowledge base industry is the industry's ability to develop intellectual property. This strategy has provided a variety of recommendations regarding IP. The strategy promotes identifying existing but unregistered/unidentified/unrecognized intellectual property concealed in existing ICT products and services and promotes registering them. It also aims to encourage local ICT companies to develop, register and promote and commercialize their own IP.

Finally, the strategy covers the issue of ICT diffusion as a necessary requirement for economic growth. The strategy explicitly calls for developing intersections between the ICT sector and competitive economic sectors like pharmaceuticals, Architecture and Engineering and Clean Technology to identify issues which can be effectively addressed by ICT to improve the competitiveness of the individual sectors. It is through the effective intersection of ICT and the individual sectors that diffusion will be facilitated. Diffusion will be facilitated because developed ICT products and services will have obvious utility to the sectors.

Overview

Jordan was one of the first Arab countries to introduce communication and information technology to the economy. In 1921 the Department of Post and Telegraph (DPT) was set up. It provided telegraph and post services to Trans Jordan Emirate In 1930, telecom services were further developed as well as international links. The Ministry of Post, Telegraph and Telephony (MoPTT) was established in 1951 as the successor of the DPT. It was responsible for providing, improving and expanding the coverage of post and national telephone services across the Kingdom. In 1971, the Telecommunications Corporation (TCC) was established as a Government controlled entity responsible for the provision of various telecom services, including telephone, telegraph and telex and for regulating them [1].

Jordan developed satellite communication links in the late 1970s and mobile telephone service (MTS) in the mid-1980s. International direct dialing was introduced in 1982; in 1989, Jordan had one Atlantic Ocean International Telecommunications Satellite Organization (INTELSAT) channel, one Indian Ocean INTELSAT channel, and one Arab Satellite Organization (ARABSAT) channel[2].

Jordan was also one of the first Arab countries to introduce information technology (IT) to industry and the economy. The General Statistics Department installed the first mainframe in 1968 followed by Cairo Amman Bank in 1969 and the Royal Scientific Society (RSS) installed a mainframe in the early 1970s. The RSS was also outsourced to do customer billing for the Jordan Electricity Authority (JEA) and the Jordan Telecommunications Corporation (TCC) in the 1970s and 1980s. By the late 1980s banks and large industrial institutions (Phosphate and Potash) had computerized systems and IT departments. In the late 1980s, the national IT industry seriously developing due to the advent of affordable and powerful personal desktop computers and an increasing number of IT graduates.

Technical development and growth of the ICT industry was further enhanced by privatization and liberalization of the telecommunications sector according to the timeline included in Annex 1.

The Jordanian ICT sector has grown tremendously since the late 1980s and early 1990s,. In the late 1990s, the Information Technology Association of Jordan (INT@J) was formed. INT@J Played a crucial role in developing a series of national strategies (REACH 1.0, 2.0, 3.0, etc.) and the last national strategy was developed by the sector in cooperation with the Ministry of ICT. INT@J was the first institution to start gathering meaningful sector specific data. As such, much of what is in this report is based on data gathered and collated by INT@J. Since the establishment of MoICT in 2002, the ministry became more involved and enhanced cooperation within the ICT sector by getting all relevant players involved and by leading the collective development of sector policies. The ICT sector grew in response to liberalization of telecommunications..

The sector's initial reform requests were centered on deregulating the industry, lowering internet usage costs and getting the government to lead sector development trough initiating E-education and E-government. The E-Education initiative created an ICT subsector with export

[1] http://www.trc.gov.jo/index.php?option=com_content&task=view&id=337&itemid=507&lang=english

[2] http://www.mongabay.com/history/jordan/jordan-telecommunications.html

potential. Three local E-education companies developed Arabic language based E-education content, E-Education content management systems and E-enabled education management systems. The education management systems and E-education content has been successfully exported to the United States, Oman, Bahrain, Syria, Saudi Arabia, Algeria and Morocco.

There have been limited successes with e-Government services development. These successes could be magnified if the GoJ is able to articulate and adhere to the e-government priorities which they establish. Government E-transformation is the responsibility of all government agencies. The trend in the international arena is focusing on the whole of government, Mobile Government, E-Participation, and Open Data. It is imperative that that all government agencies approach transformation in this context.

Information Technology (IT) revenues grew from USD 60,000,000 (local and export revenues) in 2000 to a high of USD 962,435,094 in 2008. IT revenues declined from 2008, reaching USD 738,055,284 in 2011[3]. The greatest decline between 2008 and 2011 was in domestic revenues. This decline in revenues indicates a delayed impact of the global economic crisis on the private sector (locally and regionally) which started in 2007 as well as lower direct government spending, and insufficient government involvement and leadership in creating economic opportunities for the sector. Exports increased slightly from USD 226,863,277 in 2008 to USD 230,528,961 in 2011[4] indicating increased sector effort on developing export markets and also possibly due to the introduction of Information Technology Enabled Services (ITES) such as call centers and Business Process Outsourcing (BPO) as a new subsector.

IT Growth (2000 – 2011) Summary 2000 – 2005[5]

2000		2001	2002	2003	2004	2005
IT Export Revenue (JD)	**8,496,000**	**28,320,000**	**28,346,904**	**49,367,424**	**56,222,806**	115,134,619
Growth %	NA	233.33%	0.10%	74.16%	13.89%	105%
% of Total Revenues	20.00%	23.53%	17.52%	24%	18%	28%
IT Domestic Revenue (JD)	**33,984,000**	**92,040,000**	**133,421,184**	**160,137,564**	**255,661,565**	**296,123,921**
Growth %	NA	170.83%	44.96%	20.02%	59.65%	15.80%
% of Total Revenues	80.00%	76.47%	82.48%	76%	82%	72%
IT Total Revenue (JD)	**42,480,000**	**120,360,000**	**161,768,088**	**209,504,988**	**311,884,371**	**411,258,539**
Growth %	**NA**	**183.33%**	**34.40%**	**29.51%**	**48.87%**	**31.86%**
IT Foreign Direct Invest. (FDI) Yearly (JD)	**NA**	**NA**	**5,667,894**	**8,208,906**	**2,053,200**	**7,451,531**
IT FDI Cumuli. (JD)	**NA**	**NA**	**5,667,894**	**13,876,800**	**15,930,000**	**23,381,531**
IT & ITES Emp.	**1,250**	**6,000**	**8,000**	**8,117**	**8,523**	**10,032**

IT Growth (2000 – 2011) Summary 2006 – 2011[6]

2006		2007	2008	2009	2010	2011
IT Export Revenue (JD)	**135,596,428**	**139,410,645**	**160,619,200**	**148,345,020**	**143,211,234**	**163,214,504**
Growth %	17.80%	2.81%	15.21%	-7.64%	-3.46%	13.97%
% of Total Revenues	25.00%	22.30%	23.57%	23.41%	27.64%	31.23%
IT Domestic Revenue (JD)	**409,616,382**	**485,732,649**	**520,784,846**	**485,306,658**	**374,936,648**	**359,328,636**
Growth %	38.33%	18.58%	7.22%	-6.81%	-22.74%	-4.16%

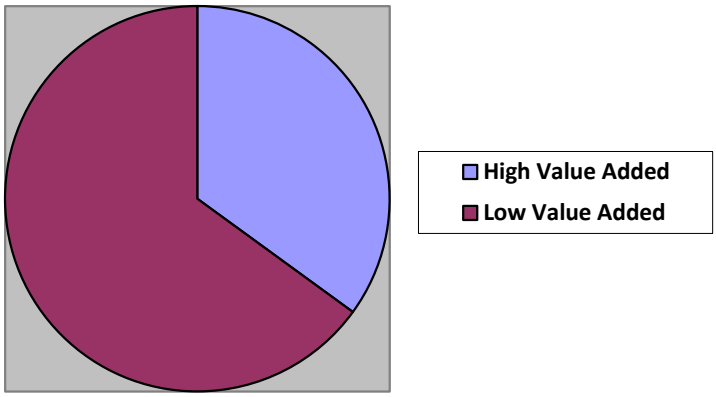
[3] ICT & ITES Industry Statistics & Yearbook 2011 (INT@J, Ministry of ICT), page 13, 14.
[4] Ibid
[5] Ibid
[6] Ibid

% of Total Revenues	75.00%	77.70%	76.43%	76.59%	72.36%	68.77%
IT Total Revenue (JD)	**545,212,810**	**625,143,294**	**681,404,047**	**633,651,678**	**518,147,882**	**522,543,140**
Growth %	32.57%	14.66%	9.00%	-7.01%	-18.23%	0.85%
IT Foreign Direct Invest. (FDI) Yearly (JD)	**9,607,316**	**2,174,120**	**1,196,620**	**11,491,779**	**10,580,500**	**980,000**
IT FDI Cumuli. (JD)	**32,988,847**	**35,162,967**	**36,359,587**	**47,851,366**	**58,431,866**	**59,411,866**
IT & ITES Emp.	**10,712**	**11,034**	**10,294**	**11,334**	**9,858**	**11,235**

If one analyzes the split between domestic and export revenues, one will realize that Jordan's competitiveness as indicated by the high level of added value is the primary determinant in its ability to export, whereas declining domestic revenues indicate that the local economy is either unable to absorb or pay for new knowledge integration and/or innovation by ICT companies into their products and services. The addition of new knowledge and/or innovation assists in improving the efficiencies of company/corporate processes (manufacturing, marketing, etc.) or developing new products and services to meet unmet needs or adding additional features to existing products. Adding value to existing products and services and/or creating new products and services based on new knowledge enables higher prices to be charged (improved profitability) or helps in displacing competing products or services from the market (local and export).

The inability of the local economy to absorb high value added products and services are related to Jordanian corporate organizational capacity. Over 99.6% of registered companies are considered micro small or medium sized enterprises[7]. The small size of most Jordanian companies hinders the purchase of IT solutions. A recent EU study[8] has indicated that a nation's organizational capability, as indicated by the existence of mature corporate policies and procedures within companies, affects a company's/nation's ability to absorb ICT effectively.

Jordanian Domestic IT Revenue (High Value Added = 35%)[9]

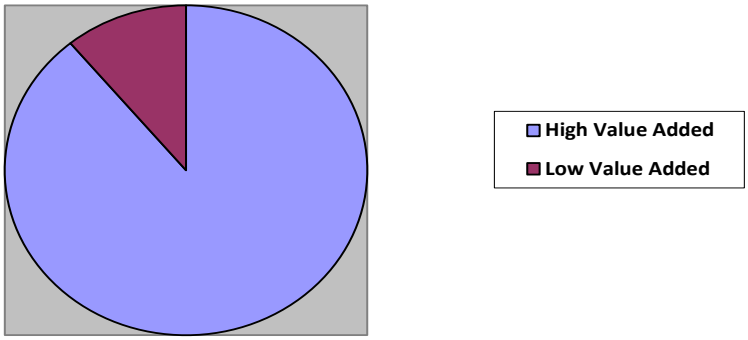


[7] http://planipolis.iiep.unesco.org/upload/Jordan/Jordan_NHDR_2011.pdf

[8] http://ec.europa.eu/information_society/eeurope/i2010/docs/eda/econ_impact_of_ict.pdf

[9] ICT & ITES Industry Statistics & Yearbook 2011 (INT@J, Ministry of ICT), Page 24

Jordanian Export IT Revenue (High Value Added = 89%)[10]



ICT sector growth over this period has taken place in new verticals that is more consumer based than corporate based. This has been due to the large growth of both internet but more importantly mobile penetration in Jordanian society. The increase of IT consumption by regular mobile and internet users has fuelled non-traditional (technical programming) growth. This is an indication of the impact of consumerization of ICT products and service development[11]. Moreover, the growth of ITES such as call centers and outsourcing has also created new untapped areas for sector growth particularly in exports.

ITES services (call Centers and Business Process Outsourcing)[12]			
Year	Domestic Revenues (JD)	Export Revenues (JD)	Total Revenues (JD)
2011	375,311	4,556,999	4,932,310
2010	491,021	1,497,102	1,988,123
2009	435,000	1,881,608	2,316,608

The growth of ITES in Jordan indicates the ability to leverage existing HR skills and provide value added services to domestic and export markets. Because Jordan has limited human resources in terms of numbers, Jordan's demonstrated success has been based on going up the value chain where greater and more sophisticated services can be delivered. This developmental direction in ITES will allow Jordan to extract larger revenues from proper use of its university educated population.

[10] ICT & ITES Industry Statistics & Yearbook 2011 (INT@J, Ministry of ICT), page 24

[11] http://ec.europa.eu/information_society/eeurope/i2010/docs/eda/econ_impact_of_ict.pdf

[12] ICT & ITES Industry Statistics & Yearbooks for years 2011, 2010, 2009, 2008 (INT@J, Ministry of ICT) – accumulated data from ITES tables and telecommunications tables.

Telecommunications Revenues (Domestic and Export)[13]				
Year	Internet (JD)	Mobile (JD)	PSTN (JD)	Total (JD)
2011	250,000,000	697,939,916	237,162,165	1,185,102,789
2010	45,784,944	668,812,200	125,543,976	840,141,120
2009	36,305,532	660,547,716	129,813,924	826,667,172
2008	No clear segmentations between Internet, Mobile & PSTN			920,341,232

There has been steady revenue growth in both internet usage and mobile usage. PSTN revenues have also grown between 2001 and 2010 albeit at a slower rate than mobile. The growth in these subsectors of communications indicates increased usage of ICT particularly through the intersection/integration between internet and mobile telephony and particularly among regular citizens/consumers. There may be increased PSTN based commercial service delivery opportunities for non-traditional services as traditional telephony migrates to mobile networks. It is also likely that additional sector growth can be developed, if Jordanian ICT companies are able to deliver meaningful services through the cloud. The growth of mobile and internet among citizens indicates the growing utility of applications for consumers (consumerism) which are launched and used on these platforms (mobile and internet) in addition to the convergence of all hardware types with the cloud.

ICT is already a common international communication delivery platform. The development of common programming languages, information technology standards (CMMI, SPOT, etc.), telecommunications standards (GSM, 3G, 4G, etc.) and the proliferation of the internet is allowing people from all around the world to create products, export and sell and communicate with each other. Moreover, with the advent of the internet and mobile telephony and mobile devices, there is now a global unified platform. Products developed on computers and mobile devices can be useful anywhere. The only limiting factor is the ability to conceptualize and develop innovative products which meet people's or institution's needs. This to a great extent is based on the creativity of the people in development and their understanding of the sectors or needs that they serve.

Since ICT has become a common international communication platform, ICT professionals have access and opportunity to international markets without the difficulties of traditional export. Thus, the main challenge to being able to exploit this opportunity is identifying what issues (challenges and opportunities) need to be addressed in industry or among regular consumers (local, regional and international) and develop innovative solutions to address these challenges using IT technologies and deploying on one or more platforms.

In Jordan opportunities exist among a number of high values added industries such as pharmaceuticals, clean technology, agriculture, architecture and engineering, medical/healthcare services, tourism and content among others. The ICT sector needs to identify specific opportunities in these sectors. This can be done by working closely with the management of these knowledge sectors or with the consulting sector that are familiar with these sectors. An EU

[13] Ibid

study[14] has stated that educated knowledge based sectors will be more able to exploit ICT in their businesses than non-knowledge based sectors making ICT diffusion easier. This is to a great extent due to the fact that knowledge based sectors are more likely to have developed institutional/organizational capital in the form of developed and well-articulated policies and procedures which are the basis for successful ICT diffusion into the sector. It is these policies and procedures which form the foundation for improved efficiencies in organizational management.

ICT opportunities also exist in digital content creation for consumers. Jordan has witnessed a jump in growth in this highly creative field because it is easily delivered by mobile devices and the internet, it is easily understood and appreciated and because it integrates a variety of value adding components (sound, narration, film/video, music, graphics, animation, interaction design, acting, script writing, etc.). Digital content has application on mobile devices as well as the internet and has the potential for easy regional and international export as well.

Jordanian companies which demonstrate innovative competency in application development, resulting from the intersection/diffusion between ICT and the specific industry vertical or digital content development will be able to successfully develop and sustain exports. Opportunities also exist in the outsourcing sector, where educated and/or certified Jordanian workers can provide value adding services to local and regional companies from call centers at the bottom of the value chain to knowledge process outsourcing which leverages Jordan's national investment in education.

[14] http://ec.europa.eu/information_society/eeurope/i2010/docs/eda/econ_impact_of_ict.pdf

Alignment with the Government of Jordan's (GoJ's) ICT Policy and Initiatives

The Statement of Government Policy 2012 on Communications, Information and Postal Sectors focuses on the establishment and execution of policies to leverage ICT as a means for social and economic development. As such, the intent of this national ICT strategy document is to use ICT as a tool to improve economic activity and job creation. GoJ policy can be an effective tool to direct national efforts towards local ICT use (diffusion), increased ICT exports and increased job creation in ICT and ICT affected or improved sectors. Moreover, effective economic development can only come about if an effective and cooperative public and private partnership is developed and maintained.

The GoJ embarked on several E-Initiatives (Education, Government Services and Health). The E-Education initiative resulted in several local companies developing internationally competitive products and services. A local content management system and Education management system was developed in and has been exported to the United States, Bahrain, Oman, Saudi Arabia and Syria. Another local company has developed Arabic Language based E-curriculum for science and mathematics. This company has exported its E-curriculum to Algeria, Morocco, Oman and Saudi Arabia, where it now is used in the education of over one million students. This same company has also branched off into mobile educational application development. One of the most recent E-Education applications has won a World Summit Award for mobile application development. Growth in E-Education would not have occurred without Government leadership.

The E-Government initiative has resulted in less dramatic results over the past several years. The E-Government initiative needs to be aggressively reexamined. The Ministry of Public Sector Development (MoPSD) in collaboration with MoICT and other concerned government entities shall set priorities with regard to developing the public sector E-services and utilizing ICT infrastructure. MoICT needs to identify/study new modalities with which to attract private sector investment in developing and managing E-Government services. MoICT also needs to identify appropriate revenue sharing models to attract private sector (local and international) involvement in developing E-Government services. Successful development and launching of E-Government services will lead to the development of new ICT based products and service management competencies which are likely to have export potential.

To enable the many important GoJ supported E-Initiatives, the GoJ initiated establishment of a national broadband network (NBN) as a private governmental network in 2003 as a means to make computers and networks more widely available to the public and to launch and enable (E-Education, E-Health and E-Government). Due to fiscal constraints, the GoJ is facing difficulties in completing the NBN project. In addition, much of the NBN investment has remained unexploited by both the government and the private sector. To achieve the GoJ policy goal of making ICT services more widely available to the public, GoJ will have to harness the financial and business capability of the private sector (local and/or international) to complete the NBN and to make effective use of this infrastructure. As such, GoJ needs to identify priorities to be implemented, identify/study cooperative modalities with the private sector and develop and continuously communicate attractive revenue sharing schemes to increase private sector interest in completing the NBN as well as exploiting its capacity for GoJ and private sector use.

The GoJ passed the National Information Assurance and Cyber Security Strategy (NIACSS) in September 2012. The main objective of NIACSS is to give structure and involve and empower all concerned entities to more effectively secure computer networks they own, operate, control or interact with. This will strengthen Jordan's information and Communication infrastructure for both the public and private sectors. This was done based on the knowledge that the national ICT infrastructure needs to be robust, secure and trusted to have the desired positive impact on national economic and ICT sector growth.

The Strategy[15]

ICT provides Jordan with a unique opportunity to develop a competitive and sustainable export oriented industry. Jordan's strategic challenge is to focus national effort and resources (private and public sector) to extract the greatest opportunity for the country to create jobs and export driven economic growth. The national ICT strategy should focus on leveraging identified national strengths. Currently general national strengths are university educated labor, high levels of literacy, and relatively good ICT infrastructure. To maintain competitiveness in this sector, it is imperative that the public and private sector work to ensure that education and ICT infrastructure remain internationally competitive and improve.

Strategically, Jordan should focus on areas of established competitiveness and sectors where value creation is possible through the facilitation of economic clustering and integration. This means identifying those economic sectors where Jordan has demonstrated ability over time to consistently provide internationally and regionally competitive services or products. Additionally, Jordan should focus on integrating and serving regional value chains as well to improve overall regional competitiveness. This can include sectors such as the oil and gas industry, water desalination and management as well as banking and finance. These are areas where Jordan does not necessarily have established competency, but can develop a capability to serve these regional market needs through such ICT services as localized content and BPO development.

Over the past several decades Jordan has distinguished itself across several sectors. These sectors are:

a) Pharmaceuticals
b) Healthcare/medical tourism
c) Architecture and Engineering
d) Tourism
e) Information and Communication Technology (ICT)
f) Logistics
g) Banking and Finance
h) Education

The majority of these sectors are represented in the Jordanian National Competitiveness and Innovation Council, a public private partnership, hosted at the competitiveness department at the Ministry of Planning and International Cooperation (MoPIC). Additionally, Jordan must develop technical competence in clean technology as well as design intensive manufacturing. Both these sectors address pressing strategic national needs in terms of energy dependence and water security (clean technology) as well as job creation and export opportunities (design intensive manufacturing). These sectors provide the ICT sector with a unique opportunity to develop products and services based on their intersections. Development of industry specific products and services will help in national ICT diffusion.

[15] Annexes 1,2, and 3 discuss in details the current "Limitations", how to "Turn Challenges into Opportunities", and "Where to Focus and Why".

Integrating Knowledge:
Incorporation of knowledge into a product or service design is where value and competitiveness is created. Thus facilitating intersections between ICT and other sectors is important. Moreover, increasing cooperation between ICT companies and universities and research centers can help integrate new knowledge in the form of R&D to develop new products and services. This will require that ICT companies and/or potential users of ICT properly define their R&D requirements (desired outputs/outcomes) before engaging universities and research institutions.

The ICT industry, in cooperation with management consultants and process experts will be able to identify opportunities and provide technical insight in any of the non-ICT sectors to develop products and services which will meet a pressing, identified sector need. Having a deep understanding of sector challenges and dynamics is essential to developing a high value added, competitive product and assists ICT to become a sector enabler. Once ICT solutions are developed ICT can more easily diffuse into the sector and improve sector efficiencies and competitiveness.

Well-conceived and executed ICT products which address specific sector needs will improve the international competitiveness of the ICT sector because individual companies within the ICT sector will be focused on specific industries/sectors and will incorporate deep vertical knowledge of the sector which they serve. This is particularly true for products and solutions which serve highly specialized and small markets where scale economies are difficult to achieve. It is in these markets that that Jordanian ICT companies can successfully compete. Large international companies avoid these markets because they are either small or the price for their product or service will be uncompetitive and comparatively high.

