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# NATIONAL ICT STRATEGY OF JORDAN 2007 – 2011

July 22, 2007

This publication was produced for review by the United States Agency for International Development. Review and input were made by Michael Capel, Laith Al-Qasem, Kinan Jaradat, Daniel Whitehead and Ayman Adhair

# NATIONAL ICT STRATEGY OF JORDAN 2007 - 2011

SUSTAINABLE ACHIEVEMENT OF  
BUSINESS EXPANSION AND QUALITY (SABEQ)

CONTRACT NUMBER: 278-C-00-06-00332-00

BEARINGPOINT, INC.

USAID/JORDAN  
ECONOMIC OPPORTUNITIES OFFICE (EO)

JULY 22, 2007

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DELIVERABLE N<sup>o</sup>: 4.5.5.3

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HOSTING THE FUTURE

# National ICT Strategy of Jordan

2007 - 2011





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Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Exports	\$ 40,000.00	\$ 40,037.00	\$ 69,728.00	\$ 79,410.00	\$ 162,620	\$ 203,274	\$ 264,257	\$ 343,534	\$ 446,594	\$ 580,572	\$ 754,744
Growth		\$ 37.00	\$ 29,691.00	\$ 9,682.00	\$ 83,209.52	\$ 40,654.88	\$ 60,982.32	\$ 79,277.02	\$ 103,060.12	\$ 133,978.16	\$ 174,171.60
Growth %		0.09%	74.16%	13.89%	104.78%	25%	30%	30%	30%	30%	30%
Domestic	\$ 130,000	\$ 188,447	\$ 226,183	\$ 361,103	\$ 418,254	\$ 543,730	\$ 679,663	\$ 815,596	\$ 937,935	\$ 1,078,625	\$ 1,240,419
Growth		\$ 58,447.00	\$ 37,736.00	\$ 134,920.00	\$ 57,151.13	\$ 125,476.24	\$ 135,932.59	\$ 135,932.59	\$ 122,339.33	\$ 140,690.23	\$ 161,793.77
Growth %		44.96%	20.02%	59.65%	15.83%	30%	25%	20%	15%	15%	15%
Total	\$ 170,000	\$ 228,484	\$ 295,911	\$ 440,513	\$ 580,874	\$ 747,005	\$ 943,920	\$ 1,159,129	\$ 1,384,529	\$ 1,659,197	\$ 1,995,162
Growth		\$ 58,484.00	\$ 67,427.00	\$ 144,602.00	\$ 140,360.64	\$ 166,131.12	\$ 196,914.91	\$ 215,209.61	\$ 225,399.45	\$ 274,668.39	\$ 335,965.37
Growth %		34.40%	29.51%	48.87%	31.86%	28.60%	26.36%	22.80%	19.45%	19.84%	20.25%
GDP				\$ 11,510,000	\$ 12,085,500	\$ 12,689,775	\$ 13,324,264	\$ 13,990,477	\$ 14,690,001	\$ 15,424,501	\$ 16,195,726
growth %					5%	5%	5%	5%	5%	5%	5%
Total IT Turnover size relative to GDP				3.83%	4.81%	5.89%	7.08%	8.29%	9.42%	10.76%	12.32%
CAGR 01-05											
42% Exports											
34% Domestic											
36% Total											
<b>Assumptions and clarifications:</b>											
<i>Assume GDP to grow at 5% every year between 2006 and 2010</i>											
<i>Assume larger growth rate of exports than local IT turnover</i>											
<i>Target a total IT turnover size of 1.6 billion US\$ by 2010.</i>											
<i>This turnover size would be around 11% of GDP size (but this DOES not mean it contributes 11% of GDP)</i>											
<i>The above is for IT only.</i>											
<i>For Telecom and Internet services, turnover in 2005 was more than 950 US\$ million</i>											
<i>So, by 2010, its total size could be between 1-1.2 billion US\$.</i>											
<i>So, by 2010, total ICT turnover should be between 2.6-2.8 billion in total REVENUES.</i>											
<i>The above includes hardware, software, Cellular, fixed, Internet, exports etc..</i>											
<i>This total size would be close to 20% of GDP (but DOES NOT MEAN it contributes 20% of GDP)</i>											
<i>If you assume a value add of 40%, then contribution to GDP would be 8-9% of GDP</i>											



## Executive Summary

The Hashemite Kingdom of Jordan has taken a very aggressive stance to improve life for its citizens. The foundation for that approach is Jordan's National Agenda. In support of the National Agenda, int@j, the IT industry association of Jordan, facilitated the creation of this National ICT Strategy, demonstrating how Jordan will move forward in cultivating an Information and Communications Technology (ICT) sector that serves as a major driver for overall economic growth in the Kingdom.