Training and Education:
To maintain its international competitiveness, Jordan must address those factors which created its current sector competitiveness. Specifically, Jordan must develop ways to continually fuel sector growth with talented, trained and certified labor. The creation of a national ICT bridging program is being pursued through two separate initiatives. The MoICT in cooperation with the Royal Scientific Society (RSS) has launched a bridging program. INT@J and the private sector (with IFC support in developing a business plan) are also working to provide agile professional development, training and certification for ICT graduates and professionals. It is envisaged that both initiatives will eventually merge or combine at a later stage.

It has also been suggested by the private sector that Jordanian universities and private sector ICT companies collaborate to identify model “CVs” for the different ICT roles needed in the market/economy. This can be supported by the ICT specific Qualification Framework intended to be developed as part of IFC support to INT@J. The purpose of a qualification framework is to provide higher education institutes, employers, present and future employees, training institutions, and other stakeholders with a guide as to what skills and competencies are needed in the labor market. Based on identification of the required skills and competencies (model CVs), the private sector would then collaborate with university faculty/ accreditation council in selecting the courses and topics required to develop the required skills and knowledge. The

private sector might be required to participate in the education by providing training and guidance. Career counselors working at high schools can take advantage of these model CVs to help students identify the most suitable career for their individual strengths and predispositions.

Infrastructure:
Jordan needs to maintain the competitiveness of its ICT infrastructure (national communication infrastructure and private sector IT infrastructure). There are numerous regional and international opportunities which can be exploited by Jordanian ICT companies if they maintain familiarity with new ICT infrastructure technology. Training, certification and access to modern infrastructure are required if Jordan's ICT sector is to remain able to meet local ICT development needs/opportunities as well as remain a trusted, regional ICT talent base. It is the role of the government to create new market entry possibilities and maintain an environment that is inductive to needed and new ICT infrastructure investment opportunities for the private sector which will help facilitate growth in the economy.

New economic opportunities can be created and exploited when existing infrastructure is fully accessed and utilized, particularly when the local copper is unbundled. Existing copper wire infrastructure integrated with new technologies can reduce the cost of internet penetration as well as facilitate new ICT opportunities. Moreover, it is necessary for the GoJ to adjust regulation and legislation, such as passing the E-transaction, E-Commerce, Privacy and Data Protection related laws/regulations/instructions to facilitate increased ICT enabled economic activity (E-commerce, E-logistics, E-banking, etc.). New economic opportunities can be more aggressively pursued when the Universal Service Policy is revised and the Universal Service Fund is established.

The GoJ invested in establishing a national broadband network (NBN) as a private network for the government. The intent of this GoJ initiative was to bridge the digital divide between all citizens and to enable the provision of ICT services (E-Government, E-Health, E-Education, etc.) to all segments of society. NBN was also to act as a tool to enhance the development and competitiveness of local ICT companies in areas such as e-education. NBN's required investment has proved too large for the GoJ to financially complete and exploit. To benefit from the sunk costs of the GoJ investment, the existing NBN must be completed and activated through creating bold opportunities for the private sector to develop and deliver services to consumers (E-Education and E-Health, cable television, etc.) or by creating national large scale demand/usage for E-services (E-Commerce and E-Government). Successful exploitation of NBN will require identifying national E-Government, E-Service priorities by the government (in cooperation with the Ministry of Public Sector Reform), passing the PPP law (or at least agreeing on or adopting acceptable partnership models), arriving at acceptable revenue sharing models and passing the E-transaction, E-Commerce, Privacy and Data Protection related laws/regulations/instructions.

The NBN or operational usage of the NBN can be transferred to the private sector (local and/or international) for exploitation. Partial or complete handover to the private sector will greatly reduce or eliminate GoJ operational costs to run the NBN. This will free up public sector funds which can be re-directed towards developing new needed national infrastructure. National demand for NBN services and applications can be enhanced through GoJ funding (partial or through PPPs) for the construction of open access fiber optic networks.

Considerable part of the funding needed for the upgrade of existing communication networks may be generated through the organization of a 4G frequency auction among interested providers to obtain for example a 15 years license. Resources generated through the auction can be allocated to MoICT for upgrading the communications infrastructure. This is common practice in various EU countries (Germany, Sweden and the UK). The United States and Singapore have also reinvested the results of spectrum auctions. Generally, these countries reinvested the financial proceeds of the auctions in Science and Technology Development (including ICT), but often governments provide the results of the auction to the national Treasury. As such, proceeds from any sale of a public good may be earmarked for infrastructure development (possibly take on debt to upgrade national infrastructure and then allocate proceeds to cover the debt).

Export Development:
Export development is essential to developing sustainable economic growth and job creation. The Jordanian economy is too small and poor at present to fuel substantial economic growth. Exports to larger and/or wealthier countries are required to develop and sustain job creation, as well as sustainably improve company revenues and profitability. Jordanian ICT companies will only be able to export successfully if they are able to develop competitive products and services which have high utility for their intended target markets. High utility (added value) will allow Jordanian companies to charge higher prices with higher profit margins. It is for this reason that ICT companies are recommended to develop working relationships with Jordan's most competitive knowledge sectors such that they can identify specific needs which can be addressed through ICT product/service development and incorporate the knowledge and experience of the targeted sector. Moreover, the ICT sector can also focus efforts on the development of Arabic language based digital content targeting regional export markets.

Stimulating Investment:
The Telecommunications sector in Jordan has grown to a great extent because of foreign direct investment (FDI). FDI has been important not only for the investment which it brings but also for the operational expertise which accompanies the investment. If the telecommunications sector is to continue to grow and expand, the GoJ has to develop attractive investment opportunities (partially based on private sector input and initiative) which will continue to attract foreign operators and investors as well as facilitate local domestic investment. Attractive investment opportunities are based not only on the provision and management/operation of new technological infrastructure but also on the development and launching of value adding services.

Investment in domestic IT companies should also be promoted. This can be done in cooperation with the JIB and INT@J, when a clear and competitive value proposition can be defined. A value proposition will be easier to define, defend and promote for investment when clear specialized utility can be demonstrated. This will be easier to do after successful intersections with other competitive economic sectors yield useful products and services.

Business and Investment Environment:
Attracting investment is not only an issue of identifying and promoting lucrative business opportunities but is also intimately related to providing and maintaining a competitive business

environment. Jordan needs to develop its business environment to be competitive on an international scale. Laws must be internationally competitive and equally applied across all businesses. Not doing so will facilitate greater migration of Jordanian companies, management and capital to more attractive environments. This will further increase unemployment and reduce exports, putting Jordan in an increasingly precarious economic and social position.

Also taxation (direct and indirect), licensing and fee regimes need to be unambiguous, consistent and transparent. GoJ needs to publish how taxation, licensing and fee regimes are applied. This will prevent inconsistent interpretation by companies as well as government employees and provide a standard which the private sector (local and foreign) can depend upon. Moreover, publication will provide the GoJ and the private sector a reference to review and evaluate the Jordanian investment environment to maintain its regional and international competitiveness. This is extremely important for the sector, JIB and various business associations who will be responsible for promoting local and foreign investment to develop the sector. Of particular importance will be ICT and BPO investment.

Once a stable and attractive investment environment secured, a strategic ICT sector investment plan should be developed between INT@J, JIB and the Chambers of Trade and Commerce which will highlight opportunities for local and foreign investors. The plan should identify target markets and potential partners for investment.

Strategic intent:
ICT is a platform which will enable export led economic growth in ICT and other high value added sectors, through high value added product and service development, which leverages the energy and creativity of youth and Jordan's educated population. ICT will enable greater competitiveness in specialized economic sectors which will develop sustainable high value added job growth as well as reduce the digital divide between Jordan and more developed countries with regards to ICT development and use.

Vision Statement:
A collaborative Jordanian public and private ICT sector that develops and maintains a fair competitive environment that attracts and encourages further investment in the sector which translates into the development of innovative, competitive (exportable) and affordable products and services which satisfy customer needs enabling Jordan to be viewed as a regional ICT hub for the development and delivery of competitive ICT products and services.

Mission Statement:
ICT is Jordan's engine of economic growth and job creation through harnessing the energy, creativity and talents of its educated youth to extend establish and maintain export markets by:

- enabling local high value added (non-ICT) sectors to improve their competitiveness,
- Exploiting and developing national infrastructure,
- Developing international technical and business linkages and
- Serving regional and international technology and operational needs.

Strategic Objectives:

This strategy defines six major strategic objectives and a number of strategic catalysts that expedite the achievement of these objectives.

1. Improve Business & Investment Environment by:
    - Enhancing the legislative and regulatory framework to increase competition, reduce barriers to market entry, and to facilitate E-commerce.
    - Managing Radio Spectrum Effectively to enable the creation on new market possibilities.

2. Increase foreign direct investment and bolster domestic investment by:
    - Identifying and marketing investment opportunities in targeted ICT verticals
    - Creating Techno-poles.
    - Promoting intellectual Property Development and Registration.
    - Supporting ICT Innovation Centers

3. Boost exports of IT and ICT enabled national products, services and capabilities by:
    - Facilitating intersections between ICT and other high value added sectors
    - Matching local products, services and capabilities with ICT export markets' needs.
    - Developing a National Export House.

4. Maintain and develop a competitive telecommunication infrastructure to support continuous IT sector innovation and to serve local and regional ICT markets by:
    - Updating local ICT infrastructure.
    - Encouraging Infrastructure and facilities sharing.
    - Facilitating private sector exploitation of NBN.

5. Develop agile national professional training and certification capabilities to meet local and regional ICT sectors' needs by:
    - Maintaining knowledge of what the ICT sector (locally, regionally, and globally) requires in terms of skills.
    - Providing agile, sector responsive technical and managerial training to address the needs of the ICT industry.

6. Stimulate the creation and development of suitable Arabic language and relevant digital content that is accessible online throughout the Arabic speaking region by:
    - Accelerating convergence between ICT and innovative audio visual services
    - Increasing awareness among potential developers and users.

National Targets:

The National ICT strategy has identified the following measurable targets as an outcome of achieving the strategic objectives defined below.

Target	2011 Baseline	2017 Target
Investment[16] (ICT)	205 M $	450 M $
Internet Penetration	(63% penetration – Q3 2012)	85%
Revenues[17]	2.Billions $	3.15 Billion $
Employment (direct)	15,835	20,000

[16] This includes local and foreign direct investment in Telecom and IT.

[17] This includes domestic and export revenues of Telecom and IT companies.

Governance Structure

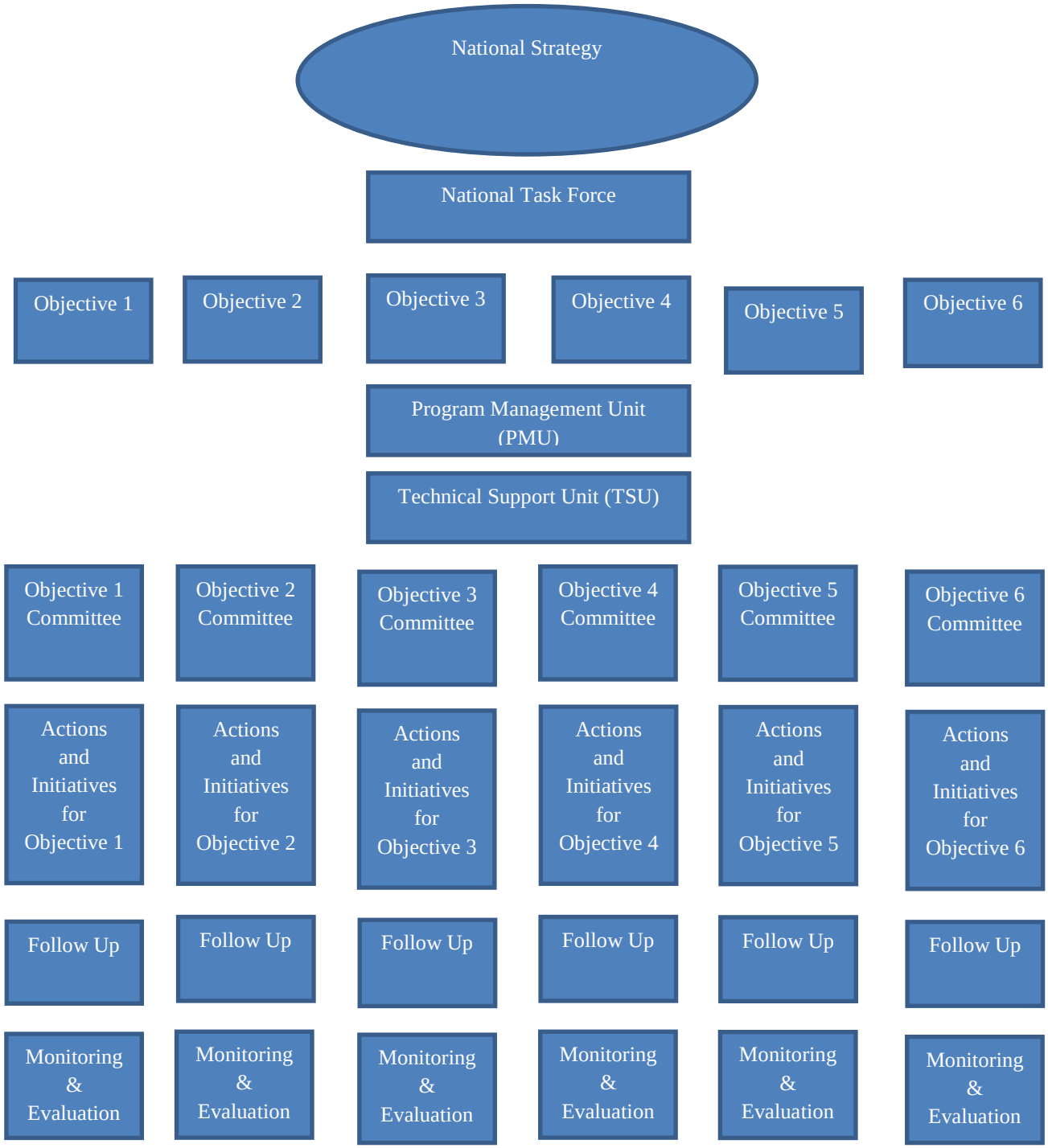
Executing the proposed National ICT Strategy 2013 – 2017 will require integration and coordination among all relevant stakeholders to implement the recommendations and initiatives articulated in the Strategy. All of the initiatives and actions identified to implement the strategy require the cooperation of often different stakeholders. As such, it is important to subdivide the responsibility of follow up on implementing specific objectives to the participating stakeholders responsible for specific objectives as well as the defined actions.

Executing the National ICT Strategy is a complex undertaking. It is important that a National Task Force, a Program Management Unit (PMU) and a Technical Support Unit (TSU) be created to be responsible for identifying, managing and overseeing the execution of highly specific tasks and activities to achieve the strategy's defined objectives. The TSU will be responsible for developing and preparing documents and studies which identify specific tasks and actions required to develop the telecommunications sector for the purpose of facilitating economic private sector and IT sector development. Moreover, the TSU will work on prioritizing its recommendations to direct the PMU to provide rational and studied guidance to the implementing committees. The PMU would report to the National Task Force which would be comprised of stakeholders from the public, private and NGO sectors. The National Task Force would derive its authority from the cooperating stakeholders. The private sector and public sector are jointly responsible for determining and securing the annual funding requirements for the PMU and TSU and to jointly contribute to the funding of both units. The national task force is expected to be a voluntary task force made up of relevant stakeholders who fund the PMU and TSU.

It is also the joint responsibility of MoICT and the ICT private sector to seek support to secure funding for the execution of the defined activities needed to achieve the stipulated objectives. GoJ support includes communicating ICT Strategic Plan objectives and activities as a national priority when seeking international donor funding and technical assistance. MoICT, MoPIC, relevant GoJ entities and the private sector are likely to have to revisit the prioritization of the defined activities and strategic objectives depending on availability of funding and define where donor technical assistance can fill needs defined by the activities and objectives. As funding is expected to remain a challenge, it is likely to consider private sector commercial investments, whenever feasible, to achieve many of the stated objectives. Execution of activities and achievement of objectives is directly related to obtaining funding allocated for specific activities and/or recruiting international technical assistance for the same purpose.

Individual committees should be formed from the responsible stakeholders identified for each strategic objective to oversee and execute highly specific tasks required for each strategic objective. Each committee would be responsible for delivering/achieving the required KPI's and would report to the Program Management Unit. Committees should meet periodically (as determined as necessary by the individual committees) to execute the specific actions at timings that are agreed upon by the individual committees. The committees would report to the Program Management Unit regarding the progress being made in implementing the specific task as well as identifying any potential obstacles that might be faced. The Program Management Unit will monitor, evaluate and report the progress and or obstacles to implementing the National ICT Strategy to the National Task Force. The National Task Force would be chaired by

the Minister of ICT and Co-Chaired by INT@J Chairman. The Program Management Unit will elect its directors based on the participating stakeholders.



Action Plan

The Action plan should be reviewed and updated frequently (at least bi-annually) in response to international developments by competing economies and competing ICT sectors and in response to identified and articulated ICT sector needs. Execution of activities and thus achievement of objectives is directly related to obtaining funding allocated for specific activities and/or recruiting international technical assistance for the same purpose. **Annex 5** provides guidance to readers of the annual financial requirements to execute all initiatives and actions defined in the National ICT Strategy. Financial requirements identified in this strategy are estimates. Actual requirements are to be defined by responsible stakeholders prior to implementation.

All the activities described in the National ICT Strategy are activities of national importance. While the majority of actions require financial resources, the most substantial are related to telecommunication infrastructure investments. With Jordan's open telecommunication sector, such investment opportunities can only be identified as an opportunity not imposed on operators or investors. Therefore, whether such investments are actually made depends on whether investors/operators perceive the benefit of the investment. Since the GoJ is no longer active in or financially capable of making infrastructure investments, the ability of both the telecommunications and IT sector to benefit from new telecommunication investments depends on the how investors/operators view the commercial viability of the investment. For this reason, it is the government responsibility to provide and maintain a business environment which is conducive to repeated private sector investment and which enables the ICT sector to grow and be competitive by considering proactively all legal and regulatory implications.

Although the responsibility of most investments falls on the private sector, particularly those related to infrastructure, education and product and service development, it is the joint responsibility of MoICT and the ICT private sector to seek support to secure funding for the execution of the defined activities needed to achieve the stipulated objectives. Activities are to be re-prioritized based on the availability of funding as funding is expected to remain a challenge which may hinder the achievement of the strategic objectives and defined targets.

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
1. Improve Business & Investment Environment.	1.1 Legislative and Regulatory Framework Enhancement[18]	**1.1.1** Revision of the telecommunications law.	MoICT, TRC, Council of Ministers, Parliament	Already started, to be completed by end of 2013	None	• Passing of proposed Amendments.
		1.1.2 Revision of and passing the proposed amendments to the E-Transactions law and related regulations.	MoICT, TRC, Central Bank of Jordan, Council of Ministers, Parliament,	April 2013, duration six months	None	• Passing of proposed Amendments.
		1.1.3 Drafting and passing new E-Payment regulations based on the approved amendments of the e-transaction law.	Central Bank of Jordan, Council of Ministers,	July 2013, duration six months[19]	None	• Passing of proposed Amendments.
		1.1.4 Introducing a new Privacy Act.	MoICT, TRC, Ministry of Interiors Council of Ministers, Parliament	July 2013, duration six months	None	• Passing of a new act.
		1.1.5 Passing of the PPP law (or officially recognizing partnership modalities which are attractive to the private sector) to facilitate private sector involvement in national ICT infrastructure investment.	Council of Ministers, Parliament	July 2013, duration six months	None	• Passing of PPP law or official recognition of specific partnership modalities. •
		1.1.6 Propose and draft a Venture Capital Legislation	MoIT, JIB, INT@J, MoP, Private	July 2013, duration 15	150 K JD	• A VC Legislation Draft & Issuance

[18] Suggested timeframes includes submitting suggested legislative amendments to Council and Ministers which forwards it to Opinion and Legislation bureau for revision and finalization before submitting to Parliament. It does not include the revision and approval phase at Parliament.

[19] Active new e-payment regulations will be subject to the approval/passing of the e-transaction law amendments.

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
			Sector Investors.	months		
		1.1.7 Enabling the TRC to have the necessary technical and business expertise and capacity and to maintain a highly skilled team of sufficient size to fulfill its responsibilities in terms of creating a suitable regulatory environment and be able to effectively implement and enforce its decisions in a timely manner	TRC, Council of Ministers	April 2013, on-going	None	• Number of TRC resources getting specialized technical and business/economics related training. • Number of new TRC hired with specialized technical and business/economics related skills.
	1.2 Reviews of relevant telecommunications markets and sub-markets	1.2.1 Conduct reviews of relevant telecommunications markets and sub-markets that reflect recent data and market conditions in order to ensure having an effective regulatory framework that mitigates the effects of dominance and protects competition and consumers	TRC, Telecom Operators and Service Providers	January 2015 Duration nine months	500 K JD	• Publishing Market Review results.
		1.2.2 Adjust regulations to facilitate competition among communication providers through value added services. Such regulations would prevent incumbent operators from leveraging their existing infrastructure (copper, towers, ducts, etc.) to prevent the entry of new operators and would ensure access to and use of such infrastructure is available to others on a non-discriminatory basis and on reasonable terms and conditions	TRC, Operators and/or service providers	October 2013, duration six months Regulations revised after conducting market reviews, October 2015, duration six months	None	• Number of operators using existing incumbent/existing infrastructure and providing new services. • Increase in services provided by operators.
	1.3 Universal Service Policy Revision	1.3.1 Revise the Universal Service Policy, to ensure the correct balance between the freedom of operators to offer the	MoICT, TRC, Telecom Operators and	December 2014, Duration	250 K JD	• Updated Universal Service Policy

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
		competing services of their choice and the need to ensure the affordability and availability of telecommunications services throughout the Kingdom.	service providers	nine months		
		1.3.2 Implement the outcomes/requirements stipulated in the revised universal policy (Example developing the required regulatory framework, activating a USO fund,…etc.)	MoICT, TRC, Telecom Operators and Service providers	October 2015, Duration ten months.	(Dependent on outcomes/requirements resulting from the universal service policy revision)	• (Dependent on outcomes/requirements resulting from the universal service policy revision)
	1.4 Implement innovative spectrum management to exploit the largest economic and societal benefit from this limited public resource.	1.4.1 TRC to investigate and adopt, if possible, advanced spectrum management principles including but not limited to a technology and service neutral approach to spectrum, spectrum reuse and spectrum sharing, and the potential for secondary spectrum markets to facilitate more intensive use of existing licensed spectrum to provide value added services	Existing Operators, TRC	Starts July 2014, continuous	None	• Adoption of advanced spectrum management principles by TRC (through revised regulation) • Number of new technologies/ services offered on existing spectrum allocation. • Improved capacity utilization of existing spectrum allocation.
		1.4.2 Identify the revenue generation possibilities (with existing operators and/or international operators) derived from releasing additional spectrum to the market. Prioritize these opportunities for development.	Existing Operators and/or International Operators, TRC	April 2014, duration six month	None	• List of opportunities which can be developed with additional spectrum. • Prioritization of this list.
		1.4.3 Identify what additional spectrum can be freed up by switching to digital transmission. What is the size of the "digital dividend"?	TRC	January 2015, duration six month.	None	• List describing how much spectrum can be freed up by going to digital transmission.

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
		1.4.4 Identify when and how much extra spectrum could be freed up (after implementing what series of opportunities).	TRC	April 2015, six month.	None	• List of opportunities which can be implemented with existing commercially sanctioned and underutilized spectrum. • List of opportunities which can be implemented after switching to digital transmission.
	.	1.4.5 Free up unused spectrum and place under the preview of the TRC for targeted exploitation of specific opportunities.	TRC, MoICT, the Military	October 2015, One year.	None	• Official decision to free up available unused spectrum to TRC. • Amount of freed up available unused spectrum to be used for commercial purposes
		1.4.6 Come to an agreement with the military on how to make use of freed spectrum in specific defined cases.	TRC, the Military	October 2016, duration three months.	None	• Written agreement defining the circumstances and duration of when spectrum can be recovered by the military.
	1.5 Revision of Tax Burdens	1.5.1 Explore the use of tax relief and other incentives in order to encourage increased penetration of PCs and other Internet-capable devices	MoICT, MoF	Jan 2014 Duration of 6 months	None	• Increase in PC Penetration. • Increase in other internet-capable devices penetration
		1.5.2 Revise and amend, if possible, the rules for offering online services' in the Jordanian market and elsewhere, with the aim of providing the most favorable possible tax treatment to e-commerce and e-businesses providers.	MoICT, MoF	Jan 2014 Duration of 6 months	None	• Increase in e-commerce activities

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
		1.5.3 Regularly review and, if necessary, adjust the tax burdens imposed on the IT sector and IT-enabled services. Such review should not only take into account the Government's short-term revenue needs but also the important role of the IT sector, both domestically and internationally, in the development and growth of the Jordanian economy and the potentially adverse impact of taxes imposed upon this sector. In addition, the Government will examine tax burdens so that, to the extent possible, similar services and products are taxed at identical levels.	MoF, MoICT, MoIT, JIB	Starts Jan 2014 on-going	None	• Increase in IT & IT enabled services sector revenue. (foreign and domestic) • Having similar services and products taxed at identical levels.
	1.6 Adoption of ICT security standards at the national level and volunteer qualification of individual companies[20]	1.6.1 Review international ICT security standards for e-transactions. Prioritize which transactions should be covered first to develop working knowledge on how to implement ICT security standards. Prioritization can look at economic development or part of E-Government roll out, etc.	MoICT, INT@J, JCS, JCC, JCI, TRC, CBJ, Association of Jordanian Banks	July 2014, duration six months.	None	• Prioritized list of international security standards. • Matrix of security standards against transaction type and relevance importance rating.
		1.6.2 Communicate the necessity and benefits of achieving specific ICT security standards within institutions through workshops and seminars.	MoICT, INT@J, JCS, JCC, JCI, TRC, Association of Jordanian Banks	January 2015, duration six months.	50 K JD	• Number of seminars and workshops held. • Cumulative number of attendees of the workshops and seminars.
		1.6.3 Develop and advise relevant entities to start implementation of an ICT security standard plan based on the defined	MoICT, INT@J, JCS, JCC,JCI, Central Bank,	July 2015, duration six month.	None	• Plan defining which ICT standards should be implemented by what

[20] These are specific priorities of the National Information Assurance and Cyber Security Strategy (NIACSS) referred to in Article 142 of the Statement of Government Policy 2012 on the Communications, Information Technology and Postal Sectors.

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
		priorities. Identify which standards should be applied to what types of institutions at what time.	TRC, CBJ, Association of Jordanian Banks			type of institutions at which time.
		1.6.4 Identify appropriate (ICT security related) training for individuals working in commerce, finance, government and education. Identify appropriate institutional certification for institutions working in commerce, finance, government and education Hold the training for individuals and provide security certification for institutions.	MoICT, INT@J, JCS, JCC, JCI, MoIT, Association of Jordanian Banks,	January 2015, on-going	Possible subsidy for training at 35K JD/year Possible subsidy for ICT security certification at 50 JD/year	• Number of training courses held. • Number of individuals attending the training courses. • Number of institutions applying for ICT security certification.
Risks	1. Proposed amendments to the E-transaction law and related regulations (Digital signature, E-transaction, E-payment, Privacy, Data Protection, etc.) are not passed. 2. PPP law and/or partnership modalities not agreed upon. 3. A VC legislation is not drafted nor agreed upon. 4. TRC not empowered or expected to facilitate increased competition through increased value added services on the existing infrastructure and new technology adoption is not pursued or facilitated. 5. Tax burdens on IT and IT- Enabled services not revised or introduced. 6. Universal Service Policy not reviewed. 7. Market studies are not conducted. 8. Lack of interest or willingness by institutions to implement ICT security standards. 9. Inability to provide technical training and/or ICT security certification 10. No clear publication of how taxation, licensing and fee regimes are applied on ICT companies, products, and services.					
Risks	**Importance**	**Action**				
1.	High	MoICT needs to communicate the importance of passing the proposed amendments to the E-Transaction Law and regulations to GoJ and Parliament. This might be done in cooperation with MoPIC for reasons of the GCR as well as MoIT.				
2.	Medium	INT@J and MoICT need to communicate the economic importance of passing the PPP law to parliament and to GoJ. This might be done in cooperation with MoPIC for reason of the GCR as well as MoIT. Alternatively, INT@J can work to identify and publish partnership modalities in cooperation with GoJ/MoICT.				
3.	Medium	INT@J needs to communicate the economic importance of passing the VC law to parliament and to GoJ. This might be done in cooperation with JIB, MoP.				
4	High	If TRC is not sufficiently empowered to facilitate increased competition, MoICT and TRC to advocate for the modification of TRC's mandate. Advocacy can be done in coordination with MoPIC and JIB. The main message should be that TRC can be an effective tool to facilitate increased innovation and sector growth.				
5	High	INT@J to share with the GoJ best practices in that regard and to advocate the economic development opportunities resulting from				

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
		the diffusion of IT and IT-enables services if tax burdens are revised and amended.				
6.	Medium	INT@J and Telecom Operators and Service Providers to advocate to MoICT the importance of ensuring the affordability and availability of telecommunications services throughout the Kingdom and to provide best practices in that regard.				
7.	High	Telecom Operators and Service Providers to advocate to TRC the need of revising telecom markets and sub-markets to have recent data on market conditions and players in order to ensure having an effective regulatory framework that mitigates the effects of dominance and protects competition and consumers. Telecom Operators and Service Providers to share best practices in that regard.				
8.	Medium	• Government, INT@J and the Chambers should develop and market the importance of an ICT security designation for local companies. • Require companies operating in the development zones, industrial estates and Free Zones to achieve specific levels of ICT security depending on the size of their business and their level of exports.				
9.	High	• Create a national program to train and certify ICT security trainers and auditors or provide subsidies for the training and certification of ICT professionals and trainers to provide training on ICT security. • Provide subsidies for ICT security certification.				
10.	High	• INT@J, to communicate economic and investment attractiveness importance & opportunities of having a clear and stable tax structure.				

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
2. Increase foreign direct investment and bolster domestic investment	2.1 Identify existing Jordanian ICT companies seeking local and foreign investment, identify investment opportunities in targeted ICT verticals such as ICT enabled BPO and content development and promote the investment opportunities locally,	2.1.1 INT@J to prepare investment summaries of companies seeking investment (including ICT enabled BPO and digital content companies)	INT@J, JCS, JCC, individual ICT companies	July 2013, duration three months (annually)	None	• Number of summaries received. • .

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
	regionally and internationally.[21]					
		2.1.2 Conduct investment assessments making sure that the companies are liquid and well managed and that there is a well-defined value proposition for interested investors.	INT@J, JCS, JCC, individual ICT companies	October 2013, duration three months (repeated annually)	50 K JD/year	• Number of opportunities assessed • Number of investment ready companies
		2.1.3 Classify and document the investment summaries according to their objective (increased market access, technology development, expansion capital, etc.) and publish on the INT@J website and the JIB website. Develop documentation of these opportunities.	MoICT, INT@J, JCS, JCC, JIB	October 2013, duration one month	None	• Publication of the investment summaries on the INT@J and JIB websites. • Number of hits on the individual websites. • Number of inquiries received.
		2.1.4 Train JIB staff on presenting the individual opportunities (on sector segments level)	INT@J, JCS, JCC, JIB and individual ICT companies	November 2013, duration one month	None	• Number of staff trained.
		2.1.5 Utilize JIB's reach and contact lists to identify individual interested investors. Communicate these investors to the individual companies. Train company staff on how to close an investment deal	INT@J, JCS, JCC, JIB and individual ICT companies	November 2013, duration on-going	50K JD per year	• Number of investors identified with the required profile. • Number of responses to the initial market contact. • Number and size of investments which occur.

[21] This initiative encompasses a strategic ICT sector investment plan that should be developed between INT@J, JIB and the Chambers of Trade and Commerce which will highlight opportunities for local and foreign investors. The plan should identify target markets and potential partners for investment.

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
						•
		2.1.6 Attend and/or hold a national ICT investment forum in which Jordanian ICT investment opportunities are highlighted and marketed.	INT@J, JCS, JCC, JIB, MoICT and individual ICT companies	January 2014, one week (repeated annually)	100 K JD/year	• Number of attendees to the conference. • Number and size of investments which occur.
	2.2 Identify and market investment opportunities for infrastructure development and or new public service provision which will improve ICT usage and convergence in Jordan. (Investment Plan I)	2.2.1 MoICT in cooperation with INT@J and existing operators should define and prioritize several infrastructure projects for marketing and promotion.	MoICT, TRC, INT@J, JCS, JCC, existing operators	January 2014, duration one month	None	• Number of investment projects defined. • Number of projects considered worthy of promotion.
		2.2.2 Classify these projects according to their objective (improved mobile services, increased internet penetration, improved opportunities for convergence, content development, etc.) and publish these opportunities on the INT@J website and the JIB website. Develop documentation of these opportunities.	MoICT, TRC, INT@J, JCS, JCC, existing operators	February 2014, duration two month	None	• Publication of the project summaries on the INT@J and JIB websites. • Number of hits on the individual websites. • Number of inquiries received.
		2.2.3 Train JIB, INT@J and MoICT staff on presenting the individual opportunities	JIB, INT@J, JCS, JCC, MoICT	April 2014, duration two months.	None	• Number of staff trained.
		2.2.4 Utilize JIB, INT@J and existing local operators reach and contact lists to identify	JIB, INT@J, JCS, JCC, TRC, local operators	July 2014, duration on-going	50K JD/Year	• Number of investors identified with the required profile.

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
		individual interested investors. Direct these investors to the TRC.				• Number of responses to the initial market contact/promotion. • Number and size of investments which occur.
	2.3 Creating Techno-poles	2.3.1 Creation of geographically specific techno-poles and technology corridors to attract private sector investment (in ICT, ICT enabled BPO, and digital contend development) in a limited geographic area.	MoICT, DFZC, MoIT, Private Sector investors, JIB	July 2013 duration of 18 months.	150K JD	• At least one techno-pole established in a geographically defined area.
	2.4 Promote Intellectual Property Development and Registration	2.4.1 Develop and deliver capacity building programs for researchers, academics and private sector on IP, the benefits of IP registration and technology commercialization.	INT@J, HCST, JCS, MoHE, International Donors, JIPA	July 2013 and on-going	50 K JD/Year	• Number of individuals completing capacity building activities. • Number of IP generated and registered. • Number of institutions applying the results of the IP.
		2.4.2 Provide support to companies and the legal community on the IP registration process (registration, legal services, etc.)	INT@J, HCST, JCS, JCC , MoHE, International Donors, JIPA	July 2013 and on-going	100K JD/Year	• Number of individuals completing capacity building activities. • Number of IP generated and registered. • Number of institutions applying the results of the IP.
		2.4.3 Facilitate collaboration through incentives that encourage universities to develop IP in partnership with	INT@J, HCST, JCS, JCC , MoHE, International Donors, JIPA	July 2013 and on-going	50 K JD/Year	• Number of research projects undertaken between research centers, universities

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
		the private sector targeting their needs (e.g. products, services, process improvement, etc.). Incentives should stimulate and facilitate collaboration rather than funding the actual R&D activities. Mechanisms for disseminating opportunities about international collaboration opportunities (such as EU and USA international collaborative research support programs) shall be developed. Research should be focused in three areas: • University-Industry collaboration, • Local-International collaboration, • Inter-sector collaboration (e.g. ICT with healthcare, logistics, tourism, etc.).				and private sector ICT companies, local and international research and inter-sector collaboration.
		2.4.4 INT@J to lead a national program to identify IP which already exists in existing Jordanian ICT products and services. These products and services need to be documented and their individual IP registered internationally.	INT@J, HCST, JCS, International Donors, JIPA	July 2013 and On-going	100K JD/Year	• Number of existing ICT companies seeking to identify latent IP in their products and services. • Number of IPs registered and published after identification.
	2.5 Support ICT Innovation Centers	2.5.1 Develop a program to support the development of	JEDCO, i-Park	July 2014 then on-going	50K JD/Year	• Number of active innovation centers.

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
		business/innovation centers or incubators as well as Technology Transfer offices to transfer knowledge and entrepreneurs from universities to real life business. Program to be led by either HCST's i-Park or JEDCO's Business Innovation Centers. Focus will be on entrepreneurs and innovations targeting the intersection between ICT and other sectors (verticals) such as healthcare, tourism, logistics, etc.				• Number of registered IPs coming out of the innovation centers as a result of intersection with competitive sectors.

Risks	
Risks	1. Few viable projects are identified with clear business objectives (marketing, technology development, institutional development, etc.). 2. Inefficient marketing by INT@J and or JIB 3. Few viable infrastructure projects are identified. 4. Poor regulation hindering the new infrastructure projects being developed and marketed as private sector investment opportunities. 5. Government hesitant to support the creation of techno-poles. 6. Little interest in capacity building for IP or commercialization. 7. Inability of industry and universities/research centers to collaborate to develop IP in partnership with the private sector. 8. No areas which can be articulated for research work. 9. Lack of Funding for research or IP registration. 10. Lack of interest in identifying and registering latent IP in existing companies. 11. Lack of funding for capacity building and training programs.

Risks	Importance	Action
1.	Medium	• Training of company leadership on what makes an interesting project for investors. • Technical assistance to help clean up project proposals (JEDCO, Institute of Management Consultants, NAFES, Business Development Center, etc.) to define clear business objectives.
2.	Medium	• Training and technical assistance for INT@J and JIB staff to improve their marketing capability. • Creation of alliances with private equity firms (local, regional and foreign).
3.	High	• Identify areas of opportunity to grow the ICT sector and or peripheral beneficiary sectors which will benefit from infrastructure development to create national interest.

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
4.	High	• Review international ICT strategies particularly with regard to sector and economic development and define common or similar objectives with Jordan. Identify the regulatory changes which were necessary to facilitate investment. • Train TRC staff and expose them to the experiences of countries that have effectively used regulation as a means to attract and develop national investment opportunities.				
5.	High	• INT@J to advocate to the government how techno-poles can be used as national technical development tools to create national ICT capacity and capability in specific sub-sectors in specified geographic areas such.				
6.	Medium	Awareness sessions need to be held to explain the importance of IP for the ICT sector.				
7.	Medium	Identify where this inability or lack of interest derives from and develop actions to address the inability or lack of interest.				
8.	High	Help companies develop and draft research requirements to address their existing challenges and problems in a manner which researchers and universities can understand and address.				
9.	High	Communicate (to raise awareness) with HCST, MoHE and JIPA on the necessity to demonstrate Jordan's innovative capacity through publishing international IP as a means to attract FDI and or product and service development outsourcing.				
10.	Medium	Awareness sessions to explain the importance of IP registration for individual companies and explain the probable benefits that will accrue to them if the companies can claim patent or copyrights on products.				
11.	High	Advocate for and seek funding from MoHE and HCST R&D Funds, seek funding from MoPIC/donor agencies for training and capacity building.				

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
3. Boost exports of IT and ICT enabled national products, services, and capabilities	3.1 Facilitate intersections between ICT and other high value added sectors	3.1.1 Hold one meeting every quarter between interested INT@J members and members of relevant associations: • Pharmaceuticals, • Manufacturing, • Clean Technology, • Architecture and Engineering, • Banking and Finance, • Medical Services • Education	INT@J, Sector Associations, JCS, MoICT	July 2013, on-going every quarter (at least)	Approx. 2500 JD/meeting Funding Sources: • Relevant Associations, • National R&D Fund, • JEDCO, • MoPIC	• Number of collaborative relationships between ICT companies and companies in key sectors. • Number of ICT products and services which are developed based on identified sector challenges and issues resulting from the intersection meetings.
		3.1.2 Identify opportunities for the public and private sectors to develop proof of concept products and services at cost or for free in which the private sector will be able to use	INT@J, Sector Associations, JCS, MoICT	July 2013, six months (annually)	50K/annually	• Number of partnership developed between the private sector and public sector. • Number of products

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
		these products to develop exports to similar institutions or use the technology.				developed because of the partnerships. • Number of products or services owned jointly by the public and private sectors. • Amount of exports resulting from these partnerships
	3.2 Identification of technical barriers hindering export of Jordanian ICT products and services.	3.2.1 Identify international and WTO export requirements which are hindering or affecting exports of Jordanian ICT products and services.	JIB, INT@J, MoIT, JCS, JCC	January 2014, duration six months	25 K JD	• List of technical barriers which hinder export of Jordanian ICT products and services.
	3.3 Export facilitation to target markets: Facilitate and target of exports by: • Understanding the needs and capabilities of local companies with respect to export, • Understanding the target markets and their needs, match local products & companies with these needs and provide them with the highest value.	3.3.1 ICT [22] Export barometer development: Export is a complex process requiring several areas of knowledge and experience. It is important to develop an exporter barometer as an assessment tool. This tool will help in measuring the export progress of companies, and help in defining appropriate export support and facilitation schemes. Uses of the export barometer: include: • ICT Industry export needs assessment, • Provide a basis for development of export support programs, • Provide a tool to measure export programs/activities performance, • Motivate companies to improve	INT@J, JCS, Jordan Chamber of Industry JCI, Jordan Chamber of Commerce JCC, MoIT, Jordan Enterprise Association JEA	October 2013 duration six months to complete the barometer.	200K JOD in year 1 then 100K JOD/year for following years	• Existence of a well-defined export barometer.

[22] To consider as well ICT-enabled BPO and digital content

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
		export performance.				
		3.3.2 Establish export technical assistance and capacity building for ICT, ICT enabled BPO, and digital content companies: Training and mentoring of local companies in export, international business development, product development, intercultural communication and negotiation skills are important areas for companies to improve their export capabilities. Training and mentoring programs shall be developed and subsidized to local companies. Training shall be developed based on export assessment studies utilizing the export barometer. Technical assistance shall help company institutional development enabling them to focus on product development and regional and international market assessment.	INT@J, JCS, JCC, MoIT, JEDCO, JEA	April 2014 - ongoing	500 K JD/Year	• Number of ICT companies receiving assistance or training on exports development. • Amount local companies are investing in such training.
		3.3.3 Develop and implement an ICT companies rating model to promote maturity of companies and enhance exports opportunities.	INT@J, MoICT	July 2014, six months development (Continuously used and maintained)	200 K JD	• Model development completion. • Number of companies rated using the model •
		3.3.4 Publishing Export Market Reports: Export market reports highlight opportunities and market trends in countries that are linked to both ICT and its intersection with verticals/other sectors. Reports shall be disseminated to the private sector to communicate opportunities and	INT@J, MoIT, JCS, JCC	April 2014, one report every three months on a new market, on-going	100K JD/Year	• Number of reports published. • Amount of exports to the countries covered in the reports. • Number of ICT companies exporting to these new studied

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
		the public sector to be able to develop programs that anticipate the global trends.				markets.
		3.3.5 Collaboration with Jordanian expats for Export: Jordanian expats can play an effective role in supporting companies' access to international and regional markets. It is important to identify and recruit and incentivize them to better access markets through mentoring, coaching, deal making and facilitation services.	INT@J, JCI, JCC, JCS	July 2013, on-going	50K JD/year	• Number of collaborative relationships with international companies. • Number of participating Jordanian expatriates assisting in developing exports. • Increase in exports.
		3.3.6 Develop Regional and Global Links for Export: Develop formal export links through partnering with international and regional centers in different countries and different vertical sectors (e-health, e-tourism, contents, etc.). Linkages will act as source of information for the whole sector to disseminate opportunities and information about the markets.	MoIT, JEDCO, JIB, INT@J, JCC, JCS	July 2013, on-going	180K JD/Year	• Number of export links developed in target markets • Increase in regional and international exports by virtue of the links.
		3.3.7 Building National Consortia in Various Fields to consolidate the export capabilities of the ICT sector and sector companies[23]. Consolidation can be achieved through the development of several consortia targeting various verticals to deliver and participate in regional and international tenders.	INT@J, JEDCO, JCC, JCS	July 2013, on-going	100K JD/Year	• Number of consortia developed to address specific verticals. • Number of tenders won because of consortia.

[23] To include as well ICT-enabled BPO and digital content companies.

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
		Consortium members should have complementary competencies and engagement of start-ups. Members should provide complementary products/services for the entire value chain of their target project/market.				
		3.3.8 Finalize establishing a National Software Quality Accreditation and certification center.	RSS, MoICT, INT@J	April 2013 (till the end of year)	None	• Number of software companies accredited/certified • Number of accredited products exported
	3.4 National export house to develop markets for Jordanian ICT companies.	3.4.1 Establish a national ICT export house[24] funded by the private sector and managed as a profit making entity, focusing on the markets identified by Export Market Reports.	INT@J, INT@J members, JCS, JCC	September 2013, six months to establish	JD 200K per year.	• Exports to identified markets.
Risks	1. Intersections do not occur between ICT and sectors. 2. Challenges are not identified and/or sectors are unable to identify/recognize challenges related to intersections. 3. ICT companies do not take on intersections' challenges because of unwillingness to invest in new product development often because of poor profit margins. 4. Inability of local ICT companies to work within consortia. 5. Local inability or desire to use export assessment tools such as export market reports. 6. Export subsidies are not fully exploited. 7. Inability to find funding from private and/or public and donor sources 8. Inability to develop and implement an ICT companies rating model. 9. Inability to finalize establishing and operate a Software Quality Accreditation and certification center.					
Risks	**Importance**	**Actions**				
1.	High	Continuous sector-ICT meetings to identify sector challenges a successful company-company combinations to address challenges and then promote the results of sector intersections.				

[24] To include as well ICT enabled BPO and digital content.