Governments and non-governmental organizations (such as the U.S. Agency for International Development, World Bank, and United Nations) worldwide have recognized the power of ICT to improve business, reduce poverty, improve public services, and encourage governmental improvements—as well as to be positioned as an industry in which developing countries can gain a competitive advantage. Countries can experience rapid growth in the ICT sector because it involves low capital costs and the principal inputs to ICT production are human resources. Therefore, Jordan is well-poised to build upon its strong foundation of people to cultivate growth in the ICT sector.

The National ICT Strategy serves two basic goals. First, it identifies the sub-sectors that national ICT sector leadership will be best-suited for growth given the environment in Jordan. Thus, the strategy poses a challenge to which the private sector in the country and internationally must respond. Second, it defines actions that Government must take to do its part to facilitate ICT sector growth. Thus, the strategy also poses a mandate to which the Government must respond to execute its commitment to the sector.

The strategy defines three high-level strategic objectives to achieve in five years: to increase the size of the ICT sector to \$3 billion, to increase employment in the ICT sector to 35,000, and to increase internet penetration—i.e., the number of people who use the internet—to 50% of the population. This reflects our premise that bridging the digital divide will help achieve not only direct ICT sector growth, but, more importantly, growth in the economy as a whole as well as improvement in citizens' quality of life.

Jordan faces most of the same challenges that other developing countries face in cultivating growth in the private sector and ICT industry in particular. In particular, growth of Jordan's ICT industry is hampered by Government policies that are lacking in either development or, more commonly, implementation. Jordan's telecommunications services are relatively well developed—and mobile phone penetration rates are high—but lack redundancy and broadband internet access is extremely expensive. This places PC ownership and technology utility beyond the reach of most Jordanians. Various legal and regulatory hurdles prevent the smooth operation of the market for ICT products and services. Moreover, the Government—the major buyer of ICT services in Jordan—lacks understanding of ICT and maturity as a consumer.

Ultimately, however, the private sector itself must be responsible for increasing the size of the industry. The private sector must work on increasing the day-to-day relevance of ICT among Jordanians and among Jordanian businesses. ICT firms must improve the maturity of their business practices to compete in the markets for investment funding and skilled professionals as well as in product markets.

ICT is perceived as an isolated industrial sector by most in Jordan. Real acceptance and adoption of ICT can only come through an understanding that ICT is a productivity and creativity tool which affects all businesses and all citizens. Thus, we recommend that Jordan focus on developing ICT-related businesses which develop and use digital content. Digital content development creates new jobs by harnessing the creative abilities of young Jordanians, helps improve sector revenues by creating competitive companies, serves the regional Arabic-speaking market, and facilitates increased internet penetration by creating and increasing its relevance for citizens. ICT use in the



creation of digital media facilitates the creation of high-value jobs as well as expands the market which Jordanian ICT companies serve.

The National ICT Strategy provides a number of initiatives to focus on such new markets and new market spaces, improve business maturity, invest in research and development, capitalize on regional demand, cultivate foreign investment, and improve the labor market for ICT professionals to spur growth. The strategy calls for an important role for int@j as well as ICT companies individually to seize the opportunity.



## Strategy Format

Int@j utilized a typical strategic planning framework to devise the National ICT Strategy. We began by formulating high-level strategic drivers, which represent our end-state vision—in terms of targets to achieve and challenges to overcome—for the ICT sector over the next five years, 2007-2011.<sup>1</sup> We then defined the specific solutions required—in the form of objectives, outcomes, and the actions needed to achieve them—to realize the strategic drivers. The following figure presents an overview of the framework:



The remainder of this section provides a brief overview of the elements of the framework. The remainder of the document presents the results in more detail.

<sup>1</sup> This strategy covers the period 2007-2011. The targets are intended to be fulfilled by the end of 2011. However, because the strategy was not formally adopted until half-way through 2007, some of the actions will last until mid-2012.





## Strategic Goals

Int@j reviewed the National Agenda, as well as other supporting studies and documentation. From this, we developed three primary strategic goals to be achieved over five years that will help move Jordan forward in its efforts to use ICT to improve the life of all Jordanians. These goals are:

- Internet usage penetration to reach 50% (from the current rate of 11%)
- ICT sector revenues to reach USD 3 billion (from the current USD 1.5 billion)
- ICT sector employment to reach 35,000 jobs (from the current 16,000)

The strategy aims to achieve these goals within five years, or by the end of 2011. Following is the rationale for each of these goals.

### Internet penetration

We believe that internet usage penetration, in and of itself, is a crucial objective for Jordan to reach the vision of the National Agenda. Internet penetration is defined as the percentage of the population that uses the internet at home, school, a community center, or some other location. We believe that a goal of 50% is an ambitious, yet achievable goal. It is consistent with current usage penetration levels for middle-income countries.

### ICT sector revenues

In 2005, ICT sector revenues were USD 1.53 billion: IT revenues were USD 580 million and telecommunications revenues were USD 950 million. Based on conservative assumptions about the annual growth of the market, combined with surveys of int@j members soliciting their business plans, we project IT revenues to reach USD 2 billion by 2011. We project that exports will drive most of this growth—themselves growing at 20-25% per year over the five-year period. (This would be even lower than int@j's preliminary projections of the ICT export growth rate for 2006.) A table summarizing our assumptions and calculations is provided in Appendix 9.