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
2.	High	Facilitated meetings to assist participants to identify challenges/issues facing sectors and selecting possible avenues for product or service development .				
3.	High	Research and development Funding made available to subsidize the cost of new product/service development which meets identified sector needs.				
4.	Medium	Communicate to local ICT companies the mismatch between many export opportunities and the size of most local ICT companies. Explain the mechanics of working within a consortium as well as the required technical standards which need to be adopted to make the consortium effective.				
5.	Medium	INT@J to work with the ICT sector on how to identify and prioritize export market opportunities using export market reports.				
6.	Medium	If export subsidies are not fully exploited than it is likely that the process of obtaining the subsidy is either not clear or difficult to achieve by companies seeking the subsidy. As such INT@J, JEDCO and/or JIB should communicate the process and requirements to interested companies through a workshop as well as receive feedback on the application process itself.				
7.	High	Need to set priorities with existing GoJ funding (JEDCO, JIB and/or MoIT) Seek out funding from MoPIC and international donors to address prioritized needs. Seek out funding from JIB/JEDCO and private sector ICT firms.				
8.	Medium	Need to identify rating system importance to boost maturity of companies and enhance their exporting competitiveness				
9.	High	Need to advocate the importance of such a center in enhancing the export opportunities of companies.				

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
4 Maintain and develop a competitive telecommunication infrastructure to support continuous private ICT sector innovation and to serve local and regional ICT markets	4.1 Update ICT infrastructure to be an enabler for continuous innovation in technology trends: • NGN, • LTE and Cloud computing) and applications such as: • e-commerce,	4.1.1 If deemed commercially feasible by the operators/investors; Installation of national Internet Exchange Point (IXP) through which ISPs exchange Internet traffic between their networks.	TRC[25], Network operators	July 2014 Duration: 1 year	2 Million JD	• Installed IXP. • Percent reduction of local internet traffic using international bandwidth. • Improved speed of local internet traffic.

[25] TRC role is to ensure the existence of regulations that encourage the creation and expansion of local/regional (IXPs).

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
	• e-government, • e-health, etc.					
		4.1.2 If deemed commercially feasible by operators/investors; upgrading the existing public telecommunications network to an advanced NGN network to decouple service provision from transmission and provide open interfaces. The network should support a wide range of services, applications and mechanisms based on service building blocks (including real time/streaming/non-real time services and multi-media) and become a platform for advanced ICT services. It is suggested is to start at first with the upgrading of the existing networks in the business districts of Amman After the business districts are covered, nation-wide coverage of the NGN network in 4 years' time.	TRC[26], Network operators	July 2014 Duration : 4 years	60 - 80 Million JD (if deemed commercially feasible by the private sector)	• Upgraded PSTN to an advanced NGN standard.
		4.1.3 Organization of 4G frequency auction.	TRC	July 2013 duration three months.	None	• 4 G/LTE license Granted.
		4.1.4 If deemed commercially feasible by operators/investors; Upgrading existing mobile networks to LTE based network: LTE can be understood as a continuum to primarily further improve and increase the	TRC[27], Network operators	July 2013 Duration : 4 years (to include different operators)	100 to 120 Million JD (if deemed commercially feasible by the	• Upgraded mobile network to 4G/LTE • New provision of services • Reduced prices to

[26] TRC role is to develop and maintain a proactive, forward-looking regulatory framework that takes into consideration issues that will have significant benefits for Jordan by creating an environment that will encourage the development and deployment of converged IP-based networks including Next Generation Networks (NGNs)

[27] TRC role is to develop and maintain a proactive, forward-looking regulatory framework that takes into consideration issues that will have significant benefits for Jordan by creating an environment that will encourage the development and deployment of converged IP-based networks

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
		wireless connectivity bandwidth rate, but also facilitation for a truly IP-based gateway solutions to the core network (=NGN)			private sector)	consumers
		4.1.5 If deemed commercially feasible by operators/investors; Establish a regional cloud computing center: The objective is to establish a cloud computing center for Jordan and the region. This is done in anticipation of increasing domestic and international demand for cloud computing services (SaaS, IaaS) and to improve marketing of the Jordan IT industry (24/7) service supply; fast back-up recovery; fast software integration; cost efficient operation for industry and customers, etc. Cloud computing center **could** facilitate domestic service supply by government but also private sector.	MoICT, TRC[28], Network operators, ICT Companies, INT@J	October 2014 Duration: 1.5 years	20 – 30 Million JD (if deemed commercially feasible by the private sector)	• Established cloud computing center in Jordan.
	4.2 Private sector exploitation/use of NBN	4.2.1 Facilitating partial or complete private sector exploitation/use of NBN.	INT@J, JCS, JCC, MoICT, TRC	January, 2014 (six months)	100 K for assessment and study	• Private sector use of existing NBN infrastructure for new service provision. • Private sector investment in completing defined spoke of the NBN
	4.3 Unbundled and shared access to local loops and sub loops	4.3.1 Ensuring the provision of physical network infrastructure access services such as Local Loop Unbundling and all forms of unbundled and shared access to local loops and sub loops at each feasible	TRC, Telecom Operators and Service Providers	January 2014, six months	None Required	• Local loop unbundled at feasible locations • Access to associated facilities and services on a nondiscriminatory

[28] MoICT and TRC roles are to develop and maintain a proactive, forward-looking legal and regulatory framework that takes into consideration issues that will have significant benefits for Jordan by creating an environment that will encourage the development and deployment of converged IP-based networks

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
		location including access to associated facilities and services on a nondiscriminatory basis				basis
	4.4 Infrastructure and facilities sharing	4.4.1 Enforcing infrastructure and facilities sharing between operators, and encouraging sharing of facilities with public utilities (such as electricity providers), at reasonable prices and conditions, in order to reduce the costs of providing and extending Internet service.	TRC, Telecom Operators, Public Utilities	on-going	None Required	• Number operators using existing telecom infrastructure/facilities. • Number operators using existing public utilities infrastructure/facilities
	4.5 Implementing Number Portability	4.5.1 Implementing number portability, if deemed feasible, to facilitate customer choice among telecom service providers.	TRC, Telecom Operators	Jan 2014 duration one year	2 Millions[29] (subject to feasibility)	• Number of mobile users changing operators.
Risks	1. Proposed investments not seen as attractive to investors, operators and the private sector. 2. TRC not empowered to ensure unbundling the copper loop, or enable other operators to make use of existing national infrastructure such as towers, ducts, etc. to provide new and value added services. 3. Private sector not interested in exploiting/using NBN					
Risks	**Importance**	**Action**				
1.	High	• TRC, MoICT, and INT@J to identify and communicate similar existing modalities in international markets. • MoICT/TRC and JIB to work attract international investors and operators for this opportunity.				
2.	High	.If TRC is not sufficiently empowered to facilitate increased competition, MoICT and TRC to advocate for the modification of TRC's mandate. Advocacy can be done in coordination with all stakeholders. The main message should be that TRC can be an effective tool to facilitate increased innovation and sector growth.				
3.	High	MoICT to communicate attractive revenue sharing schemes to increase private sector interest in completing the NBN as well as exploiting its capacity for GoJ and private sector use.				

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators

[29] This is an estimated cost of the central database and clearing house, it does not include individual operators' costs.

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
5. Develop agile national professional training and certification capabilities	5.1 Work with all existing training and educational institutions to provide agile, sector responsive technical and managerial training to address the needs of the local ICT industry.	5.1.1 Identify, validate and document training and technology needs from ICT sector players through sector focus group sessions and questionnaires[30].	MoICT, INT@J, JCS, Private Investors	January, and then on a regular basis (once annually).	20 K JD/year	• Number of new skills/certifications identified by the industry as being required. • Number of training courses which provide these skills provided through and existing institution, INT@J/JCS or a newly stabled institution. • Number of trainees successfully completing the training. • Number of trainees getting certified. • Number of individuals hired after successfully completing the offered training.
		5.1.2 Identify local, regional and international institutions/individuals that can supply the required training and provide certification if necessary.	MoICT, INT@J, JCS, Private Investors, Existing Universities and Educational Institutions	July 2013, continuous	None	
		5.1.3 Contact existing educational institutions (PSUT, JUST, U of J, Al-Quds College, EJABI, RSS, etc.) to determine willingness to host or provide professional training and certification on behalf of the sector. This could become a lucrative source of additional income for these institutions.	MoICT, INT@J, JCS, Private Investors, Existing Universities and Educational Institutions	July - September 2013 (then on-going)	Estimated funding required per course is JD 12,000 to JD 30,000 per course for up to 25/30 trainees. Cost depends on the type of certification required. CMMI is very expensive for example. If existing institutions (PSUT, JUST, etc.) agree to participate, funding requirements will need to cover	

[30] May consider ICT enabled BPO and digital content companies.

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
					training (trainer fees), room and board, and food/drink for participants. Venue will be provided by the university/college	
		5.1.4 The private sector to define a professional IT skill qualification framework and a model CV for workers in the ICT sector. Private sector companies to work with university professors, educational institutions and training companies to select/develop the required courses to develop the required skill sets. Private sector may be called upon to provide training.	INT@J, JCS, Private companies, Existing Universities and Educational and Training Institutions	July 2013, duration four months to develop first set of model CVs and required courses. Repeated bi-annually)	100 K JD/ bi-annual	• Modifications/additions to the existing university curriculum. • Percentage of graduates who find jobs. • Speed at which ICT graduates find employment.
	5.2 Establish and operate a training and certification (Bridging) center/program to meet local and regional ICT technical and managerial needs.	5.2.1 Establishment of a professional training and certification (Bridging) center/program . (Existing Bridging programs are to integrate under this center)	MoICT, INT@J, JCS, Private Investors	January 2014, (within two years the center is to be established.)	Min. 1M JD	• Number of new skills and certifications identified by the industry as being required. • Number of training courses which provide these skills provided through and existing institution, INT@J/JCS or a newly stabled institution. • Number of trainees successfully completing the training. • Number of trainees getting certified. • Number of individuals hired after successfully

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
						completing the offered training.
	5.3 Maintain knowledge of what the ICT sector requires in terms of skills locally and regionally.	5.3.1 Conduct at least one study every year to identify the skills needed to meet the needs of the local and regional ICT sector[31] taking into consideration expected industry trends and shifts in these trends.	MoICT, INT@J, JCS Private ICT companies Existing Universities and Educational Institutions	Starting July 2014, duration six months.	100 K JD/year	• Publication of an ICT sector skills needs study
Risks	1. Existing universities unwilling to take on the needed role for continuous education and professional development. 2. Private sector investors unwilling to support the establishment of a training and certification center. 3. Private companies and professionals unwilling to pay for training or unwilling to attend.					
Risks	**Importance**	**Actions**				
1.	Medium	Private sector to invest in an independent institute. INT@J/JCS to provide training at various venues when needed (virtual institute).				
2.	Medium	INT@J/JCS to provide professional training at various physical offsite venues when needed (virtual or off site institute).				
3.	High	Possible cross subsidies between paying and non-paying trainees. MoL, VTC training subsidy, KAFD, Donor funding, marketing of training to the sector.				

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
6. Stimulate the creation and development of suitable Arabic language and local digital content that is accessible online throughout the Arabic speaking	6.1 Increase awareness among potential users of where and how digital content can be developed.	6.1.1 Hold seminars at universities and high schools where local content developers can speak about their craft, the required skill sets and available opportunities. These seminars and workshops can be communicated as CSR opportunities for local content developers.	MoE, MoHE, MoL, INT@J, JCS, Content companies	October 2013, then on-going	None for GoJ. INT@J members can contribute money and time for seminars and awareness sessions. (How much depends on in how important	• Number of seminars or workshops held. • Number of attending students. • Number of students applying for training and/or education in digital content.

[31] May consider as well ICT enabled BPO and digital content companies

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
region.					this is to the private sector).	
		6.1.2 Develop a national award for content development which evaluates the creativity and innovation in the content as well as the creativity and innovation in the usage of the content.	King Abdulla II Center for Excellence, KACE, INT@J, JCS, JCC, KADF	April 2014, duration six months, then an annual event.	<50K JD per year	• Criteria for the award are well articulated. • Number of individuals and/or companies who compete for the award.
		6.1.3 Integrate ICT use into university curriculum in areas such as journalism (facebook use, twitter use, etc.), drama and the arts which are becoming ICT and digital content heavy. 6.1.3.1 Alternatively use the professional development training through the bridging institute to deliver these courses.	MoHE, INT@J, JCS, JCC, Content developers and development companies, Universities	January 2014, duration two years to develop and accredit the courseware.	200 K	• Number of courses developed for the various specialties (Journalism, art, drama, etc.) • Increase in the amount of Digital content being developed.
	6.2 Improve the regulatory regime to Accelerate convergence between ICT and innovative audio visual and to proactively facilitate content [32]	6.2.1 Identify and prioritize legislative and regulatory gaps between what currently exists in the Jordanian business environment with international best practice to accelerate convergence and content development growth.	MoICT, TRC, INT@J, JCS, JCC, Content developers and development companies	October 2013, duration six months	50 K JD	• Prioritized list of regulatory and legislative gaps which need to be addressed
		6.2.2 Review the appropriateness of the existing publications and audio visual laws to make sure that they do not hinder convergence and content development and identify areas of weakness in these laws.	INT@J, Digital content companies, MoICT, AVC, Department of Press and Publication (DPP), TRC	April 2014, duration 3 months	25 K JD	• List of identified issues.

[32] Accelerating convergence will help in creating a more conducive business environment for digital content development to support sustainable job creation for creative industries

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
		6.2.2.1 Propose amendments to existing laws which affect convergence and govern the content industry to bring them in line with international best practices and to make them as proactive tools for content development (this is to include proposed amendments to the publications and audio visual laws).	MoICT, INT@J, JCS, JCC, Council of Ministers	July, 2014, duration nine months[33].	75 K JD	• Number of suggested amendments.
	6.3 launch a content industry development program	6.3.1 Conceptualize, fund and launch a content industry development program to accelerate digital content development within the local industry.	MoICT, INT@J, JCS, JCC, Content developers and development companies	January 2014, duration two year	200 K JD	• Existence of a content development program, • Number of content development companies benefiting from the content development program.
	6.4 Provide incentives for GoJ entities to develop an inventory of useful digital content.	6.4.1 Provide incentives (E-government award) to GoJ entities to develop, launch and use E-services. Increased Arabic language E-services will create utility for many local users.	MoICT, MoPSD, Cabinet of Ministers	January 2014, duration on-going	50 KJD per year	• Number of GoJ entities applying for the incentives (Award). • Number of E-services which go on-line.
Risks	1. Companies will not invest time to increase awareness among students. 2. ICT is not integrated with existing relevant university curriculum or not accepted as part of the official university or college course offering. 3. GoJ entities not interested in developing E-services. 4. Concerned entities do not review and update legislations & relevant regulations to accelerate convergence and facilitate content development.					
Risks	**Importance**	**Action**				
1.	Medium	• Coordinate with INT@J and communicate the need for local students to understand the new opportunities availed to them through digital content development. Also, use the opportunity to identify what skill sets are really needed (practically) by the digital content developers.				
2.	Low	• INT@J and MoICT should go to colleges and professional training centers to communicate the importance of incorporating the needed digital content courseware.				
3.	Medium	• GoJ should provide training and certification on E-service development to GoJ entities to make them eligible for E-Government				

[33] Suggested timeframe includes submitting suggested legislative amendments to Council and Ministers which forwards it to Opinion and Legislation bureau for revision and finalization before submitting to Parliament. It does not include the revision and approval phase at Parliament.

Strategic Objectives	Initiatives	Actions	Responsible Stakeholders	Start Date & Duration	Resources Required	Key Performance Indicators
		Award.				
4.	High	• INT@J and the industry should advocate with the GoJ on the possibility of losing economic development opportunities and job creation opportunities if concerned entities do not assess and amend if needed legislations & regulations to enable accelerate the delivery of converged services and facilitate content development.				

Annex 1

Timeline for Liberalizing and Privatizing the Telecommunications Sector

Technical development and growth of the ICT industry was enhanced by privatization and liberalization of the telecommunications sector according to the following timeline[34]:

In 1988, a license was granted to Jordan Paging Company to provide paging services.
In 1992, the Ministry of Post, Telegraph and Telephony (MoPTT) was renamed as The Ministry of Post & Communications.
In 1993, Jordan initiated a national development program to increase the penetration of telephony services from 7.8 to 12 lines per 100 inhabitants.
In 1993, the private sector was allowed to invest in telecommunications projects.
In October 1994, Fastlink was granted the first mobile cellular license in Jordan.
In 1995, The Telecommunications Law No. 13 of 1995 was passed, providing the legal basis for reform. As a result, the Telecommunications Regulatory Commission (TRC) was established.
In 1997, the Telecommunications Corporation (TCC) was transformed into a Government-owned company operating on a commercial basis, as a first step towards its privatization, and was then renamed Jordan Telecommunications Company (JTC).
In 1999, MobileCom Company was granted a license to provide mobile cellular services in the Kingdom.
In 2000, Jordan became a full member of the WTO. Therefore Jordan has provided its obligations regarding the telecommunications sector within the presentations made to join the organization, which included fully liberalizing the telecommunications sector by the end of 2004.
In 2000, 40% of JTC shares were sold to a consortium led by France Telecom and the Arab Bank, 8% of shares were sold to to the Social Security Corporation, and 1% to Jordan Telecom Company employees.
In 2002, the Telecommunications Law No. (13) of 1995 was amended by the temporary Law No. (8) of 2002, whereby, the Ministry of Post and Communications was renamed as the "Ministry of Information and Communications Technology (MoICT)". Also, the 2002 Telecom Law emphasized on the independence of TRC, in addition to entrusting the TRC with regulating the Telecommunications and Information Technology services in the Kingdom.
In October 2002, 10.49% of the Jordan Telecom shares were sold in a public offering.
In 2003, the Government Policy statement on the Information & Communications Technology sectors & Postal sector was issued, in pursuit of the implementation of Government obligations towards the WTO to liberalize the Telecommunications sector, which confirmed the government's intention to liberalize the fixed telecommunications sub-sector by the end of 2004 and put an end to the duopoly of the two mobile providers by the beginning of 2004.

[34] http://www.trc.gov.jo/index.php?option=com_content&task=view&id=337&itemid=507&lang=english

In April 2003, XPress Company was granted the first license to provide Radio Trunking services.
In late 2003, the TRC has published its Program for Further Licensing within the Mobile Telecommunications Sub-sector, presented pursuant to the Statement of Government Policy on the ICT Sectors and Postal Sector.
In June 2004, the TRC published a public consultation on the future licensing in the fixed telecom sub-sector after its liberalization at the end of 2004.
In August 2004, Umniah Company was granted a license to provide mobile telephone services.
In October 2004, the Program of Licensing in compliance with the Government Policy on the ICT sectors and Postal Sector was issued, whereby the program clarified the two categories of licenses: individual and class, which will be granted to those willing to invest in the kingdom.
In the beginning of 2005, the last stages of the National Numbering Plan were implemented in regards to mobile telecommunications services by adding a new (8th) digit and by unifying the code for all mobile services to be (07).
In the beginning of 2005, the monopoly of Jordan Telecom Company in providing fixed telecom services was ended; and the fixed market was fully opened.
In May 2005, Batelco company was granted the first individual license allowing the company to provide fixed telecommunications services.
In 2005, (26) licensees were transitioned into the new form of Class license in accordance with the Integrated Licensing and Regulatory Regime.
In 2006, Fastlink, Umniah, and XPress companies transitioned to the Integrated Licensing and Regulatory Regime.
In June 2006, the government decided to sell its shares of Jordan Telecom amounting to 41.5%. These shares were sold to France Telecom and some local and regional parties, and the rest of the shares were listed in Amman Stock Exchange market. However, the sale process did not fully succeed, thus the government has retained 11.6% of company shares.
In 2006, TRC issued the tender documents for the provision of (Fixed Broadband Wireless Access-FBWA) according to the Council of Ministers' decision dated 12/9/2006, containing the approval of a "method of General bidding" for granting licenses for the use of radio spectrum in the area of Fixed Wireless Broadband Access Services. Later, 5 companies were granted radio spectrum licenses to provide FBWA Services .
In May 2007, the Statement of Government Policy 2007 on the Information & Communications Technology & Postal sectors was approved according to the Council of Ministers' decision dated 29/5/2007.
In June 2007, the transition of non-class licensees to the Integrated Licensing and Regulatory Regime were completed the by the transition of both Jordan Telecom and MobileCom companies.
In January 2008, the Government completed the sale of its Jordan Telecom shares. Such that 51% of company shares became owned by France Telecom, and the rest of the shares are distributed between the Social Security Corporation, the Noor Financial Investment Company (Noor), the armed forces and security agencies, leaving 7% available for exchange in Amman Stock Exchange market.
In June 2008, TRC announced its intention to introduce 3G services in Jordan.
Mid August 2009: TRC granted a third generation (3G) license to Orange Mobile Company.

Annex 2

Limitations

Roles of the Public and Private Sectors:

A national strategy requires that both the Public and Private sectors work together to achieve its designated goals and to execute the defined activities. All the activities described in the National ICT Strategy are activities of national importance. Since the GoJ may no longer be actively involved in making infrastructure investments, the ability of both the telecommunications and IT sector to benefit from new telecommunication investments depends on the how investors/operators view the commercial viability of the investment. For this reason, it will be required that the government enables the development and communication of attractive investment opportunities for the telecommunications sector, the IT sector, and the national economy to continue to grow and be competitive.

Many of the actions require substantial financial commitment such as telecommunication infrastructure investment. With Jordan's open telecommunication sector, such investment requirements can only be identified as opportunities. As such, they cannot be imposed on operators or investors. Therefore, whether such investments are actually made depends on whether investors/operators perceive the commercial viability of the investment. **If the defined activities are not funded, then the objectives of the strategy will not be achieved**. The public and private sector should consider approaching international corporations to invest in any opportunities which cannot be funded locally as well as jointly approach the Ministry of Planning and International Cooperation (MoPIC) for donor contributions to help fund identified financial shortfalls in the strategy.

As such, the responsibility of most investments falls on the private sector, particularly those related to infrastructure, education and product and service development. It is the role of government to provide and maintain a business environment which is conducive to repeated private sector investment. Thus, the ability of the strategy to be implemented will be predicated on the ability of both the public and private sector to work responsibly towards its implementation.

Role of Government Must Change:

Although the Jordanian ICT sector shows much promise, the way in which the sector must be developed needs to change. In the past the GoJ was considered as the engine of economic growth. Most companies catered to large government consumption which was enabled and supported by external financial sources from donors. Since the late 1980s, donor funding has declined, yet many private sector companies still look to the public sector as the engine of economic growth and have not developed alternative business strategies to compensate for reduced government spending.

Since the GoJ can no longer play the traditional role of economic engine (financier of growth) it must develop a new, creative and proactive role to attract investment (DDI and FDI) to update infrastructure and to facilitate economic growth. GoJ, as mentioned previously, should consider innovative licensing and partnership agreements such as BOO, BOT, BOOST, etc., as well as establishing localized technology infrastructure hubs such as technology corridors and techno poles. Moreover, GoJ should help support the private sector to develop export capability, possibly through the establishment of a single ICT focused export house, to help promote IT sales and IP reach into regional and international export markets. Moreover, the definition of national ICT should be revised to investigate expansion to include online mobile content development and outsourcing service (business process, knowledge process). Sector, support could be through provision of technical assistance to develop a category of IT marketing professionals well versed in designing and executing IT export plans which culminate in secured individual sales (through JEDCO) as well as support in identifying and attending international trade fairs (through JIB).

The Telecommunication Regulatory Commission (TRC) should investigate and adopt, wherever possible, advanced spectrum management principles, including but not limited to: a technology and service neutral approach to spectrum, spectrum reuse and spectrum sharing and the potential for secondary spectrum markets, except where these would be inconsistent with applicable international agreements or would create undesirable affects, and when and where market conditions allow. This is required to improve the efficiency of using spectrum which is a limited public resource and to encourage launching new services that will enhance and support the technical development and evolution of the Jordanian IT sector. Moreover, the smooth availability of new telecommunications technologies is likely to stimulate local telecommunications companies to develop and introduce new value added services in their service offerings. The development of such new value added services will in turn improve the competitiveness of the IT sector and improve the probability of IT export development and sustained job creation.

Agile Infrastructure Development:
Maintaining internationally relevant and competitive infrastructure (becoming/remaining an early adopter) will assist not only in providing new opportunities for the local ICT industry to grow but also can create opportunities for international operators and equipment suppliers to develop regional technical ability in Jordan. International operators can develop a competitive international/regional technical ability by utilizing Jordanian engineers and technicians.

This previously happened within the ICT sector with Zain which regionally expanded their network by utilizing Jordanian engineers and technicians to install, maintain and launch GSM services in Africa, Bahrain and Syria. CISCO now has their largest technical assistance center established in Jordan using Jordanian engineers and technicians. Having access to Jordanian technicians and engineers will enable cheaper roll out as well as faster technology adoption in the region.

Although the GoJ has started investment in the NBN, as a private network for the government, the investment is not complete. NBN initial scope was to provide easy access to E-enabled services. Although eight public sector universities, 643 schools in the Kingdom, 93 government

entities have been connected via the NBN, there exist more opportunities which have yet to be developed and exploited. The GoJ decided to invest in NBN prior to the development of mobile 3G technology. Although the private sector was invited to invest in NBN infrastructure, there was no private sector appetite for such an investment. This led to the GoJ undertaking the investment independently including the investment for the NBN expansion and completion.

NBN needs to be completed independently by government or in cooperation with the private sector (local and/or international) and new opportunities to develop and launch new products and services need to be identified. NBN can be completed and technically exploited once service priorities have been identified. It is the responsibility of the Ministry of Public Sector Development (MoPSD), in collaboration with MoICT and other relevant government entities to set priorities with regards to developing the public sector and utilizing ICT for that purpose. Identified areas of priority for E-services will enable the GoJ to recruit private sector investment (local and international) and/or technical talent to deliver these E-services to identified stakeholders. How the GoJ and private sector (local and international) will agree to deliver E-services will depend on the proposed models (outright purchase, partnership, revenue sharing, etc.).

Furthermore, the creation of focused, targeted infrastructure development opportunities through PPPs (BOO, BOT, licensing, etc.) by the GoJ will facilitate the next regional technology drive to originate in Jordan. This can be facilitated by international companies which are attracted to Jordanian technology pilots or demonstrators to serve Jordan and to build technical skills to serve the region.

The GoJ and the private sector telecommunications sector should form a national telecommunications technology task force to determine how best to leverage existing national communication assets to deliver the desired national services. Such a task force could recommend to development of hybrid solutions building on available governmental and private sector capabilities. This type of technology intersections will be very useful in improving national technical capabilities as well as improving the robustness of the existing telecommunications systems.

Company limitations within the sector:

Over 99.6% of registered Jordanian companies (outside of the agricultural sector) are considered MSMEs [35]. Small size indicates that these companies have poor or non-existent corporate/company processes and procedures. Small size also indicates that it is difficult to bolster local ICT sector sales from local private sector MSME consumption. As such, there is a need to create and sustain export led growth.

Since most ICT companies are MSMEs, there is a need to provide assistance to enhance their maturity, ensure their sustainability and develop sector exports. This will require Jordan

[35] http://planipolis.iiep.unesco.org/upload/Jordan/Jordan_NHDR_2011.pdf

developing a national ICT identity which reflects the most common and dominant characteristics of the Jordanian ICT sector. The sector should consider establishing a private sector funded ICT focused export house which internationally markets and promotes the best ICT products which Jordan has to offer. The private sector could approach government sponsored funds (VC) and funding agencies as well as international donors to invest in this house. The export house would promote adherence to international standards on ICT products to be exported assisting local companies to develop and improve their current products and services. This will of course increase their international competitiveness over the long term.

Currently, most Jordanian ICT companies develop products and/or services according to the intermittent demands of clients across many sectors. The discontinuous demand of Jordanian companies for ICT solutions has prevented most Jordanian companies from developing cumulative experience in any one particular sector (although they do have experience across multiple sectors). Companies are usually unable to build cumulative experience which could become a sustainable competitive advantage.

Individual companies rarely productize their technical and sectoral capability. This means that companies rarely benefit from scale because they continually reinvent the proverbial wheel. As such, the ICT sector has fragmented experience across most companies. The sector needs to identify ways and means to identify and consolidate such experience to develop sustainable competitive advantage. CMMI and similar certifications across many companies might facilitate increased cooperation among ICT companies and improve harvesting of Jordan's fragmented ICT capability to develop internationally sustainable national ICT competitiveness.

Limited Labor:
Jordan has large numbers of educated technical/non-technical labor. Since most established Jordanian businesses are micro, small or medium enterprises, the level of value adding which they provide is generally low. Many of Jordan's educated demographic are currently unemployed because local companies do not need or cannot make use of educated or trained labor to add value. Although, specific low to medium value adding ICT sub-sectors such as call centers can supply job opportunities for this educated group, the reality is that Jordan's labor force is small in absolute terms. More populated countries like Egypt and India will eventually displace Jordan, if all that is required are numbers of laborers. Because of this demographic reality, Jordan cannot focus on low cost ICT services like call centers only. National effort must focus on ICT sectors that are knowledge based, that have high added value such that Jordan can develop and/or maintain a competitive advantage.

To enter in and maintain this competitive direction, Jordan has to work diligently and purposefully to build its education, professional training and certification capabilities to develop and maintain a technical edge in a few select verticals. Jordan needs to start in areas of traditional competitive strength and build cumulative capacity and capability through the development of intersections between ICT and these sectors:

- Medical/Healthcare
- Pharmaceuticals
- Architecture and engineering

- Higher education
- Clean technology
- Digital content
- Tourism
- Finance and Banking
- Education

Annex 3

Turning Challenges into Opportunities

Due to the intermittent demand for ICT products and services by the local Jordanian economy, the ICT sector generally lacks sector focus and deep sector knowledge, two key and necessary attributes of a competitive ICT vertical. The challenge of lack of focus arises because many Jordanian ICT companies start out as programming shops that develop competencies and marginal sector knowledge as intermittent opportunities arise instead of planning and diligently building sector relevant products, the company identity and deep sector knowledge. This may be because that most ICT companies are developed by ICT programmers, engineers and technicians instead of businesspeople.

Fragmented Exports:
Historically, the ICT sector has been tactically focused on maintaining cash flows instead of being strategically focused on developing, articulating and communicating deep competitive vertical knowledge in specific sectors. Most companies' business and sales efforts have opportunistically darted between government procurement (traditionally the largest national consumer), intermittent private sector corporate needs and what medium and large enterprises see as being in vogue (ERP, CRM, etc.). Therefore, few companies have been able to develop cumulative experience in specific sectors or functions. This has led to:

- No sustainable competitive advantage
- No national identity which reflects national competencies or capabilities
- No/few well-known companies, products or services

Lack of diligent market focus has produced ICT companies with little company knowledge of market needs (companies wait for a requirement instead of being proactive and identifying what companies or sectors might need). This knowledge is needed to invest in developing products (reflecting a sector specific or functions specific focus) and to provide a competitive offer which addresses defined market/sector needs.

Need for Long Term Market Focus:
Jordanian ICT companies need to develop their skills to focus on marketing and market development (long term strategic effort) instead of being mostly focused on technical development and sales (both short term, reactive, tactical efforts). Only with a strategic and long term proactive ethos among ICT companies can cumulative knowledge be developed and contained within competitive products. Without such an ethos, knowledge is squandered at the company level and technical knowledge is continually reinvented when needed. This prevents ICT companies from benefitting from scale opportunities. This has led to most Jordanian companies not being able to build, demonstrate and communicate cumulative sectoral/vertical knowledge making the ICT sector's identity and value proposition difficult to communicate. As such, the Jordanian ICT sector has been limited in its ability to articulate and communicate a defined competitive capability.

Investment Promotion:

The Telecommunications sector in Jordan has grown to a great extent because of foreign direct investment (FDI). FDI has been important not only for the investment which it brings but also for the operational expertise which accompanies the investment. If the telecommunications sector is to continue to grow and expand, the GoJ has to develop attractive investment opportunities (partially based on private sector input and initiative) which will continue to attract foreign operators and investors as well as facilitate local domestic investment. Attractive investment opportunities are based not only on the provision and management/operation of new technological infrastructure but also on the development and launching of value adding services.

Investment in domestic IT companies should also be promoted. This can be done in cooperation with the JIB and INT@J, when a clear and competitive value proposition can be defined. A value proposition will be easier to define, defend and promote for investment when clear specialized utility can be demonstrated. This will be easier to do after successful intersections with other competitive economic sectors yield useful products and services.

Attracting investment is not only an issue of identifying and promoting lucrative business opportunities but is also intimately related to providing and maintaining a competitive business environment. GoJ needs to develop a competitive investment policy for ICT and Business Process Outsourcing (BPO). Increasingly, many local Jordanian IT companies are relocating to more competitive business environments where laws and regulations are clear and equitably and consistently applied across all companies. Local telecommunication companies are also unhappy with the current business environment. This unhappiness will frighten off foreign investors from necessary and required telecommunications infrastructure development in Jordan. An unattractive and inconsistent business environment will prevent Jordan from maintaining a healthy and competitive telecommunications infrastructure will in turn will dramatically hurt the IT sector.

Jordan needs to develop its business environment to be competitive on an international scale. Laws must be internationally competitive and equally applied across all businesses. Not doing so will facilitate greater migration of Jordanian companies, management and capital to more attractive environments. This will further increase unemployment and reduce exports, putting Jordan in an increasingly precarious economic and social position.

Business and Investment Environment:

Moreover, successful and sustainable sector investment (local and foreign) is intimately tied with competitiveness of the business environment. Taxation (direct and indirect), licensing and fee regimes need to be unambiguous, consistent and transparent. GoJ needs to publish how taxation, licensing and fee regimes are applied. This will prevent inconsistent interpretation by companies as well as government employees and provide a standard which the private sector (local and foreign) can depend upon. Moreover, publication will provide the GoJ and the private sector a reference to review and evaluate the Jordanian investment environment to maintain its regional and international competitiveness. This is extremely important for the sector, JIB and various business associations who will be responsible for promoting local and foreign investment to develop the sector. Of particular importance will be ICT and BPO investment.

Once a stable and attractive investment environment secured, a strategic ICT sector investment plan should be developed between INT@J, JIB and the Chambers of Trade and Commerce which will highlight opportunities for local and foreign investors. The plan should identify target markets and potential partners for investment.

Intellectual Property (IP) Recognition:
The international ICT sector is an intellectual property (IP) driven and supported industry. Jordan has little IP registration and publication among its private sector ICT companies. There is a profound need to identify what latent IP already exists within industry, harvest what exists among Jordanian companies and publish the IP and product listings. IP publication will leverage the results of where existing ICT companies have been historically focusing effort (fragmented and opportunistic technical effort). IP publishing will help communicate and develop an international awareness of Jordan's technical capability and competence. This should be predominantly driven by the private sector as they have the most to gain from IP registration.

Regretfully, there is little awareness about the importance of IP registration and productization in the sector. There is a serious need to develop awareness of hidden and under promoted latent conceptual and technical assets. As such there is a need to create awareness among ICT companies and management about the importance of IP. Paired with awareness is also the desperate need for training which explains the procedure for IP searches and registration, including who and where such services can be obtained in Jordan (i-Park, law firms, etc.).

New Paradigm is Required to Become an Early ICT Adopter:
Historically, Jordan has been a regional technology leader and early technology adopter and adapter. Jordan was one of the first Arab countries to introduce mobile telephone in the 1980s with a car based MTS (Mobile Telephone System) system. Additionally, Jordan was one of the first Arab countries to develop television broadcast capability and one of the first to introduce color television broadcasting in the mid- 1970s. Jordan's early technical adoption fueled consumption and technology adoption in other Arab countries, particularly the GCC. Jordan was among the first GSM adopters in the Arab region and one of the first Arab countries to enact a modern telecommunications law and develop a comprehensive sector policy. Jordan's early adoption fueled the development of qualified and certified technical staff that would often facilitate regional technology adoption. Jordan's consistent early adoption of new technologies was also fueled and supported by government investment.

Over the past 20 years, Jordan has fallen behind in the early adoption leadership role. Jordan is no longer seen as a dominant source of technology enabling/facilitating labor/skills. As the government can no longer play the role of technology adoption investment engine, the relationship between the private sector and government must change. Government must evolve to become a facilitator for economic growth and technology adoption with clearly defined policies, defined growth targets and suggested national ICT projects (whether funded by GoJ or through partnerships) to support and direct sector growth.

Instead of the GoJ being the lone enabler for procuring and adopting new technology (infrastructure mostly), government's role must evolve to identify and create new market entry

possibilities, maintain an environment that is inductive to needed and new ICT infrastructure investment business opportunities for the private sector (local and international) and promote competition among players within the sector. Items such as the possibility of full foreign ownership should be investigated thoroughly. Also rules to facilitate the sharing of national infrastructure such as ducts, towers, etc., should continue to be adopted and new mechanisms for managing radio frequencies should be investigated and adopted whenever possible to encourage service providers to compete on service development. The development of new opportunities and increased competition within the sector will help build regional technical capacity for Jordanian ICT companies and long term partnership opportunities with local, regional and international operators and technology providers. Facilitating competition among operators (for example through policies which mitigate the effects of dominance and reduce the barriers to market entry) will increase competition among operators. Over the long term increased competition will facilitate the development of product partnerships between telecommunications companies and IT companies to develop improved value added services delivered over telecommunication networks. These services will of course also have export potential for the telecommunications providers.

Convergence:

Convergence can mean two things: 1) The convergence of ICT with different sectors of the economy and society (ICT and Healthcare/Pharmaceuticals, ICT and education, etc.) and 2) it can be understood to mean the ability of different networks to carry similar kinds of services (*e.g.,* voice over Internet Protocol (IP) or over circuit switched networks, video over cable television or Asynchronous Digital Subscriber Line (ADSL) or, the ability to provide a range of services over a single network.[36] For the purpose of this section, convergence will be related to point number two or the ability of different networks to carry similar services or the ability to provide a range of services over a single network.

The reason convergence is important, is that communications legislation often limits the types of services which can be provided with a given license using a public asset (spectrum, fiber optics, copper, etc.) . The issue is that technological and service development is impeded through such licensing and legislative limitations. These types of impediments limit competition and therefore hinder economic and technological growth. Therefore, value added services delivered over any network should be open, if possible, to all network operators to facilitate increased competition among the operators

Convergence is accelerating. Existing networks are modified to offer new services (*e.g.*, upgrade of telephone networks to offer ADSL, alteration of electric power networks to offer broadband services, and the modification of cable networks to offer interactive services). Convergence is also possible with wireless broadband technologies. Different network infrastructures can now provide numerous new services. Cable television operators can now offer consumers voice, Internet access, and broadcast services over the network as a bundled package of services, and for a monthly fee. Mobile service providers may offer a subscriber data and video services, as well as voice services, and digital television (DTV) providers are offering interactive services.

[36] http://www.ictregulationtoolkit.org/en/Section.2084.html

Governments and regulators with limited recognition of the new opportunities derived from convergence will hinder investment, job creation and economic development opportunities.

There is a list of issues which regulators now need to consider[37]:

Issues for Regulators to Consider with Regard to Convergence
1. Does the regulatory framework facilitate the provision of different services over different platforms (*e.g.*, technology neutrality)?
2. Does the regulatory framework support full competition?
3. Does the regulatory framework allow service providers to offer multiple services?
4. What are the regulatory policies for these new technologies and services with regard to numbering, spectrum, universal service, and interconnection?
5. Does the country's legal framework contain the necessary legislation to support an ICT environment (*e.g.*, intellectual property laws, computer crime, electronic transactions, data privacy and security)?
6. How much turn-around time and process is required for the country's legal framework to respond to future changes in the sector?

The combinations of services delivered over the same platform challenges common perceptions about the most appropriate method to license and regulate ICT service providers. Historically, regulatory frameworks were designed when clear functional differences existed between services and infrastructure. These regulations are increasingly inadequate for dealing with today's world.

Regulators and policy-makers are responding to challenges presented by the ICT sector in a variety of ways. First, there is an increasing shift towards equal or technology-neutral regulatory treatment of different information and communications infrastructure. For example, the European Union (EU), India, and Kenya have introduced/are introducing, legal frameworks and regulations to regulate aspects of convergence through a technology neutral and flexible approach.

Second, Malaysia, Singapore, and the United Kingdom, are modifying the structure of their regulatory authorities by authorizing them to regulate the telecommunications, broadcasting, and information technology sectors. Governments are now drafting and implementing new laws and regulations to create the necessary enabling legal framework to support the ICT sector. These laws and regulations deal with issues such as content, data protection, intellectual property, security, and computer crime.

An alternative approach to convergence is to accommodate it within the existing legal and regulatory framework. This is only effectively possible in countries where there are no barriers to market entry or restrictions on the types of service being offered. Even though operators can, and do, offer multiple services over multiple platforms in fully competitive markets, it is a cumbersome process requiring multiple licenses and regulatory oversight by different institutions.

[37] http://www.ictregulationtoolkit.org/en/Section.2084.html

Spectrum Management:
Spectrum management is the process of regulating the use of radio frequencies to promote efficiency and to benefit the society in general. The radio spectrum refers to the frequency range from 3 kHz to 300 GHz that can be used for wireless communication. Demand for services such as mobile telephones, mobile internet, etc., has required changes in the philosophy of spectrum management.

Demand for wireless broadband has soared due to technological innovation, such as 3G and 4G mobile services, and the rapid development of wireless internet services. Historically, spectrum has been assigned through administrative licensing. Signal interference, particularly when using analog technologies, was once considered as a major problem of spectrum use because of technological limitations. As such, exclusive licensing was created to protect licensees' signals. The practice of licensing discrete bands to groups of similar services is giving way, in many countries, to a spectrum auction model that is intended to speed technological innovation and improve the efficiency of spectrum use. During the experimental process of spectrum assignment, other approaches have also been carried out, namely, lotteries, unlicensed access and privatization of spectrum. Spectrum parity ensures a level playing field for operators and ensures that competition is based on innovation and service provision.

In Jordan access to the radio frequency spectrum is the domain of the TRC. Much of the radio frequency spectrum has been released by TRC for commercial use, but much of the spectrum remains allocated for military use. As the demand for radio spectrum increases for commercial exploitation, there will be increasing demand on the military to release more of their spectrum allocation for the public good. Although improvements in frequency utilization can be achieved by going to digital transmission (instead of analog thus freeing up the spectrum for other uses ' "the digital dividend"), the high rate of growth of ICT opportunities will likely put pressure on TRC to attempt to release more of the available spectrum. This will require that TRC and the industry to come to some sort agreement with the military on spectrum use such that economic benefit from this public good can be maximized without compromising national security. The TRC and the military might be able to define a set of national security events or criteria (crises) in which commercially exploited radio spectrum can be temporarily returned to the military for exclusive use.

ICT Security:
Over the past few years, telecommunication regulators have been approached by market players expecting regulators to be increasingly involved in ICT security issues. Network and information security have always been important in telecom regulation, but the importance of security changes character with evolving technologies. Security related to current communication systems, including Internet, are broader than security issues when telephony was the most dominant service. Current information and communication technologies raise a large range of questions because Internet is a more open environment than earlier communication systems; wireless communication also raises new security problems; and networks and services are increasingly international, constituting new security issues.

Today, societies are far more dependent on technology facilitated communication than before. Numerous societal, industrial and commercial processes and functions depend on efficient,

secure and well-functioning communication infrastructures and services. This relates to business-to-business transactions and interactions because they are increasingly conducted on networks and because business-to-consumer transactions/interactions are based on an increasing number of network-based applications. It also applies to residential and non-commercial communication. Seen in connection with the more open and thus more insecure communication environments, this is a significant challenge, where regulation has a role to play.

To facilitate greater ICT intersection with the economy and convergence across media will require that the Jordanian national ICT system (infrastructure and standards) be seen as secure. Investors, operators and users will only rely on ICT if it is perceived and demonstrated as secure. TRC and the GoJ should consider adopting national standards for ICT security, which can be adopted and implemented by companies and operators depending on the standard of service which they will implement. This will require that the GoJ and the TRC communicate the necessity of security to the operators and users to increase their awareness and to facilitate increased ICT use in commercial and social transactions.

Education, Training, Professional Development and Certification:
A competitive ICT sector requires an educated, trained and certified workforce. The fast pace of change in ICT has put pressure on Jordanian universities to continually graduate individuals with relevant and useful skills. Poor agility in upgrading technical education to remain relevant and responsive to sector needs is a structural impediment to sustainable competitiveness. Many Jordanian universities have been too slow to modify their curriculum to maintain sector relevance. Universities have been unable to adapt their curriculum fast enough to keep up with sector needs. There is a pressing need for responsive and agile ICT HR development.

This pressing need provides a business opportunity to establish a national ICT bridging program/academy, that would provide needed professional training in defined sector subject (technical) and functional (managerial) areas. Such a program/academy must develop a constructive and proactive working relationship with industry to help develop needed competencies in specified verticals and/or technical directions. It would facilitate and provide international certification in specific subject and technical areas. Agile and responsive HR development is needed to propel and sustain the ICT industry in a specific direction.

MoICT and the Royal Scientific Society have recently launched a bridging program. The private sector in cooperation with IFC is working to develop a private sector driven bridging institute. The IFC is supporting the establishment of this institute. It is foreseen, that the MoICT led program and the private sector institute will eventually converge (merge) to serve national needs.