Therefore, even assuming that the telecommunications sector remains flat at its USD 1 billion 2005 level, total ICT revenues would be USD 3 billion by 2011. We believe that this represents a conservative assumption.

### ICT sector jobs

Employment in the ICT sector will grow in tandem to revenue growth. We estimate 35,000 jobs in five years based on assumptions analogous to those for ICT revenue growth. Moreover, international benchmarks show that the economy supports three jobs for every one job in the ICT sector, as ICT diffusion improves the efficiency and quality of production across the economy.

## Key Challenges

In parallel to defining the three high-level strategic goals, we identified four key challenges faced by the ICT industry in Jordan that the strategy must address to reach the goals:

- **Low internet penetration levels.** For a variety of reasons related to the supply and the demand for internet access, usage among Jordanians remains low.
- **Minimal level of R&D by global standards.** Jordanian ICT companies, the academic sector, and the Government do not invest in R&D at a level consistent with a mature, innovation-driven, internationally competitive industry.



- **Gap between academia and industry.** Jordanian universities do not produce enough ICT graduates with the competencies required to sustain growth in the industry. In addition, industry needs to communicate its skill needs, better cultivate talent, and facilitate a smooth labor market for ICT professionals.
- **Difficulty attracting and retaining ICT experts in Jordan.** Jordan is at a competitive disadvantage in the regional and international labor market in some ways. It needs to be more competitive to sustain high-value industry productivity and growth.

The National ICT Strategy identifies several strategic objectives and outcomes to mitigate these challenges to achieve the high-level strategic objectives.

## Hurdles

In addition to the four key challenges faced by the ICT industry in Jordan, we identified a number of systemic hurdles to the growth of ICT industry (and all industries, to different extents):

- **Government reluctance to support local industry.** Because the Government is such a large part of Jordan's economy, its actions as producer and consumer—as well as its policymaking, regulation, and executive roles—have a significant impact on the industry. Government could do more to support local industry—without compromising its mandate to serve the best interests of taxpayers and the community as a whole—in these roles.
- **Lack of continuity at Ministerial levels.** Frequent changes in Government leadership make it difficult to institutionalize any long-term strategy such as the National ICT Strategy. We propose a governance approach to overcome this hurdle while leveraging the necessary input and leadership of senior Government executives.
- **Taxation variations.** Taxation is often inconsistent over time or depending on which individual is interpreting the law. The Government needs to adopt simple, consistent (and low) taxes applicable to the industry.
- **Insufficient adoption of international business “best practices” among ICT companies.** Jordan's companies are immature, and need to adopt a number of improved business practices to improve international competitiveness.
- **Insufficient awareness as to the opportunities which can be afforded by ICT and poor understanding of ICT as a tool.** Jordanian companies have not yet begun developing products and services which harness the creative talents of the population. Meanwhile, the population does not understand the relevance of ICT as a tool to improve a variety of aspects of their lives.

The several strategic objectives and outcomes identified in the National ICT Strategy will help the Government and industry to overcome these hurdles and achieve the high-level strategic objectives.

## Pillars

We identified four dimensions, or pillars, of strategic activity necessary to fulfill the strategic goals:

- **Connectivity**
- **Research and Development**
- **Labor Issues and Education**
- **Regulation and Investment Climate**

Each challenge and hurdle poses requirements for action in one or more of the pillars. The pillars serve to organize the individual expertise that developed the strategy and to differentiate the strategic activities recommended by the National ICT Strategy.

## Strategic Objectives and Outcomes

We decomposed the three high-level strategic objectives into fourteen strategic objectives that must be achieved in order to fulfill the three high-level objectives. These strategic objectives are, by their nature, broad—requiring outcomes from multiple pillars and by multiple actors.



We further decomposed these fourteen objectives into 64 strategic outcomes that represent fulfillment of the objectives. (A few outcomes are replicated if they tie equally to multiple strategic objectives.) Each outcome is associated with a pillar based on the dimension of activity required. These outcomes can be measured—we assigned one or more performance indicators to most—and be fulfilled by one or more actions, or projects, to be conducted by various stakeholders. We prioritized the outcomes as high, medium, or low, based on their contribution to the strategic objectives. We also designated the sector (either government, industry, education, or higher education) that would ultimately be responsible for achieving the outcome. Although most of the outcomes require multiple sectors, in each case one sector must be ultimately accountable for each outcome.

Some of the strategic outcomes are directives to the private sector, particularly to focus on sub-sectors that we believe represent the best opportunity for the Jordan ICT industry to thrive (see figure to the right). We constructed these outcomes with the intention that private industry, including international investors, would focus on these areas.