It is deemed necessary that the ICT sector undertake the development of a bi-annual labor force study which identifies that various telecommunications and IT labor needs at a local and regional level. Such a study would help focus program and academy efforts to ensure that ICT professionals are provided with necessary skills relevant to market needs. INT@J could be tasked with this responsibility.

Small/Poor local market:
The Jordanian market is small and relatively poor. Many regional countries have larger populations and larger economies. The Jordanian economy is almost entirely comprised of MSMEs. MSMEs represent almost 99.6% of all registered firms (outside the agricultural sector[38]). Most MSMEs are owned and managed by the same individual. Most of these enterprises, at the start up stage, were composed of only the owner. Currently, 76% of them have at least two employees[39].

The small size of Jordanian companies (across most sectors and economic activities) means that these companies are unlikely to be able to afford investing in original (un-pirated) ICT systems and solutions. The companies are too small to have developed administrative and managerial systems and are therefore too small to benefit from implementation of ICT systems. Thus, MSMEs need to have access to technical knowledge in the form of management and business consulting to develop and implement systems within the MSMEs before embarking on an efficiency improving ICT system.

Accordingly the ICT sector needs to integrate with the Jordanian management consulting sector to help develop relevant solutions for MSMEs within select Jordanian sectors. These solutions will not only provide growth opportunities for the local ICT industry but will also help improve the efficiency and competitiveness of the MSMEs across most sectors.

Moreover, due to the small, fragmented and generally poor Jordanian private sector, any significant growth in the ICT sector is predestined to be export led. The ICT sector can use Jordanian sector experience to develop products and services to address needs in specific high value added industries for the ultimate purpose of export. These new products and services can serve regional markets and could be twinned with international vendors. Jordan should be promoted as a cost effective location for new product and service development to international ICT companies.

[38] Jordan Human Development Report 2011, page 65:
http://planipolis.iiep.unesco.org/upload/Jordan/Jordan_NHDR_2011.pdf
[39] Jordan Human Development Report 2011, page 66:
http://planipolis.iiep.unesco.org/upload/Jordan/Jordan_NHDR_2011.pdf

Annex 4

Where to Focus and Why

Jordan has limited natural resources and limited market size. Most Jordanian companies are MSMEs. Limited local consumption does not provide adequate opportunity for growth. Because of limited market size most Jordanian ICT companies develop products whenever the private sector/client intermittently articulates a business need. As such, local companies jump from opportunity to opportunity to maintain necessary short term cash flow.

Focusing on securing sales derived from intermittent business opportunities prevents developing deep knowledge in any single sector. Lack of deep knowledge and understanding prevents Jordanian ICT companies from developing cumulative sector specific knowledge and skills and thus developing internationally competitive technical skills. It is imperative to focus national efforts on areas that yield productive and sustainable benefits for target economic sectors in general and the ICT sector in specific over the long term.

Developing International Partnerships:
To overcome the shortfalls of a limited and intermittent local IT market, local IT companies should consider developing international partnerships with international tier 1 (Tier one companies are direct suppliers to OEMs) and tier 2 (Tier two companies are the key suppliers to tier one suppliers, without supplying a product directly to OEM) companies. This has already been successfully done on a limited scale with companies like CISCO. The development of multiple partnerships will facilitate global reach by local companies through the international partnerships.

Infrastructure:
Modern telecommunications infrastructure is essential to the sustainable and competitive growth of Jordan's national ICT industry. Relevant competitive (cutting edge) infrastructure is needed to introduce new technologies and opportunities to the ICT community. New technologies and new opportunities facilitate innovation and sector growth/evolution in the sector. For Jordan's ICT sector to be sustainable competitive and to be a sustainable export led economic engine requires that infrastructure be developed and maintained to remain relevant to the sector.

Evolving telecommunications infrastructure provides an opportunity to develop technical skills (maintenance and management) in Jordan to serve international system/manufacturers and regional/international operators. For example, Zain, the first GSM operator license holder, used their Jordanian engineers and technicians in rolling out Zain networks in Iraq, Syria, Egypt and Africa, etc. The cumulative technical experience of Jordanian companies can be used to assist regional and international telecommunication operators working regionally (GCC) and globally (CIS States, Africa, etc.).

Export Development:
Export development is essential to developing sustainable economic growth and job creation. The Jordanian economy is too small and poor at present to fuel substantial economic growth. Exports to larger and/or wealthier countries are required to develop and sustain job creation, as well as sustainably improve company revenues and profitability. Jordanian ICT companies will only be able to export successfully if they are able to develop competitive products and services which have high utility for their intended target markets. High utility (added value) will allow Jordanian companies to charge higher prices with higher profit margins. It is for this reason that ICT companies are recommended to develop working relationships with Jordan's most competitive knowledge sectors such that they can identify specific needs which can be addressed through ICT product/service development and incorporate the knowledge and experience of the targeted sector. Moreover, the ICT sector can also focus efforts on the development of Arabic language based digital content targeting regional export markets.

Role of the Government (MoICT and TRC):
MoICT and TRC need to evolve to become more effective and involved as facilitators of economic development. Despite the Government of Jordan's recent fiscal and budgetary limitations, the GoJ needs to develop and implement creative ways to facilitate private investment in infrastructure development as well as the E-services such as E-health, E-government and E-education. The GoJ can implement concepts such as Build Operate Own (BOO), Build Operate Own Share Transfer (BOOST), Build Operate Transfer in addition to standard licensing. This will require the passing of the Public Private Partnership (PPP) law by Jordanian parliament.

Since the GoJ and the private sector face financial limitations and constraints, GoJ should consider promoting localized infrastructure development to develop hubs of ICT competence through the establishment of local techno poles or technology corridors. The techno poles and corridors can be used as national technical development tools to create broad national ICT capacity and capability in specific sub-sectors (BPO, on-line digital content, mobile content, application development, etc.) in specified geographic areas such as what is currently being done with BPO in Irbid. An Amman based Techno pole could focus on E-education or online content for example.

The creation of techno poles (localized infrastructure development) near an industrial estate would facilitate the intersection/diffusion of ICT with industry (manufacturing). ICT entrepreneurship within the techno poles or ICT corridor could be further enhanced if the techno poles/corridors benefited from the same regulatory environment as Jordan's existing development zones regime. Such an intersection would help develop deep vertical knowledge within some ICT companies making them more innovative and internationally competitive.

The GoJ through legislation and regulation has a tool to help direct ICT development in specific economic directions. For example, MoICT and the Ministry of Public Works and Housing (MoPW&H) and Greater Amman Municipality (GAM) could adopt after investigation existing, relevant international standards for smart buildings. Moreover, GoJ can investigate requiring that network conduits be included in all new road/highway construction projects undertaken by the MoPW&H as well as investigate requiring the incorporation of new cable arrays in the

upgrading/expansion of new electrical grids. This would improve the competitiveness of the construction sector and facilitate the intersection and diffusion of ICT into architecture and construction.

Since clean technology is a nationally supported innovation cluster (supported by the Ministry of Planning and International Cooperation's (MoPIC's) National Competitiveness and Innovation Council), government legislation governing public and/or private buildings can facilitate the type of intersection (diffusion) between ICT, the Clean Technology sector, Architecture and Engineering sector, Healthcare sector, Financial Services sector, and Education sector to reduce the carbon footprint of buildings, reduce water consumption and improve roof top based water harvesting.

GoJ support through investment incentives (i.e. tax credits, certification investment tax credits, etc.) and/or Research and Development subsidies would promote the development of high value added ICT products and services which would increase the efficiency and competitiveness of some manufacturing sectors and companies. There currently exist a variety of GoJ managed funds (R&D Fund at the Ministry of Higher Education and the universal service fund (not yet functional)) which could be focused towards enhancing the intersections and diffusion between ICT and different economic sectors to increase economic growth, competitiveness and job creation. According to the R&D Fund bylaw the fund can be used to:

1. Fund scientific research and development proposed by Jordanian universities, public institutions and relevant private sector companies.
2. Fund overcoming challenges faced by Jordanian companies in developing or improving products and services which will increase their overall competitiveness in cooperation with Jordanian universities.
3. Provide financial support the utilization of science in scientific research to develop technology and promoting the results of such research.
4. Provide financial support to develop research and development capability in relation to intellectual property protection and patent registration.

It is anticipated that these funds, while considering their original purpose and objectives, could also be used to direct telecommunications service development in mobile enabled services to serve E-government, E-commerce, etc. This will create development opportunities for existing companies in ICT (for development and export) as well as empower or create new and/or different business sectors in the economy.

Great economic potential is hidden in existing national infrastructure. The GoJ sold the national land line network (copper lines) with the privatization of the Telecommunications Corporation (TCC) to a consortium led by France Telecom and Arab Bank on January 23, 2000[40]. Although Jordan Telecommunications Group (JTG's) exclusive rights of supply of fixed services ended on December 31st, 2004 and the telecommunications sector became fully liberalized, the Jordan Telecommunications Group (JTG) remains in effective control of the copper land line network.

[40] http://www.itu.int/ITU-D/arb/WTDC-02/Documents/10-e.pdf

The use of the copper lines needs to be fully unbundled allowing other operators to use what once was a state asset. This may require changing the regulations which govern public use of a national asset. Unbundling the copper will allow more ICT service to be developed and delivered to citizens creating economic opportunity for existing and new ICT companies.

The GoJ also invested in establishing a national broadband network (NBN) as a private network for the government use. This national initiative was to bridge the digital divide among Jordanian citizens and enable the provision of ICT services (E-Government, E-Health, E-Education, etc.) to all segments of society. This enlightened investment was also to act as a tool to enhance the development and competitiveness of local ICT companies in such areas as e-education.

Regretfully, the NBN investment proved too large for the GoJ to financially complete and exploit. For the local economy to benefit from the sunk costs of the GoJ investment will require that the existing NBN be completed and activated through creating bold opportunities for the private sector (local and/or international) to invest in, develop and deliver services to consumers (E-Education and E-Health, cable television, etc.) or by creating national large scale demand/usage for E-services (E-Commerce and E-Government). To start exploiting NBN will require identifying national E-Government, E-Service priorities by the government (Ministry of Public Sector Reform in cooperation with MoICT and relevant government entities), passing the PPP law (or at least agreeing on or adopting acceptable partnership models), arriving at acceptable revenue sharing models with the private sector and passing the amendments to the E-transactions law and a national privacy act.

It is important to assess the private sector exploitation of NBN.. Partial or complete handover to the private sector of the NBN may greatly reduce or eliminate GoJ operational costs to run the NBN. This will free up public sector funds which can be directed towards developing new needed national infrastructure.

Local demand for NBN services and applications can be enhanced through GoJ funding (complete funding or partial funding or through PPPs) for the construction of open access fiber optic networks. Moreover, MoICT in cooperation with the MoPW&H, based on investigation results, may require that network conduits be included in all new road projects.

ICT Diffusion

Economies and societies have become dependent on the use of Information and Communications Technologies (ICTs). Innovation, productivity and energy-saving, just to mention a few are key drivers of economic growth. Social networking, E-government and E-health are examples of the social use of ICT. The ability to provide products and services to a nation requires the existence of efficient ICT infrastructure and a competitive business environment which facilitates the provision of competitive and innovative ICT goods and services.

Factors affecting ICT diffusion at the firm, industry and country level through different diffusion channels raises different issues for policy makers in terms of education, industry, competition policies and more generally the regulatory framework.

- *Diffusion and ICT Infrastructure*

The pace of broadband growth has been exceptional over the past years. New developments resulting from the convergence of broadcasting and the Internet, the emergence of cloud computing and the eventual shift to "smart" infrastructure is likely to place further pressure on existing resources. Stimulating private investment to ensure that sufficient capacity is made available and affordable will be a fundamental step and will have several policy and regulatory implications.

With the increasing use of fiber and the desire to expand the availability of improved broadband, network reach and capabilities, policy makers and regulators are seeking to stimulate increased investment, innovation and consumer choice. Following the liberalization of communication markets, competition has been a critical tool in meeting these objectives. The challenge now is how to ensure the benefits that flow from competition, will be retained and enhanced in the new environment

ICT diffusion not only depends on the cost of the network investment, but also on the associated costs of communication and use. Increased competition in the telecommunications industry, owing to extensive regulatory reform, has been of particular importance in driving down these costs. Liberalization, and the competition it has generated, has brought many benefits to users. Prices have declined, and continue to do so in certain market segments, such as broadband

- *ICT Diffusion and Education*

Several factors influence the adoption of a new technology by firms. In particular a firm's absorptive capacity depends on the level of cumulative and related knowledge. Education policies play a key role because education shapes the workforce with appropriate skills, enabling them to make use of new technologies.

A good supply of qualified personnel is important, but traditional education needs to be supplemented with actions to foster lifelong learning. National policies aimed at enhancing basic literacy in ICT, at building high-level ICT skills, at lifelong learning in ICT, and at enhancing the managerial and networking skills needed for the effective use of ICT, are particularly relevant.

- *ICT Diffusion and the Public Sector*

In Jordan, the public sector has been seen as either the ultimate financer of scientific research or as the end-user of technology without any active role in the development of technology. Effective governments increasingly act as catalysts and coordinate technical resources for the benefit of end users through public technology procurement; thus affecting the direction and speed of technical change.

The Public sector is more and more involved in the design, early experimentation and development of ICT applications for the benefit of a wide category of end-users, including firms, families and individual citizens. Improvements in the telecommunications sector are, for instance, a good example of the changing role of public procurement. A key role can be played by public administrations (ministries and departments) which are in a position to test new communication technologies and to develop advanced e-Government services interacting with both ICT suppliers/developers and end-users of advanced technological solutions. As an example, the integration of ICT in the customs clearing process has improved the competitiveness of several nations by facilitating a faster and less problematic customs clearance

process. The GoJ might consider engaging the private sector to develop required products at cost[41]. Additionally, the private sector might also consider cooperating with the public sector allowing them to cover part of the development to reduce product development risks, for the purpose of enabling them to develop and install products which have promising export potential. Such cooperation would enable the private sector to develop, deploy and demonstrate solutions which would have export potential in other countries and/or other application for other uses.

Businesses, governments, consumers and key infrastructure all rely on the use of information networks which are often interconnected at a global level. This raises issues of security as these networks need to be stable and ready for safe, secure and reliable use under all conditions.

Efficient and enforceable consumer protection is a basic condition to enhance consumer trust and require close collaboration between governments, business and civil society. But for any trust related tool or measure to be effective, users must be E-aware, and understand the protections afforded

Governments can make the use of ICT more trust worthy by using ICT applications themselves. Tendering public services, providing digital public services, collecting taxes or procuring goods and services online can help increase government efficiency and enhance access to public services, while having the additional benefit of public confidence and strengthening demand.

- *ICT Diffusion and the Business environment*

The most important factor affecting continued ICT diffusion is the business environment. Governments need to reduce unnecessary costs and regulatory burdens on firms by creating a proactive business environment that continually promotes productive investment. This involves policies that enable firms to undertake organizational changes, that strengthen education and training systems that encourage good management practices, and that foster innovation (i.e. new applications).

Moreover, policy should foster market conditions that reward the successful adoption of ICT; competition is the key in selecting firms that are able to leverage the benefits of ICT and in making them flourish and grow. Policies to foster growth in services are important as well. ICT offers a new potential for growth in the service sector, regulations that stifle change/innovation should be modified or removed.

Moreover, competition needs to be strengthened. Competition not only helps lower the cost of ICT products and services, which fosters diffusion but also pressures firms to improve performance and change conservative attitudes.

- *Strategic Objective of ICT Diffusion*

Enhancing ICT diffusion in Jordan will enable economic growth through high value added product and service development, which leverages the energy and creativity of youth and Jordan's educated population and the academic capability and capacity of Jordan's universities and research centers. ICT will enable greater competitiveness in other specialized economic sectors which will help develop sustainable high value added job growth.

[41] Result of consultation with the private sector on February 7th, 2013 at MoICT

- *Pillars ICT diffusion*

There are four main pillars which foster ICT diffusion. They are:

- ICT network Infrastructure
- Education
- Innovation
- Business Environment

Application Development:

The national ICT sector needs to focus on areas where Jordan already has competitive advantage. There is an opportunity to develop sustainable national competitive advantage if the ICT sector intersects with numerous domestic economic sectors.

Intersections and resulting sector diffusion will build symbiotic relationships with various sectors. This will allow for building and maintaining cumulative ICT linkages with these sectors. The ICT sector will improve its competitiveness by being able to integrate intimate technical knowledge into their ICT products and services. Participating sectors will also improve their competitiveness by having access to improved and more efficient ICT solutions. These intersections should be facilitated between the ICT sector and various competitive domestic verticals such as:

- Medical/Healthcare
- Architecture and engineering,
- Pharmaceuticals,
- Clean Technology
- Agriculture
- Tourism
- Education
- Banking and Finance (Islamic banking and finance is an interesting opportunity)

Developing intersections will help ICT diffuse into these sectors securing and improving sector competitiveness. These intersections can leverage existing comparative advantages into longer term competitive advantages for the entire economy. This is particularly true with marginally competitive sectors such as manufacturing in Jordan.

Once ICT companies intersect with different economic sectors, the ICT companies should focus on creating individual products (productization) instead of one-off custom software products. Productization requires investment and a long term outlook by the ICT Company. Investment will help secure the company's cumulative knowledge in a specific vertical and will effectively demonstrate the company's identity and capability. Productization will and allow for economies of scale to be established. New projects based on an existing foundation product will enable faster implementation and continuous quality improvement. Developing national products will also help will help define a national ICT brand identity.

Business Process/Knowledge Process Outsourcing (BPO/KPO):

Outsourcing has become an international business paradigm. International companies seek ways and means to reduce costs in their businesses. Recently Jordan has entered into the BPO/KPO

realm with several newly established companies serving regional airlines, international service companies and international IT companies (CISCO and HP).

BPO/KPO represents an excellent opportunity for Jordan to integrate into international value chains. The fact that CISCO has one of their largest international technical assistance center in Jordan with one of the highest service delivery ratings for CISCO, indicates the level and quality of available human resources. Several Jordanian investors have established call centers to address regional needs and as such have attracted several regional airlines (Fly Dubai, Saudi (Saudi Arabian Airlines) and Emirates). BPPO/KPO demonstrates on the ability of non-traditional ICT applications to create sustainable jobs and exports by serving international business needs.

Jordan should start with BPO (call centers, etc.) but needs to move up the value chain into KPO. Jordan does not possess the large workforce size as other countries (Egypt, India, etc.) which allow them to dominate the lower value added BPO/call center market. KPO leverages Jordan's national investment in university education, allowing companies to develop and sustain competitiveness based on exploiting Jordan's educated workforce. KPO will allow Jordan to maximize export service revenues as they provide higher value added services. KPO can be developed in small specialized verticals where Jordan can exploit and further develop its university educated workforce.

Jordan can play a regional role with regards to call centers and BPO. This is largely due to the fact that Jordanian Arabic is accenting neutral (i.e. closest to classical Arabic). As such, the Jordanian accent is understood throughout the Arab world. The accent is a nuanced competitive advantage as it will allow higher cost Arab countries such as those in the GCC to benefit from Jordan as a call center or BPO service delivery location. This benefit has already been demonstrated in the Airline industry.

The presence of CISCO's and HP's technical assistance centers in Jordan is a testament to Jordan's KPO potential. This potential needs to be further developed and exploited by identifying likely verticals, developing and preparing the required labor force and promoting this capability regionally and internationally. Jordan can successfully enter the IT outsourcing domain through KPO. Jordan currently has one of the largest percentages of CISCO and Microsoft certified engineers, programmers and network specialists in the world (on a per capita basis). Talented individuals are the core resource for successful IT outsourcing. How Jordanian IT graduates are exploited is the domain of international IT companies and progressive IT investors.

For BPO/KPO sectors to be successful, it is imperative that the BPO/KPO sector secures reliable, redundant and cost effective telecommunication infrastructure to develop this promising sector. Once competitive telecommunication infrastructure is secured and Jordan is able to provide competent and trained labor, FDI will be attracted. Currently, several Indian outsourcing companies are seeking to develop businesses in Jordan to serve the GCC market, because India does not have Arabic language capability. It is anticipated that the proposed export house will internationally market investment opportunities in the BPO/KPO domain.

<u>Digital Content:</u>

Digital content is one of the exciting and broad areas for development in Jordan. Approximately 3% of all the content on the internet is in Arabic while the Arab world constitutes about 5% of the global population[42]. The Arab world is one of the most youthful global populations and one of the most likely populations to adopt new ICT technologies and services.

Mobile phone and smart device penetration in the Arab world has surpassed levels found in many advanced western economies. Internet penetration is increasing but remains below western standards. Internet penetration will likely improve as mobile devices become a more dominant means of accessing the internet. Mobile devices have led to increased consumption of digital content in the form of mobile applications and mobile games. Many Jordanian developed games have found markets outside of the Arab world. The Jordanian developed mobile card game "Tricks" and "trump" have found markets in China and Russia. A Jordanian developed mobile educational application, won the World Summit Award for mobile applications. Thus mobile games and applications have regional and international market opportunity.

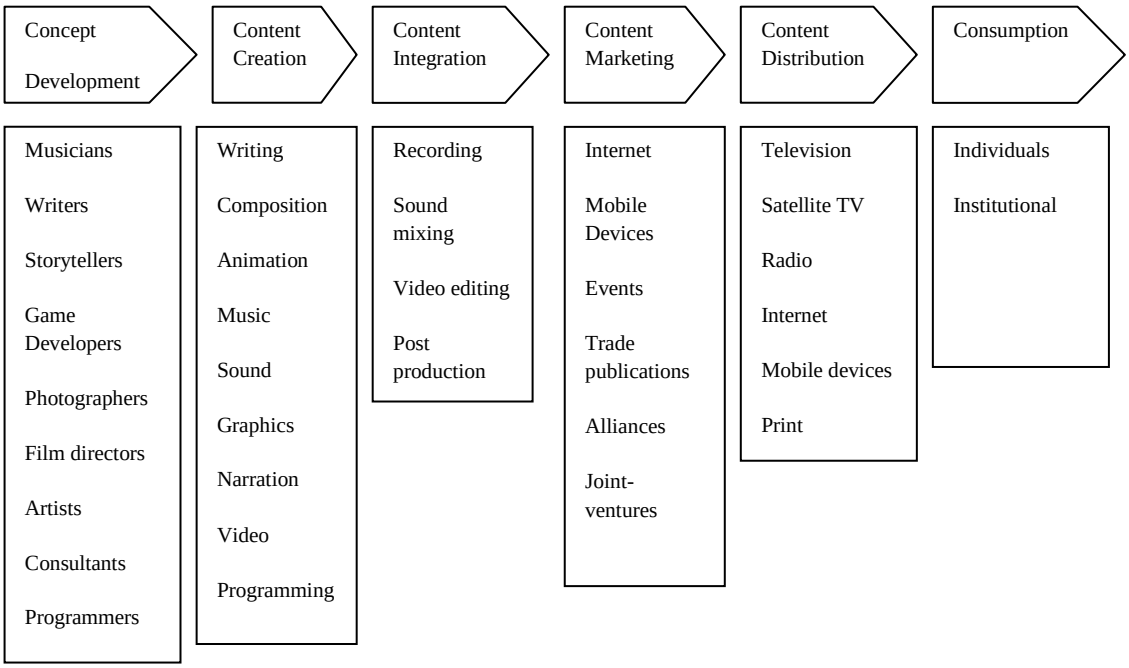
The attractive feature of digital content is that it is a means for self-expression in all its aspects. Digital content can integrate story-telling, art, music, acting, programming, graphics, interactivity, narration, news, game design, virtual architecture, etc. to create complex, creative, high value added output. Therefore a competitive digital content sector can create sustainable economic opportunity for many individuals across many complementary sectors.