## **Strategic Outcomes: Private Sector Industry Focus**

- ⇒ **Mobile-based technologies (Outcomes 2.1.1/2.1.2)**
- ⇒ **Content generation (Outcome 2.1.3)**
- ⇒ **Contact centers/outsourcing (Outcome 2.2.1)**

Other strategic outcomes require collaboration between the Government, primary and secondary education, higher education, and/or private sectors.

## **Actions**

We further decomposed the 64 strategic outcomes into actions, or specific projects to be conducted by one or more stakeholders to achieve the outcomes. For each project, we identified one lead stakeholder, e.g., int@j, private companies themselves, the Ministry of ICT (MoICT), Ministry of Higher Education and Scientific Research (MoHESR), universities themselves, the Telecommunications Regulatory Commission (TRC), the Ministry of Finance (MoF), the Ministry of Industry and Trade (MIT), etc., and any other stakeholders that should have a role.

### **Actions: Key Focus Projects for Immediate Implementation**

- ⇒ **Provide every university student with a laptop computer, financed creatively and factored into tuition (Action 1.3.3.1)**
- ⇒ **Activate the 1% R&D Fund to support new ICT companies (Action 2.4.3.1)**
- ⇒ **Mine labor data (from Social Security Corporation and universities) to assess gap between industry and**

Int@j will maintain the strategy and modify the list of projects over the five-year life of the strategy as needed to achieve the strategic outcomes. Some of the projects are very broad, and others are very narrow, but all must be specific enough to be executed. The strategy has listed

the actions in the form of a project plan. We will add successive levels of detail to each action/project as appropriate.

## **Conclusion**

In order for Jordan to come to grips with the challenges it faces today, it needs for Government and industry to sustain an active partnership, each taking ownership of its role in addressing the issues that exist in Government, business, and society. This strategy is intended to mark the first steps toward such a partnership and was developed through collaboration between industry and Government. By seeking out interactive, creative approaches to the problems facing the country, the ICT sector can spur growth in the economy, social development, and improvement in government. By reducing the digital divide among its citizens, the Government of Jordan can improve life across the board. Every step forward for the ICT sector is a step forward for Jordan as a whole. Int@j is pleased to be an integral part of transforming our business landscape and our society.



## Methodology

Int@j facilitated development of the strategy using a dual approach. The int@j board of directors and management conducted a “top-down” brainstorming to define the strategic drivers (high-level strategic goals, key challenges, and hurdles).

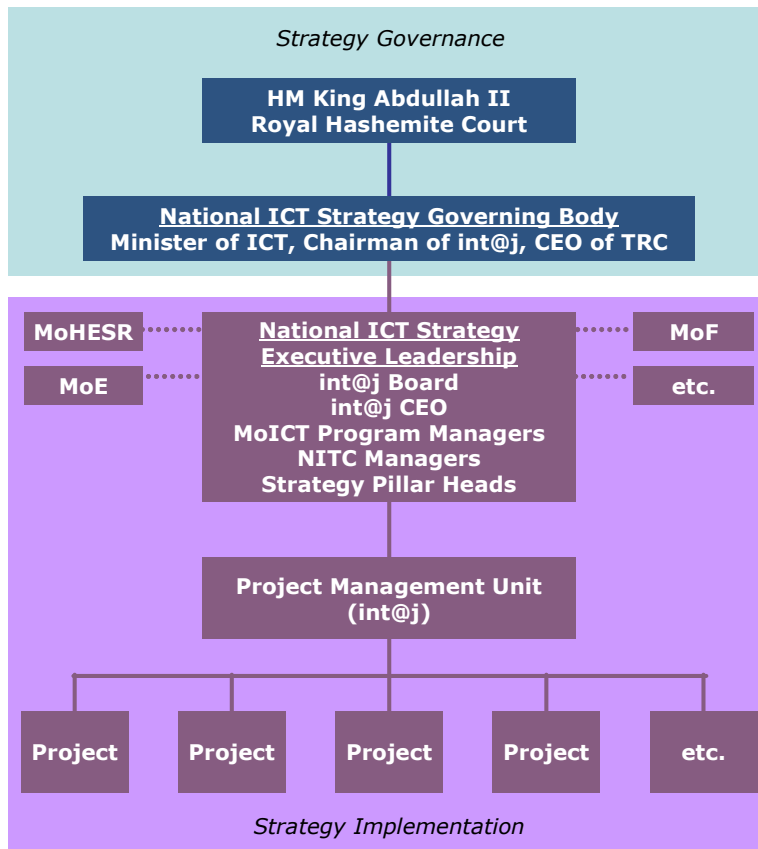
At the same time, pillar teams—led by a pillar head and pillar lead from industry and consisting of representatives from industry, Government, higher education, and donor organizations—constructed the strategic outcomes and actions using a “bottom-up” approach of broad brainstorming of specific actions. The pillar teams reviewed existing studies, reports, and documentation to determine what initiatives would be most applicable and effective in helping advance the ICT sector in Jordan. In particular, this strategy confirms the direction set by the National Agenda and adopts many recommendations from the National E-Readiness Assessment (2006) and the high-level Jordan ICT Sector Strategy created in early 2006. The pillar teams compiled a report on the current situation, then identified specific objectives, outcomes, and actions. The teams then conducted a series of workshops, both targeted and public, to discuss the findings and recommendations, and refined the material as a result. (Membership of these workshops is listed in Appendix 7.)