Digital content can be delivered through traditional means such as television, cable television as well as through mobile devices and internet. Because of the common language, religion and culture, digital content has great regional export potential. Digital content development has the ability and opportunity to harvest the creativity of Jordan's youth and leverage it to develop regional exports in the short term and possibly global exports in the medium to long term.

Developing and distributing digital media can be seen to go through a six stage value creation process with the various stage defined inputs[43]:

[42] http://www.internetworldstats.com/stats7.htm

[43] Source: Arabian Business Consultants for Development, ICT Digital Content Report for Chemonics, 2006



Digital content is powerful because it can integrate the creative talents from many individuals across disparate sectors to create meaningful and desirable products/services which have a market of over 350 million Arabs in this region and more than422 Million Worldwide. This market exists not only because of a single common language but also because there is a shared, common culture and religion. Digital content is familiar and accessible (absorbable) to most Jordanians and Arabs, while pure programming is not. Digital content is an excellent platform for demonstrating the utility of ICT to a young Arab population seeking self-expression. Of increasing recent importance has been the growth of digital gaming in Jordan.

Annex 5

Financial Summary for the National ICT Strategy

The table below is to provide guidance to readers of the annual financial requirements to execute all initiatives and actions defined in the National ICT Strategy. All the activities described in the National ICT Strategy are activities of national importance. As such, the responsibility of most investments falls on the private sector, particularly those related to infrastructure, education and product and service development. The strategy also tries to make as much use of existing national infrastructure such as universities and training centres. It is the role of government to provide and maintain a business environment which is conducive to repeated private sector investment. Thus, the ability of the strategy to be implemented will be predicated on the ability of both the public and private sector to work responsibly towards its implementation.

Many of the actions require substantial financial commitment such as telecommunication infrastructure investment. With Jordan's open telecommunication sector, such investment opportunities can only be identified as an opportunity not imposed on operators or investors. Therefore, whether such investments are actually made depends on whether investors/operators perceive the benefit of the investment. Since the GoJ is no longer active in or financially capable of making infrastructure investments, the ability of both the telecommunications and IT sector to benefit from new telecommunication investments depends on the how investors/operators view the commercial viability of the investment. For this reason, it will be required that the TRC develop and communicate attractive licensing opportunities for the telecommunications sector for the Jordanian IT sector to continue to grow and be competitive.

Initiatives	Actions	2013	2014	2015	2016	2017
1.1 Legislative and Regulatory Framework Enhancement	1.1.1 Revision of the telecommunications law.	**0**				
	1.1.2 Revision of and passing the proposed amendments to the E-Transactions law and related regulations.	**0**				
	1.1.3 Drafting and passing new E-Payment regulations based on the approved amendments of the e-transaction law.	**0**				
	1.1.4 Introducing a new Privacy Act.	**0**				
	1.1.5 Passing of the PPP law (or officially recognizing partnership modalities which are attractive to the private sector) to facilitate private sector involvement in national ICT infrastructure investment.	**0**				
	1.1.6 Propose and draft a Venture Capital Legislation	**0**	**150**			
	1.1.7 Enable the TRC to have the necessary technical and business expertise and capacity and to maintain a highly skilled team of sufficient size to fulfill its responsibilities in terms of creating a suitable regulatory environment and be able to effectively implement and enforce its decisions in a timely manner	**0**	**0**	**0**	**0**	**0**
1.2 Reviews of relevant telecommunications markets and sub-markets	1.2.1 Conduct reviews of relevant telecommunications markets and sub-markets that reflect recent data and market conditions			**500**		
	1.2.2 Adjust regulations to facilitate competition among communication providers through value added services.	**0**	**0**	**0**	**0**	
1.3 Universal Service Policy Revision	1.3.1 Revise the Universal Service Policy.		**0**	**250**		
	1.3.2 Implement the outcomes/requirements stipulated in the revised universal policy			**0**	**0**	

Initiatives	Actions	2013	2014	2015	2016	2017
1.4 Implement innovative spectrum management to exploit the largest economic and societal benefit from this limited public resource.	1.4.1 TRC to investigate and adopt, if possible, advanced spectrum management principles		**0**	**0**	**0**	**0**
	1.4.2 Identify the revenue generation possibilities derived from releasing additional spectrum to the market. Prioritize these opportunities for development.		**0**			
	1.4.3 Identify what additional spectrum can be freed up by switching to digital transmission. What is the size of the "digital dividend"			**0**		
	1.4.4 Identify when and how much could extra spectrum be freed up (after implementing what series of opportunities).			**0**		
.	1.4.5 Free up unused spectrum and place under the review of the TRC for targeted exploitation of specific opportunities.			**0**	**0**	
	1.4.6 Come to an agreement with the military on how to make use of freed spectrum in specific defined cases.					**0**
1.5 Revision of Tax Burdens	1.5.1 Explore the use of tax relief and other incentives in order to encourage increased penetration of PCs and other Internet-capable devices		**0**			
	1.5.2 revise and amend, if possible, the rules for offering online services' in the Jordanian market and elsewhere		**0**			
	1.5.3 Regularly review and, if necessary, adjust the tax burdens imposed on the IT sector and IT-enabled services.		**0**	**0**	**0**	**0**

Initiatives	Actions	2013	2014	2015	2016	2017
	1.5.4 Government to publish clearly how taxation, licensing and fee regimes are applied on ICT companies, products, and services	**0**	**0**	**0**	**0**	**0**
1.6 Adoption of ICT security standards at the national level and volunteer qualification of individual companies	1.6.1 Review international ICT security standards for e-transactions.		**0**			
	1.6.2 Communicate the necessity and benefits of achieving specific ICT security standards within institutions through workshops and seminars.			**50**		
	1.6.3 Develop and advise relevant entities to start implementation of an ICT security standard plan based on the defined priorities.			**0**		
	1.6.4 Identify and hold appropriate (ICT Security related) training for individuals working in commerce, finance, government and education.				**50**	**50**
2.1 Identify existing Jordanian ICT companies seeking local and foreign investment, identify investment opportunities in targeted ICT verticals su and promote the investment opportunities	2.1.1 Request from INT@J investment summaries from companies seeking investment (including ICT enabled BPO and digital content companies)	**0**	**0**	**0**	**0**	**0**
	2.1.2 Conduct investment assessments making sure that the companies are liquid and well managed and that there is a well-defined value proposition for interested investors.	**50**	**50**	**50**	**50**	**50**

Initiatives	Actions	2013	2014	2015	2016	2017
	2.1.3 Classify and document the investment summaries according to their objective and publish on the INT@J website and the JIB website.	**0**				
	2.1.4 Train JIB staff on presenting the individual opportunities	**0**				
	2.1.5 Utilize JIB's reach and contact lists to identify individual interested investors & communicate these investors to the individual companies. Train company staff on how to close an investment deal.		**50**	**50**	**50**	**50**
	2.1.6 Attend and/or hold a national ICT investment forum in which Jordanian ICT investment opportunities are highlighted and marketed.		**100**	**100**	**100**	**100**
2.2 Identify and market investment opportunities for infrastructure development and or new public service provision	2.2.1 MoICT in cooperation with INT@J and existing operators should define and prioritize several infrastructure projects for marketing and promotion.		**0**			
	2.2.2 Classify these projects according to their objectives and publish these opportunities on the INT@J website and the JIB website. Develop documentation of these opportunities.		**0**			
	2.2.3 Train JIB, INT@J and MoICT staff on presenting the individual opportunities		**0**			
	2.2.4 Utilize JIB, INT@J and existing local operators reach and contact lists to identify individual interested investors. Direct these investors to the TRC.		**50**	**50**	**50**	**50**

Initiatives	Actions	2013	2014	2015	2016	2017
2.3 Creating Techno-poles	2.3.1 Creation of geographically specific techno-poles and technology corridors to attract private sector investment in a limited geographic area.	**50**	**100**			
2.4 Promote Intellectual Property Development and Registration	2.4.1 Develop and deliver capacity building programs for researchers, academics and private sector on IP, the benefits of IP registration and technology commercialization.	**25**	**50**	**50**	**50**	**50**
	2.4.2 Provide support to companies and the legal community on the IP registration process (registration, legal services, etc.)	**50**	**100**	**100**	**100**	**100**
	2.4.3 Facilitate collaboration through incentives that encourage universities to develop IP in partnership with the private sector targeting their needs	**25**	**50**	**50**	**50**	**50**
	2.4.4 INT@J to lead a national program to identify IP which already exists in existing Jordanian ICT products and services.	**50**	**100**	**100**	**100**	**100**
2.5 Support ICT Innovation Centers	2.5.1 Develop a program to support the development of business/innovation centers or incubators as well as Technology Transfer offices		**25**	**50**	**50**	**50**
3.1 Facilitate intersections between ICT and other high value added sectors	3.1.1 Hold one meeting every quarter between interested INT@J members and members of relevant associations:	**5**	**10**	**10**	**10**	**10**
	3.1.2 Identify opportunities for the public and private sectors to develop proof of concept products and services at cost or for free in which the private sector will be able to use these products to develop exports to similar institutions or use the technology[2].	**50**	**50**	**50**	**50**	**50**

Initiatives	Actions	2013	2014	2015	2016	2017
3.2 Identification of technical barriers hindering export of Jordanian ICT products and services.	3.2.1 Identify international and WTO export requirements which are hindering or affecting exports of Jordanian ICT products and services.		25			
3.3 Export facilitation to target markets	3.3.1 ICT Export barometer development	50	175	100	100	100
	3.3.2 Establish export technical assistance and capacity building for ICT companies:		125	500	500	500
	3.3.3 Develop and implement an ICT companies rating model to promote maturity of companies and enhance exports opportunities.		50	100	25	25
	3.3.4 Publishing Export Market Reports		75	100	100	100
	3.3.5 Collaboration with Jordanian expats for Export	25	50	50	50	50
	3.3.6 Develop Regional and Global Links for Export	90	180	180	180	180
	3.3.7 Building National Consortia in Various Fields to consolidate the export capabilities of the ICT sector and sector companies.	50	100	100	100	100
	3.3.8 Finalize establishing a National Software Quality Accreditation and certification center.	0				
3.4 National export house to develop markets for Jordanian ICT companies.	3.4.1 Establish a national ICT export house funded by the private sector and managed as a profit making entity, focusing on the markets identified by Export Market Reports	50	200	200	200	200
4.1 Update ICT infrastructure to be an enabler for continuous innovation in technology trends:	4.1.1 If deemed commercially feasible by the operators/investors; Installation of national Internet Exchange Point (IXP) through which ISPs exchange Internet traffic between their networks.		1,000	1,000		

Initiatives	Actions	2013	2014	2015	2016	2017
	4.1.2 If deemed commercially feasible by operators/investors; upgrading the existing public telecommunications network to an advanced NGN network		10,000	20,000	20,000	20,000
	4.1.3 Organization of 4G frequency auction.	0				
	4.1.4 If deemed commercially feasible by operators/investors; Upgrading existing mobile networks to LTE based network	6,250	25,000	25,000	25,000	18,750
	4.1.5 If deemed commercially feasible by operators/investors; Establish a regional cloud computing center		3,750	15,000	3,750	
4.2 Private sector exploitation/use of NBN	4.2.1 Facilitating partial or complete private sector exploitation/use of NBN.		100			
4.3 Unbundled and shared access to local loops and sub loops	4.3.1 Ensuring the provision of physical network infrastructure access services such as Local Loop Unbundling and all forms of unbundled and shared access to local loops and sub loops at each feasible location including access to associated facilities and services on a nondiscriminatory basis		0			
4.4 Infrastructure and facilities sharing	4.4.1 Enforcing infrastructure and facilities sharing between operators, and encouraging sharing of facilities with public utilities (such as electricity providers), at reasonable prices and conditions, in order to reduce the costs of providing and extending Internet service.	0	0	0	0	0
4.5 Implementing Number Portability	4.5.1 Implementing number portability, if deemed feasible, to facilitate customer choice among telecom service providers.		2,000			

Initiatives	Actions	2013	2014	2015	2016	2017
5.1 Work with all existing training and educational institutions to provide agile, sector responsive technical and managerial training to address the needs of the local ICT industry.	5.1.1 Identify, validate and document training and technology needs from ICT sector players through sector focus group sessions and questionnaires.		**20**	**20**	**20**	**20**
	5.1.2 Identify local, regional and international institutions/individuals that can supply the required training and provide certification if necessary.	**0**	**0**	**0**	**0**	**0**
	5.1.3 Contact existing educational institutions (PSUT, JUST, U of J, Al-Quds College, EJABI, RSS, etc.) to determine willingness to host or provide professional training and certification on behalf of the sector.	**15**	**25**	**25**	**25**	**25**
	5.1.4 The private sector to define a professional IT skill qualification framework and a model CV for workers in the ICT sector.	**100**		**100**		**100**
5.2 Establish and operate a training and certification (Bridging) center/program to meet local and regional ICT technical and managerial needs	5.2.1 Establishment of a professional training and certification (Bridging) center/program . (Existing Bridging programs are to integrate under this center)		**500**	**500**		
5.3 Maintain knowledge of what the ICT sector requires in terms of skills locally and regionally.	5.3.1 Conduct at least one study every year to identify the skills needed to meet the needs of the local and regional ICT sector taking into consideration expected industry trends and shifts in these trends.		**100**	**100**	**100**	**100**

Initiatives	Actions	2013	2014	2015	2016	2017
6.1 Increase awareness among potential users of where and how digital content can be developed.	6.1.1 Hold seminars at universities and high schools where local content developers can speak about their craft, the required skill sets and available opportunities. These seminars and workshops can be communicated as CSR opportunities for local content developers.					
	6.1.2 Develop a national award for content development which evaluates the creativity and innovation in the content as well as the creativity and innovation in the usage of the content.		**50**	**50**	**50**	**50**
	6.1.3 Integrate ICT use into university curriculum in areas such as journalism (facebook use, twitter use, etc.), drama and the arts which are becoming ICT and digital content heavy.		**100**	**100**		
	6.1.3.1 Alternatively use the professional development training through the bridging institute/program to deliver these courses.					
6.2 Improve the regulatory regime to Accelerate convergence between ICT and innovative audio visual and to proactively facilitate content	6.2.1 Identify and prioritize legislative and regulatory gaps between what currently exists in the Jordanian business environment with international best practice to accelerate convergence and content development growth.	**25**	**25**			
	6.2.2 Review the appropriateness of the existing publications and audio visual laws to make sure that they are aligned with best practices and do not hinder convergence and content development and identify areas of weakness in these two laws		**25**			

Initiatives	Actions	2013	2014	2015	2016	2017
	6.2.3 Propose amendments to existing laws which affect convergence and govern the content industry to bring them in line with international best practices and to make them as proactive tools for content development (this is to include proposed amendments to the publications and audio visual laws).		**50**	**25**		
6.3 launch a content industry development program	6.3.1 Conceptualize, fund and launch a content industry development program to accelerate digital content development within the local industry.		**100**	**100**		
6.4 Provide incentives for GoJ entities to develop an inventory of useful digital content.	6.4.1 Provide incentives (E-government award) to GoJ entities to develop, launch and use E-services.		**50**	**50**	**50**	**50**
Total (Excluding items highlighted in RED which are to be implemented by investors if commercially feasible)		**2,723**	**5,024**	**5,875**	**4,226**	**4,327**

Annex 6

Implementation Plan

Initiatives	Actions	2013				2014				2015				2016				2017			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1.1 Legislative and Regulatory Framework Enhancement	1.1.1 Revision of the telecommunications law.																				
	1.1.2 Revision of and passing the proposed amendments to the E-Transactions law and related regulations.																				
	1.1.3 Drafting and passing new E-Payment regulations based on the approved amendments of the e-transaction law.																				
	1.1.4 Introducing a new Privacy Act.																				
	1.1.5 Passing of the PPP law (or officially recognizing partnership modalities which are attractive to the private sector) to facilitate private sector involvement in national ICT infrastructure investment.																				
	1.1.6 Propose and draft a Venture Capital Legislation																				

		2013				2014				2015				2016				2017			
	1.1.7 Enable the TRC to have the necessary technical and business expertise and capacity and to maintain a highly skilled team of sufficient size to fulfill its responsibilities in terms of creating a suitable regulatory environment and be able to effectively implement and enforce its decisions in a timely manner																				
1.2 Reviews of relevant telecommunications markets and sub-markets	1.2.1 Conduct reviews of relevant telecommunications markets and sub-markets that reflect recent data and market conditions																				
	1.2.2 Adjust regulations to facilitate competition among communication providers through value added services.																				
1.3 Universal Service Policy Revision	1.3.1 Revise the Universal Service Policy.																				
	1.3.2 Implement the outcomes/requirements stipulated in the revised universal policy																				
1.4 Implement innovative spectrum management to exploit the largest economic and societal benefit from this limited public resource.	1.4.1 TRC to investigate and adopt, if possible, advanced spectrum management principles																				

		2013				2014				2015				2016				2017			
	1.4.2 Identify the revenue generation possibilities derived from releasing additional spectrum to the market. Prioritize these opportunities for development.																				
	1.4.3 Identify what additional spectrum can be freed up by switching to digital transmission. What is the size of the "digital dividend"																				
	1.4.4 Identify when and how much could extra spectrum be freed up (after implementing what series of opportunities).																				
.	1.4.5 Free up unused spectrum and place under the review of the TRC for targeted exploitation of specific opportunities.																				
	1.4.6 Come to an agreement with the military on how to make use of freed spectrum in specific defined cases.																				
1.5 Revision of Tax Burdens	1.5.1 Explore the use of tax relief and other incentives in order to encourage increased penetration of PCs and other Internet-capable devices																				
	1.5.2 revise and amend, if possible, the rules for offering online services' in the Jordanian market and elsewhere																				
	1.5.3 Regularly review and, if necessary, adjust the tax burdens imposed on the IT sector and IT-enabled services.																				

		2013				2014				2015				2016				2017			
	1.5.4 Government to publish clearly how taxation, licensing and fee regimes are applied on ICT companies, products, and services																				
1.6 Adoption of ICT security standards at the national level and volunteer qualification of individual companies	1.6.1 Review international ICT security standards for e-transactions.																				
	1.6.2 Communicate the necessity and benefits of achieving specific ICT security standards within institutions through workshops and seminars.																				
	1.6.3 Develop and advise relevant entities to start implementation of an ICT security standard plan based on the defined priorities.																				
	1.6.4 Identify and hold appropriate (ICT Security related) training for individuals working in commerce, finance, government and education.																				
2.1 Identify existing Jordanian ICT companies seeking local and foreign investment, identify investment opportunities in targeted ICT verticals su and	2.1.1 Request from INT@J investment summaries from companies seeking investment (including ICT enabled BPO and digital content companies)																				

		2013				2014				2015				2016				2017			
promote the investment opportunities																					
	2.1.2 Conduct investment assessments making sure that the companies are liquid and well managed and that there is a well-defined value proposition for interested investors.																				
	2.1.3 Classify and document the investment summaries according to their objective and publish on the INT@J website and the JIB website.																				
	2.1.4 Train JIB staff on presenting the individual opportunities																				
	2.1.5 Utilize JIB's reach and contact lists to identify individual interested investors & communicate these investors to the individual companies. Train company staff on how to close an investment deal.																				
	2.1.6 Attend and/or hold a national ICT investment forum in which Jordanian ICT investment opportunities are highlighted and marketed.																				

		2013				2014				2015				2016				2017			
2.2 Identify and market investment opportunities for infrastructure development and or new public service provision	2.2.1 MoICT in cooperation with INT@J and existing operators should define and prioritize several infrastructure projects for marketing and promotion.																				
	2.2.2 Classify these projects according to their objectiveand publish these opportunities on the INT@J website and the JIB website. Develop documentation of these opportunities.																				
	2.2.3 Train JIB, INT@J and MoICT staff on presenting the individual opportunities																				
	2.2.4 Utilize JIB, INT@J and existing local operators reach and contact lists to identify individual interested investors. Direct these investors to the TRC.																				
2.3 Creating Techno-poles	2.3.1 Creation of geographically specific techno-poles and technology corridors to attract private sector investment in a limited geographic area.																				
2.4 Promote Intellectual Property Development and Registration	2.4.1 Develop and deliver capacity building programs for researchers, academics and private sector on IP, the benefits of IP registration and technology commercialization.																				
	2.4.2 Provide support to companies and the legal community on the IP registration process (registration, legal																				

		2013				2014				2015				2016				2017			
	services, etc.)																				
	2.4.3 Facilitate collaboration through incentives that encourage universities to develop IP in partnership with the private sector targeting their needs																				
	2.4.4 INT@J to lead a national program to identify IP which already exists in existing Jordanian ICT products and services.																				
2.5 Support ICT Innovation Centers	2.5.1 Develop a program to support the development of business/innovation centers or incubators as well as Technology Transfer offices																				
3.1 Facilitate intersections between ICT and other high value added sectors	3.1.1 Hold one meeting every quarter between interested INT@J members and members of relevant associations:																				
	3.1.2 Identify opportunities for the public and private sectors to develop proof of concept products and services at cost or for free in which the private sector will be able to use these products to develop exports to similar institutions or use the technology[2].																				
3.2 Identification of technical barriers hindering export of Jordanian ICT	3.2.1 Identify international and WTO export requirements which are hindering or affecting exports of Jordanian ICT products and																				

		2013			2014					2015				2016				2017			
products and services.	services.																				
3.3 Export facilitation to target markets	3.3.1 ICT Export barometer development																				
	3.3.2 Establish export technical assistance and capacity building for ICT companies:																				
	3.3.3 Develop and implement an ICT companies rating model to promote maturity of companies and enhance exports opportunities.																				
	3.3.4 Publishing Export Market Reports																				
	3.3.5 Collaboration with International Companies for Export																				
	3.3.6 Develop Regional and Global Links for Export																				
	3.3.7 Building National Consortia in Various Fields to consolidate the export capabilities of the ICT sector and sector companies.																				
	3.3.8 Finalize establishing a National Software Quality Accreditation and certification center.																				
3.4 National export house to develop markets for Jordanian ICT companies.	3.4.1 Establish a national ICT export house funded by the private sector and managed as a profit making entity, focusing on the markets identified by Export Market Reports																				

		2013				2014				2015				2016				2017			
4.1 Update ICT infrastructure to be an enabler for continuous innovation in technology trends:	**4.1.1 If deemed commercially feasible by the operators/investors; Installation of national Internet Exchange Point (IXP) through which ISPs exchange Internet traffic between their networks.**																				
	4.1.2 If deemed commercially feasible by operators/investors; upgrading the existing public telecommunications network to an advanced NGN network																				
	4.1.3 Organization of 4G frequency auction.																				
	4.1.4 If deemed commercially feasible by operators/investors; Upgrading existing mobile networks to LTE based network																				
	4.1.5 If deemed commercially feasible by operators/investors; Establish a regional cloud computing center																				
4.2 Private sector exploitation/use of NBN	4.2.1 Facilitating partial or complete private sector exploitation/use of NBN.																				
4.3 Unbundled and shared access to local loops and sub loops	4.3.1 Ensuring the provision of physical network infrastructure access services such as Local Loop Unbundling and all forms of unbundled and shared access to local loops and sub loops at each feasible location including access to associated facilities and services on a nondiscriminatory basis																				

		2013				2014				2015				2016				2017			
4.4 Infrastructure and facilities sharing	4.4.1 Enforcing infrastructure and facilities sharing between operators, and encouraging sharing of facilities with public utilities (such as electricity providers), at reasonable prices and conditions, in order to reduce the costs of providing and extending Internet service.																				
4.5 Implementing Number Portability	**4.5.1 Implementing number portability, if deemed feasible, to facilitate customer choice among telecom service providers.**																				
5.1 Work with all existing training and educational institutions to provide agile, sector responsive technical and managerial training to address the needs of the local ICT industry.	5.1.1 Identify, validate and document training and technology needs from ICT sector players through sector focus group sessions and questionnaires.																				
	5.1.2 Identify local, regional and international institutions/individuals that can supply the required training and provide certification if necessary.																				
	5.1.3 Contact existing educational institutions (PSUT, JUST, U of J, Al-Quds College, EJABI, RSS, etc.) to determine willingness to host or provide professional training and certification on behalf of the sector.																				

		2013				2014				2015				2016				2017			
	5.1.4 The private sector to define a professional IT skill qualification framework and a model CV for workers in the ICT sector.																				
5.2 Establish and operate a training and certification (Bridging) center/program to meet local and regional ICT technical and managerial needs	**5.2.1 Establishment of a professional training and certification (Bridging) center/program . (Existing Bridging programs are to integrate under this center)**																				
5.3 Maintain knowledge of what the ICT sector requires in terms of skills locally and regionally.	5.3.1 Conduct at least one study every year to identify the skills needed to meet the needs of the local and regional ICT sector taking into consideration expected industry trends and shifts in these trends.																				
6.1 Increase awareness among potential users of where and how digital content can be developed.	6.1.1 Hold seminars at universities and high schools where local content developers can speak about their craft, the required skill sets and available opportunities. These seminars and workshops can be communicated as CSR opportunities for local content developers.																				
	6.1.2 Develop a national award for content development which evaluates the creativity and innovation in the content as well as the creativity and innovation in																				

		2013				2014				2015				2016				2017			
	the usage of the content.																				
	6.1.3 Integrate ICT use into university curriculum in areas such as journalism (facebook use, twitter use, etc.), drama and the arts which are becoming ICT and digital content heavy.																				
	6.1.3.1 Alternatively use the professional development training through the bridging institute/program to deliver these courses.																				
6.2 Improve the regulatory regime to Accelerate convergence between ICT and innovative audio visual and to proactively facilitate content	6.2.1 Identify and prioritize legislative and regulatory gaps between what currently exists in the Jordanian business environment with international best practice to accelerate convergence and content development growth.																				
	6.2.2 Review the appropriateness of the existing publications and audio visual laws to make sure that they are aligned witth best practices and do not hinder convergence and content development development and identify areas of weakness in these two laws																				

		2013				2014				2015				2016				2017			
	6.2.3 Propose amendments to existing laws which affect convergence and govern the content industry to bring them in line with international best practices and to make them as proactive tools for content development (this is to include proposed amendments to the publications and audio visual laws).																				
6.3 launch a content industry development program	**6.3.1 Conceptualize, fund and launch a content industry development program to accelerate digital content development within the local industry.**																				
6.4 Provide incentives for GoJ entities to develop an inventory of useful digital content.	**6.4.1 Provide incentives (E-government award) to GoJ entities to develop, launch and use E-services.**																				

Annex 7

Benchmarking With Select Asian National ICT Strategies:

ICT strategies are effective tools in promoting economic growth. It is for this reason that Jordan is trying to develop and implement an effective national ICT strategy. The 1992 Nobel Laureate for Economics, Gary Becker, has pointed out that "from 1995 to 2000, almost all of the improvements in productivity (in the US) were either due to investments in information technology or advances in the output of information technology related goods"[44]. Becker also believes that the effect of the IT revolution is only beginning to be felt: "...with long-term growth in output per worker estimated at a rate of 3 percent per year or higher for perhaps decades. Income per worker could double in 25 years or less."[45] The positive effect of IT on the economy is felt not only in the US but elsewhere as well. An empirical study on the Digital Divide indicates that a one point increase in Infostate (a country's stock of ICT capital and labour, and their uptake and use) leads to an increase of anywhere between US$124 to US$164 in per capita Gross Domestic Product (GDP)[46].

If one looks at several Asian economies each at varying stages of development, one will recognize that Information and Communication Technologies (ICTs) are seen to be instrumental in the development of countries. ICTs allows nations to achieve development goals faster and more efficiently. ICTs enable development in at least three key ways:

1. Enhance access to and creation and sharing of knowledge.
2. Effectively speed up the production process and facilitate financial transactions throughout the economy while reducing costs.
3. Connect individuals, groups, enterprises, communities and governments faster and more cost-effectively.

The role of ICT in development is being increasingly understood. Currently, governments are focusing on improving their respective ICT infrastructures and addressing the 'digital divide' at the regional and global levels. A recent UNDP Asia Pacific Development Information Programme reviewed of the ICT policies and e-strategies of nine Asian countries: India, Japan, Republic of Korea5, Malaysia, Nepal, the Philippines, Singapore, Sri Lanka, and Viet Nam. The objective of the study was to document the ICT policies (e-policies) and ICT strategies (e-strategies) of these countries and assess of how they are shaping their legal and regulatory environment to take advantage of ICTs as a developmental tool. To make relevant comparisons, the UNDP – APDIP study categorized the nine countries being evaluated into three categories: High Income (Japan, Republic of Korea and Singapore), Middle Income (Malaysia, Philippines, Sri Lanka) and Low Income (India, Nepal and Viet Nam). For the purposes of this report, only high and middle

[44] Becker, G. S. 'The productivity boom is just warming up', BusinessWeek, 20 Oct 2003, p. 16.

[45] Ibid

[46] George, S. Measuring the Digital Divide and Beyond, p. 87.

income countries will be reviewed.

High Income Countries: High-income countries stand out in this study because they have laid the foundation for ICT development since the 1970s. In Japan, "[t]he phrase johoka – usually translated as 'informatization' and signifying change to an information-oriented society – has been a slogan of Japanese government policy (since the 1970s)"[47] . Singapore's first IT master plan was formulated and implemented between 1980 and 1985. Korea's first national computerization project was initiated in 1987. Japan, Korea and Singapore started the debate on the role of ICTs in development much earlier than the other countries in this study. They also developed and successfully implemented a number of 'integrated' ICT for Development (ICT4D) master plans – plans in which telecommunications and IT policies were not developed separately but constituted one coherent design.

Japan

The 'e-Japan Strategy' was a national strategy for information technology (IT) on 22 January 2001[48]. e-Japan foresees a society "where everyone actively utilizes IT and fully enjoy its benefits". To achieve this goal, government must "create an environment where the private sector, based on market forces, can exercise its full potential and make Japan the world's most advanced IT nation within five years".

The specific goals of the e-Japan strategy are to:

- Build an ultra-high-speed Internet network and provide constant Internet access at the earliest date possible;
- Establish rules on electronic commerce;
- Realize an electronic government; and
- Nurture high-quality human resources for the new era.

The 'Basic IT Strategy' (formulated in November 2000) preceded the e-Japan Strategy. The 'Basic Law on the Formation of an Advanced Information and Telecommunications Network Society' (the 'IT Basic Law', enacted on 6 January 2001). The IT Basic Law calls for the "promotion of an Advanced Information and Telecommunications Network Society, and providing stipulations on the development of a priority policy programme for the formation of an advanced information and telecommunications network society". Japan launched 'Towards an Advanced Information Society' in 1995, which was augmented with a mid-term plan and action plans in 1996 and 1998[49].

'e-Japan Strategy II' was launched in July 2003 aiming to create a "vibrant, safe, impressive and convenient" society with the active use of IT. The new strategy proposes to implement leading measures in seven areas that are closely related to the lives of the people: medical treatment; food; life; small- and medium-sized enterprises; finance; knowledge; employment; and

[47] West, J., Dedrick, J. and Kraemer, K.L. 'Back to the Future: Japan's NII Plans', in Kahin and Wilson, National Information Infrastructure Initiatives, p. 66. 15

[48] See www.kantei.go.jp/foreign/it_e.html

[49] An Overview of ICT Policies and e-Strategies of Select Asian Economies, UNDP Asia Pacific Development Information Programme

government service. The strategy also seeks to advance the development of a new IT social infrastructure, which is essential for the sophisticated use of IT during this second phase.[50]

Korea

The Korean government unveiled its fourth ICT master plan in December 2003, called 'Broadband IT Korea Vision 2007'. The new master plan focused on improving national productivity and the quality of life through informatization. It strategy called for doubling Korea's IT exports from US$46.3 billion in 2003 to US$100 billion in 2007. It also envisioned the commercialization of telematic applications, next-generation computers and sophisticated service robots. The strategy provided for the creation of a 'Broadband convergence Network' (BcN) that will increase data transmission rate by 50 percent and fuel the nation's growth[51].

Korea's third master plan, 'e-Korea Vision 2006', embodied the belief that "the promotion of informatization in all aspects of society would lead to increased effectiveness of all socio-economic activities, higher national performance, and higher quality of life."[52] Its designated objectives were to:

- Maximize the ability of citizens to utilize ICT to actively participate in the information society;
- Strengthen global competitiveness of the economy by promoting informatization in all industries;
- Realize a smart government structure with high transparency and productivity through informatization efforts;
- Facilitate continued economic growth by promoting the IT industry and advancing the information infrastructure; and
- Become a leader in the global information society by playing a major role in international cooperation.

Singapore

Singapore has been a very proactive country in implementing ICT strategies. Singapore has implemented five strategies since the 1980s and is in the process of implementing a sixth strategy targeting the development of an intelligent nation. The interesting characteristic of Singapore's strategies is that they have focused and almost uni-dimensional in nature. The first national strategy focused in computerization. The first strategy focused on computerization of the civil service, the development of the computer industry and the developing a pool of qualified computer professionals. Singapore's second strategy focused on communications. The second strategy focused on the provision of one-stop=services through cross agency linkages. Integrating manual processes through the use of IT established sector specific networks such as TradeNet, LawNet and MedNet. Singapore's third strategy focused on connectivity and content. The third strategy sought ways to enable everyone to access IT and envisaged the development of national information infrastructure which would evolve to become the world's first National

[50] Ibid

[51] Tae-gyu, K. 'Korea Aiming to Double IT Production by 2007';
http://www.times.hankooki.com/lpage/biz/200312/kt2003121717253411860.htm.

[52] http://www.mic.go.kr/index.jsp

Broad Band Network. The fourth strategy (at the turn of the millennium) was to dotcom the public, people and private sectors by putting the "e" in as many domains as possible. Numerous public services went on-line and many companies ventured into e-commerce. The fifth strategy focused on unleashing national potential and releasing capabilities by strengthening capability development, technology planning and improving the business environment[53].

Singapore is currently implementing 'Connected Singapore', the sixth strategy, with its vision of 'infocomm' (Information Technology and Communications) as "a key enabler, unleashing the potential of individuals, organizations and businesses to become more productive and efficient, and to create new ideas that enrich lives and produce new value"19. This, Singapore's fifth ICT master plan, will be implemented through four 'galvanizing strategies':

- Infocomm for Connectivity, Creativity and Collaboration – which aims to drive the development of an infocomm infrastructure for pervasive and secure access, promoting the development of useful applications for work, play, lifestyle and learning, encouraging usage of applications and services; and promoting infocomm literacy.
- Digital Exchange – a strategy to develop Singapore as a leading global digital distribution and trading centre to create a new source of growth and extend Singapore's hub status in the digital medium.
- Engine of Growth – which aims to grow new economic activities and create jobs in infocomm, emphasizing opportunities that leverage Singapore's traditional hub status.
- Agent for Change – a strategy that aims to help businesses and government agencies use infocomm to achieve higher efficiency, effectiveness and customer satisfaction.

Middle Income: Countries in the middle-income group – Malaysia, the Philippines and Sri Lanka – have integrated ICT strategies as part of their national development strategies. The Malaysian government plays a more active role in promoting ICT development in the country. The Philippines has a more market-led approach. Sri Lanka, emerging from decades of civil war, is looking to use ICTs to develop its economy, alleviate poverty, and improve the quality of life and opportunities for all of its citizens.

Malaysia

The Malaysian National IT Agenda (NITA), launched in 1996, serves as the main policy statement on the development of ICT in Malaysia. The Eighth Malaysia Plan (2001), states that NITA provides "the framework for the systematic development of the country into an information and knowledge-based society by 2020"[54]. NITA's theme is 'Turning Ripples into Tidal Waves'. The 'ripples' are essentially specific initiatives by the government – such as the Multimedia Super Corridor (MSC) – that are aimed at providing the necessary environment to empower the people, who in turn are expected to bring about the 'tidal wave' of change[55]. The NITC, which is the apex

[53] Building Singapore's Next Generation Nationwide Broadband Network, Infocomm Development Authority of Singapore

[54] http://www.nitc.org.my/

[55] An Overview of ICT Policies and e-Strategies of Select Asian Economies, UNDP Asia Pacific Development Information Programme

ICT body in Malaysia, has formulated an NITC Strategic Agenda with five key thrust areas to enable the country to "migrate to the e-World of the new millennium". These are:

- E-Community – to enhance the quality of life of all Malaysian communities through ICT;
- E-Public Services – to get the public, private and community sectors to collaborate on an ongoing basis to enable the provision of people-oriented, customer-focused services electronically;
- E-Learning – to create and develop, through ICT, formal and informal learning networks for communities, with the goal of cultivating an ethos of life-long, continuous learning for individual, organizational and social advancement;
- E-Economy – to oversee the optimal usage of ICT in developing a knowledge economy,
- making it grow and become globally competitive;
- E-Sovereignty – to focus on building a resilient national identity. It is envisioned that citizens and institutions zero in towards enhancing national identity, integrity and societal stability in the face of borderless challenges to the nation.

The MSC is an important component of the Malaysian e-strategy. It is a dedicated 15 x 50 kmcorridor outside Kuala Lumpur that aims to attract global ICT companies to undertake research, develop new products and technologies, and export from this base21 . Conceptualized in 1996, the MSC was envisioned to become a global test bed for ICT applications. MSC was also envisioned to be the ideal growth environment for Malaysian ICT Small and Medium Enterprises (SMEs) seeking to transform themselves into world-class companies. To attract targeted companies, the Malaysian government committed to the following four promises: a Bill of Guarantees, world-class infrastructure, a suite of cyberlaws, and incentives. At the end of MSC's three-phased development, it is anticipated that Malaysia itself would become one Multimedia Super Corridor. The Communications and Multimedia Act of 1998 also provides the following all-encompassing policy objectives:

- To establish Malaysia as a major global centre and hub for communications and multimedia information and content services;
- To promote civil society where information-based services will provide the basis of continuing enhancements to quality of work and life;
- To grow and nurture local information resources and cultural representations that facilitate national identity and global diversity;
- To regulate for the long-term benefit of the end user;
- To promote a high level of consumer confidence in service delivery from the industry;
- To ensure an equitable provision of affordable services over the ubiquitous national infrastructure;
- To create a robust applications environment for end users;
- To facilitate the efficient allocation of resources such as skilled labour, capital, knowledge and national assets;
- To promote the development of capabilities and skills within Malaysia's convergence industries; and
- To ensure information security and network reliability and integrity.

The Philippines

In 1998, the Philippine government launched the National Information Technology Plan for the 21st Century. Named 'IT21', the plan describes the vision and strategy to leverage ICT to develop global competitiveness. It articulates the following goals and timeframes:

- By 2000: the Philippines will have installed the infrastructure for every business, every agency of government, every school, and every home in the Philippines to have access to information technology.
- By 2005: IT use will be pervasive in daily life. Philippine companies will be producing competitive IT products for world markets.
- Within the first 10 years of the 21st Century: the Philippines will be a Knowledge Centre in the Asia-Pacific; a leader in IT education, in IT-assisted training, and in the application of information and knowledge to business, professional services, and the arts.

A Government Information Systems Plan (GISP) was approved in July 2000 and adopted as a framework for all computerization efforts in the government (Executive Order 265). GISP was designed to create a governance system that will achieve: faster and better delivery of public goods and services; greater transparency in government operations; increased capacities of public sector organizations; and proactive participation of citizens in governance.

The Information Technology and Electronic Commerce Council (ITECC), the country's ICT policy-making body, defined its vision of the Philippines in 2003 as "an e-enabled society where empowered citizens have access to technologies that will provide quality education, efficient government service, greater source of livelihood, and a better way of life". Its more specific goals are to:

- Provide government services to stakeholders online;
- Develop an IT-enabled workforce;
- Develop the country as a world-class ICT services provider;
- Create an enabling legal and regulatory environment; and
- Provide affordable Internet access to all segments of the population.

ITECC identified significant projects to be completed by 2004 for each of the five goals. For example, for the goal of developing the Philippines as a world-class ICT service provider, ITECC undertook the following projects in 2003-2004:

- Setting quality standards and certification for individuals in support of IT services and IT-enabled services;
- Implementing a sustainable ICT skills survey;
- An International Communications and Marketing Programme;
- Aggregation of IT services and IT-enabled services groups through an industry-wide portal;
- Developing small and medium IT enterprises;
- R&D programme for niche ICT products in Centres of Excellence; and
- Enabling Capability Maturity Model for Software (CMM) certification for ICT firms.

The Philippine government created an e-Government fund in 2003. The e-Government fund amounted to approximately 4 billion pesos. Near half of the amount has been allocated to eight projects for various government agencies, including a portal for more than three million Overseas Filipino Workers (OFWs); a national business registration facility; automation of import declaration; an e-library; and an e-government portal. The creation in 2004 of the Commission on Information and Communications Technology (CICT) as the government's "primary policy, planning, coordinating, implementing, regulating and administrative entity… that will promote, develop, and regulate integrated and strategic ICT systems and reliable and cost-efficient communication facilities and services", is an important recent development[56].

Sri Lanka

e-Sri Lanka's vision is to "deliver the dividends of ICT to every village, to every citizen, to every business and also transform the way Government works"23. Sri Lanka hoped to achieve this vision by 2007 through a seven-programme strategy.

Programme 1 - Re-engineering Government aims to transform government business processes through the effective use of ICT, thereby making government more citizen-friendly and efficient. Included in this programme are efforts to automate proceedings and associated governing processes of the parliament; provide faster communication of documents between government offices; and encourage government leaders to use ICT in their day-to-day work.

Programme 2 - Building Information Infrastructure aims to: Provide a modern information and communication infrastructure that gives user-friendly access to all citizens; establish a legal infrastructure that is internationally aligned; and Establish common standards for an information security framework and infrastructure implementation architecture. Some key initiatives under this programme are the establishment of a network of Vishva Gnana Kendras (VGKs or Tele Centres) throughout the country for ICT connectivity and access for citizens; the installation of two broadband Regional Telecommunication Networks; and the establishment of a development-conducive telecommunications regulatory environment.

Programme 3 - ICT Human Resource Development aims to use ICTs to enhance education, increase the number and quality of high-level ICT professionals, and develop a computer-literate citizenry. The programme aims to build a workforce skilled in ICT use; increase the employment of graduates; strengthen teaching in primary and secondary schools, tertiary education and universities; and strengthen management and professional skills in the ICT industry.

Programme 4 - ICT Investment and Private Sector Development intends to achieve major economic and employment growth in Sri Lanka by using ICTs to re-engineer the local industry and to improve Sri Lanka's efficiency to compete effectively in the global marketplace, as well as to encourage multinational corporations to invest in Sri Lanka.

Programme 5 - E-Society aims to facilitate and promote awareness, training and capacity building to empower citizens in Sri Lanka, to create a fair and equitable information society. This programme will promote the use of ICTs to empower disadvantaged /unserved groups. It will also facilitate the development of innovative ICT applications for social and economic

[56] Executive Order No. 269, 'Creating the Commission on Information and Communications Technology', available at http://www.ops.gov.ph/records/eo_no269.htm

development based on Millennium Development Goals (MDGs), and set up a fund to support such initiatives.

Programme 6 - Technology Architectures and Security Standards aims to identify technologies, architectures, standards, security and privacy requirements of all programmes of the e-Sri Lanka initiative, including service provision, transaction processing and systems. It also aims to introduce the required technology and standards, ensure that Sri Lanka is adequately represented in international standardization efforts, and to promote research, development and excellence in the ICT sector in Sri Lanka.

Programme 7 - E-Leadership and Policy-making aims to use ICTs at different levels of government, thereby ensuring that ICT promotion will be driven by the national leadership and a shared vision.

How this relates to the Jordanian National ICT Strategy 2013-2017

Based on the benchmarking across the Asian countries above, it is clear that the Jordanian National ICT strategy must contain several elements to link economic development goals with ICT. Jordan's most pressing economic challenges are those of unemployment and trade deficit. Both these challenges can be addressed by proactively facilitating growth in ICT. Areas of focus are outlined in the following table:

ICT human resource development through professional training and certification.	Continually developing effective ICT infrastructure to provide a fertile ground for new product/service development and delivery.	Development of competitive ICT products and services facilitated by intersections with competitive Jordanian economic sectors.
Development of the local business environment to effectively promote digital content development and convergence.	Proactively develop exports and export opportunities for the sector.	Proactively identify and promote investment opportunities for local ICT companies and for national infrastructure development.
Communicate the importance of adopting/implementing ICT security standards as a means to develop trust.	Aggressively and flexibly manage radio spectrum as a means to facilitate innovation and sector growth.	Help create an e-empowered society by facilitating convergence through digital content development of frequently used e-government services.