The int@j board re-convened and merged the “top-down” and “bottom-up” approaches by refining the strategic objectives and outcomes, ensuring a clear traceability between the strategic drivers and the specific actions to be conducted. This way, the outcomes could be prioritized, and the document could articulate a clear linkage between the high-level strategic drivers and the specific, actionable projects for which stakeholders can be held accountable. Int@j then facilitated sessions to rationalize the strategy with key strategies published by MoICT and the National Information Technology Center (NITC), and convened a final workshop with the executive leadership of these bodies—Their Excellencies, the Minister and Secretary-General of MoICT, Director-General of NITC, and CEO of TRC; as well as key managers from across MoICT—to reach consensus on the strategic objectives, outcomes, and actions.

The final strategy document was approved by the int@j board of directors and Government stakeholders. int@j leadership created a presentation to distill the strategy for discussion at the ministerial level and with His Majesty, King Abdullah II. The Chairman of int@j presented a preliminary view of the strategy to His Majesty on June 4, 2007. HM approved the strategy and directed int@j, MoICT, and the TRC to present the full document. Int@j facilitated completion of this document based on final input from all key stakeholders and published the final strategy document on July 22, 2007.

## Implementing and Governing the Strategy

Completion of this strategy document represents only the first step in achieving our targets for ICT sector growth over the next five years. Leadership in the Kingdom must commit to a steadfast, focused implementation mechanism, empowered with appropriate resources, in order to fulfill the strategy. Through development of the National ICT Strategy, we derived the following mechanism to govern implementation, maintenance, and monitoring of the strategy:



The following sub-sections describe each element.

## Activation of the Strategy and “Project Plan”

Once His Majesty, King Abdullah II approves the final version of this document, representing the consensus of the industry and key Government stakeholders, it will be necessary for HM to activate implementation of the strategy. The high-level strategic objectives, strategic objectives, outcomes, and actions constitute a “project plan,” or the list of actions required to achieve the strategic objectives and outcomes. Activation of the strategy will entail directing int@j to lead maintenance of this project plan. It will also entail directing int@j and Government stakeholders—especially MoICT, TRC, MoHESR, MoF, and MIT—to participate and execute the projects assigned to them. For those projects assigned to a stakeholder other than int@j—and hence for which int@j cannot direct the stakeholder to execute the project—int@j will work with the Government to secure and track cooperation of these stakeholders.

## Addressing Initial Resource Requirements

All of the projects to be executed by int@j or Government stakeholders require resources, based on the premise that investing in these activities will lead to a positive return in the form of achievement of the three high-level strategic objectives. Once the strategy is activated, int@j will provide the Royal Hashemite Court and Prime Ministry with a recommendation for modest resources to be allocated for implementation. In addition, concerned Ministries and other Government organizations—especially MoICT and TRC—will likely request budget allocations specifically tied to implementation of the strategy.



## **Governance**

Int@j will spearhead a National ICT Strategy governance body, consisting of the int@j Chairman, Minister of ICT, and CEO of the Telecommunications Regulatory Commission. This body will oversee implementation of the strategy and report periodically to HM on progress with implementation.

## **Maintenance of the Project Plan**

Each action is a project in and of itself, to be conducted by int@j or another stakeholder. Int@j will create a “project management unit” to maintain this project plan over the life of the strategy, modifying and adding additional detail to the action level as appropriate. The unit will be directed by the National ICT Strategy executive leadership body—the int@j CEO, int@j board of directors, pillar heads, key MoICT program managers, and key NITC and TRC managers—and will work with standing pillar teams and all other stakeholders, who will execute the projects within their respective pillars. It will track progress of the projects, based on int@j’s own activities and input received from other stakeholders, and report to the governance body.

## **Performance Measurement**

In addition to the three high-level measures of industry growth—internet penetration, ICT sector revenues, and ICT sector jobs—the strategy has devised performance indicators for most of the strategic outcomes. We formulated these with the intention that they be feasible to collect given data sources available in Jordan. The project management unit will track measurement of these indicators, in collaboration with the MoICT economic analysis unit, and will modify the list of indicators as appropriate over the life of the strategy.

## **Quarterly Reporting**

The project management unit and int@j leadership will produce a quarterly report of progress in implementing the strategy. The report will include an updated version of the project plan showing progress in performing the actions; challenges encountered; recommended updates to the strategic objectives and outcomes, if any (these should be minimal, especially for the first two years); measurements of (and updates to) the performance indicators; and a narrative account of progress in implementing the strategy. We expect to provide this report to the governing body and Royal Hashemite Court and hold periodic briefings with HM to update him on progress.



## **Holding Stakeholders Accountable**

The Royal Hashemite Court and Prime Ministry, or their designees, must be prepared to hold int@j and other stakeholders accountable for performance. The quarterly report will clearly list progress in performing activities that are part of the strategy.





## Rationale for the Strategy

Bridging the digital divide is an issue garnering significant international exposure. Organizations with a global focus on development, such as the United Nations and U.S. Agency for International Development, have recognized the role that Information and Communications Technology can play in developing countries. Some of the benefits of ICT identified, for example, in the UN's fourth annual ICT Task Force report include:

- The ability to improve growth in all businesses regardless of size and regardless of the country's stage of development
- The ability to reduce income inequality and poverty
- The ability to improve health and education services
- The ability to enhance social inclusion
- The ability to promote efficient, accountable, democratic government and reduce corruption.

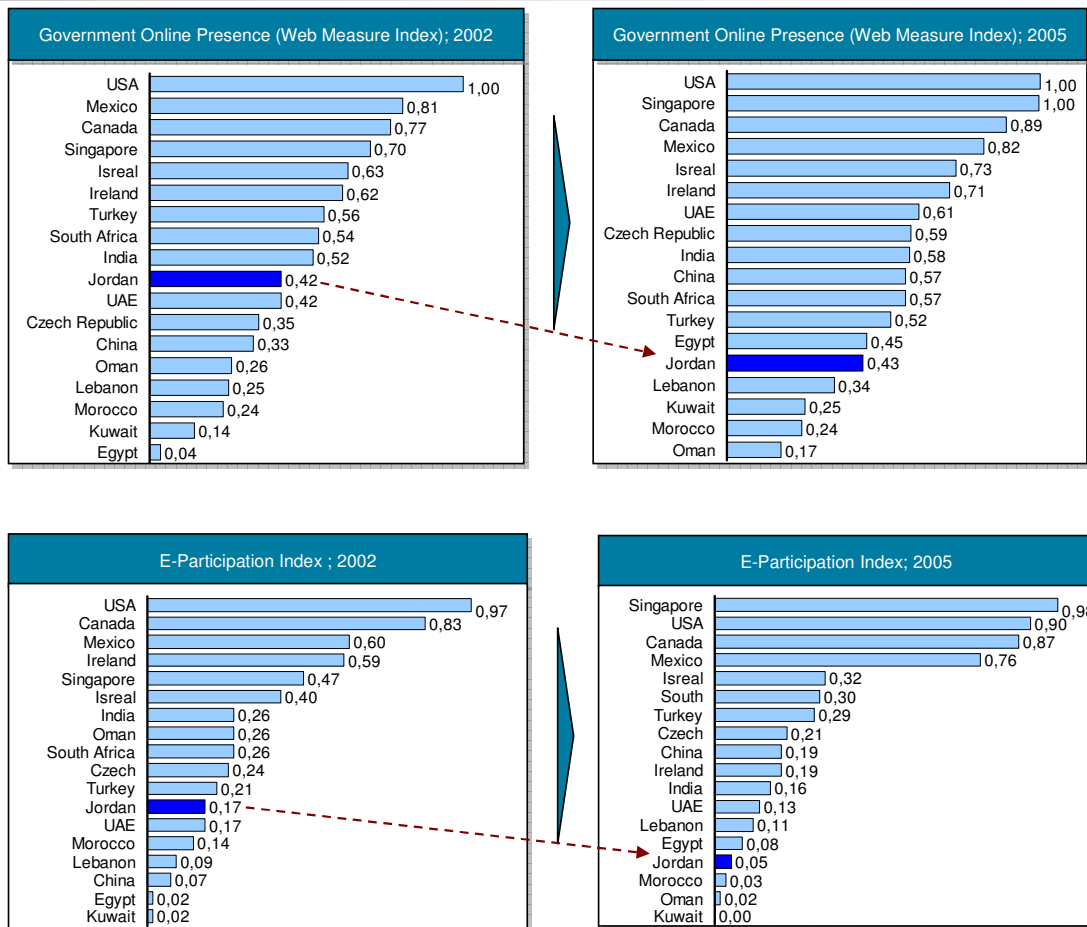
However, most emerging markets globally face significant challenges to capitalizing on ICT. Among them are:

- Insufficient policy and implementation capacity
- Opposition from vested interests
- Slow, unreliable, and expensive telecommunications services
- Limited incentives to change business models and operations structures
- Lack of trust
- Legal impediments.

Human resources—i.e., Jordan's well-educated, young population—are the primary resources needed to achieve ICT sector growth. Jordan is in an excellent position to leverage the ICT sector to drive economic progress and achieve the benefits listed above. However, like much of the developing world, Jordan faces many challenges. Most of the challenges documented in the UN Task Force's report apply to Jordan. As a result, although Jordan has made significant strides in its ICT sector, growth has been hampered by structural and cultural issues. Its progress has been very limited and, as a result, slower than that in much of the world.

According to the UN's Global e-Government Readiness Report, which tracks the institutions and infrastructure needed for e-government, which are analogous to those needed for e-commerce, Jordan's progress in this area has stalled in the last few years. Although Jordan's Government online presence increased slightly from 2002-2005, its ranking among the countries measured fell significantly:





Source: United Nations, Global e-Government Readiness Report; 2005; 2002

In order to fully benefit from the ICT sector, public and private entities must come together to identify the nation's priorities and find ways around the roadblocks that exist, both structural and cultural. Addressing these roadblocks will clear the way for Jordan to capitalize on its best natural resource, its workforce.

As the principal association for the ICT sector in Jordan, int@j took the lead in facilitating the conversation to identify, validate, and propose a national strategy by which the country may leverage its existing resources to benefit from ICT. The int@j board of directors also desired a strategy that built upon the work done previously. Rather than re-studying the issues, the board decided to incorporate ideas and suggestions from Jordan's existing strategy documents and previous studies.

The Jordan National Agenda acknowledges the role of ICT in transforming the society and sets specific goals to facilitate improvement. Some of these goals are:

- Developing a legislative and regulatory framework that is adaptable as new technologies emerge
- Improving the tariff schedules for fixed services access by using market forces as a driver
- Improving both the legal and competitive environment for mobile telecommunications
- Promoting the use of IT applications to develop the socio-economic climate.<sup>2</sup>



In addition to leveraging the National Agenda, we conducted a comprehensive review and gathered information from previous studies conducted. We also analyzed recent developments in the ICT sector from the vantage point of industry and Government leaders who work in the sector each day. The resulting report of this effort includes input from companies and Government entities across the sector.

## The Connectivity Pillar

The first pillar, which provides a foundation for all other activities, is the Connectivity pillar. This pillar encompasses access to and availability of the internet; affordability, quality and reliability; sector policy; and security. According to the 2006 Jordan e-Readiness Survey, connectivity and infrastructure are considered the most advanced elements of Jordan's e-Readiness profile.<sup>3</sup> (A summary of the survey results is provided in Appendix 2.) Even so, the digital divide in Jordan is significant. While some areas and types of connectivity like mobile phones have been trending down in cost, the cost of local phone calls, which would support basic dial-up connectivity, and of in-home broadband internet access, are high and in some cases have increased.

This is reflected in the results of the e-Readiness Survey by the Low/Medium ranking of affordability. The resulting low internet penetration rate presents a significant barrier to the ability of the ICT sector to positively impact Jordan's economy. Access, availability, and security had the next lowest rating in the e-readiness perception survey. All of these issues—related to cost as well as access—are a direct result of the competitive landscape and regulatory environment. Until these issues are resolved, the effectiveness of the ICT sector will continue to remain limited.

An overview of the current state of connectivity and penetration is provided below.

June 2006 Data	Arab Advisors
Mobile subscribers (000s)	3,826
Penetration %	69%
PSTN subscribers (000s) (Fixed line access)	629
Penetration %	11%
ADSL subscribers (000s)	41
ADSL as % of mainlines	7%
ADSL as % of population	0.74%

Data courtesy of Arab Advisors

E-Readiness Assessment Full Report	Assessment
Internet users (000s), est.	600
Penetration %	10.70%
PC Ownership	
Penetration % (est.), 2004	7.10%

Clearly, until low internet penetration rates and PC ownership rates are combated, the effectiveness of the sector will be negatively impacted.

<sup>3</sup> E-Readiness Assessment of the Hashemite Kingdom of Jordan, p. 18



## The Research & Development Pillar

The second pillar of the strategy is Research & Development (R&D). Although strides have been made in other parts of the sector, areas such as R&D still lag behind Jordan's desired achievement levels. The growth that has been experienced across the sector has been driven mostly by income generated from telecommunications and the re-sale of imported hardware and software, with minimum contribution of value-added solutions.

As a country, Jordan comprehends the significant role which R&D can play in its economic growth and its value to sustainable development. The Ministry of ICT publishes an R&D Strategy (which we incorporated into this strategy.) The National Agenda identified key performance indicators related to overall research and development, and set targets for its development, including the increase of overall R&D spending to 1% of GDP in 2012.<sup>4</sup>

Selected Performance Indicators for Scientific Research and Innovation

Key Performance Indicators	Current	Target (2012)	Target (2017)
Expenditures on R&D as a Percentage of GDP	0.34% (2003)	1.0%	1.5%
Number of Internationally Published Science Papers, as Indexed by Thomson ISI	485	1,300	2,500
Number of Patent Applications Submitted by Jordanians Since the Year 2000	246	1,300	5,000
Number of manuscripts deposited at the National Library Since the Year 1994	22,550	42,000	58,000

Jordan's National Agenda also set a number of objectives that are aimed at developing technology-related R&D activities. Some of these are<sup>5</sup>:

- Provide funding to strengthen the links between economic sectors and university R&D programs
- Provide incentives for private companies to participate in R&D
- Enhance patent registration and intellectual property protection
- Support R&D through direct financing and ensure links between investors and researchers
- Improve the overall quality of human resources capabilities.

In order to reach these objectives, the ICT sector must make a conscious commitment to developing R&D capacity and output. Although there have been success stories of effective R&D implementations, they have not been widespread. As a result of this lack of dedication to intentional development, R&D and innovation scored low in the Jordan e-Readiness assessment 2006. This is primarily as a result of insufficient local capabilities, focus, and spending on nationwide R&D.<sup>6</sup>

The local ICT industry is faced with a number of barriers and challenges that have historically inhibited its focus on R&D. These barriers must be removed for the innovation and research to move into marketable products and jobs. Removing these barriers and enabling effective R&D will require the dedication of both public and private entities and stakeholders. This partnership will allow Jordan to begin leading with innovative solutions and capitalizing on its human resources.

<sup>4</sup> National Agenda, p. 33

<sup>5</sup> National Agenda, p. 33

<sup>6</sup> e-Readiness Assessment, pp. 122-136.



## The Labor Issues & Education Pillar

The third pillar of the strategy is Labor Issues & Education. Improving and tailoring the overall labor and education arenas is a core enabler for the growth of the ICT sector, as well as for ICT deployment and capability throughout the general economy. It is critically essential that graduates emerging from the universities have the skills and competencies to add value to the sector as rapidly as possible. Competitiveness and employment flexibility is increased where the graduates hit the ground running as they leave third level education. In addition, continual skill update and improvement of professionals already in the workforce is required to keep Jordan moving forward in the ICT sector. Also a transfer of world-class technology and knowledge is necessary to ensure that Jordan keeps pace with the world.

Jordan has thrived in many aspects of the society during the past decade; however, many challenges remain to complete the transition to an information society. There have been increasing numbers of people graduating from ICT related fields and Jordanians have exceedingly become a sought-after workforce in the region and in the world. As a result, Jordan suffers from an emigration of its highly qualified workforce to other countries. This "brain drain" negatively impacts the overall level of skills available in Jordan. The lack of close cooperation and alignment between the universities and the private sector is also causing a gap between the industry's needs and the skill sets of fresh graduates.

According to Richard Florida in his book, *The Rise of the Creative Class*, cities must bring in creative people if they wish to bring in creative industries. Developing, attracting, and retaining this creative class is a major goal to be achieved in the ICT sector and for the ICT industry in Jordan. Achieving this goal requires close cooperation and collaboration of the different public and private sector stakeholders and participants.

## The Regulation & Investment Climate Pillar

The Regulation and Investment climate in a country has a significant impact on its ability to attract investors, both local and global. An integrated series of regulations and laws, as well as measures to encourage investment, are required to bring in new monetary and technology investments. While general Foreign Direct Investment (FDI) has been on the rise, the ICT sector has seen little positive impact. Current regulations and laws are not designed to facilitate creation and closure of businesses and protection of intellectual property. As a result, other alternatives become more attractive.

The Telecommunications Regulatory Commission (TRC) must enable market competition, not stifle it. Improving the effectiveness of the TRC is one of the major prerequisites to allowing market outcomes to reduce the prices of internet access, and thereby increase internet penetration, as well as forming the foundation for internet-based sub-sectors. Another major governmental aspect that must be addressed is the high and variable taxation rates of ICT activity in Jordan. Improved classification of industry activity, as well as Government commitment to treat this activity fairly, will result in lower costs to consumers and an expanded sector.

Jordan's laws and, more importantly, implementation of those laws, discourages the creation of intellectual property. The courts are not knowledgeable enough to tackle the sticky legal questions that arise, making technology companies even more hesitant to enter. Removing these impediments would make Jordan a more attractive investment option, creating jobs, spurring growth and driving down prices for the consumer.



## Strategy Details

The following tables list the strategic objectives, strategic outcomes, and actions, as defined in the previous section.

### Table 1. Strategic Objectives and Outcomes

The following table lists the strategic objectives tied to the three high-level strategic objectives, and the strategic outcomes tied to the strategic objectives. The Pillar with primary relevance to the outcome is also listed.

Strategic Objectives	Outcomes (Pillar)
<b>(1) Internet usage penetration of 50%</b>	
(1.1) Enhance competition for fixed-line broadband internet service, resulting in lower prices	(1.1.1) Improve the effectiveness of the Telecommunications Regulatory Commission to promote a functioning competitive environment for fixed-line internet access (Connectivity Pillar) (1.1.2) Unbundle local loops effectively and fairly (Connectivity Pillar) (1.1.3) Enable sharing of infrastructure effectively and fairly (Connectivity Pillar) (1.1.4) Prevent anti-competitive behavior in the broadband market (Connectivity Pillar) (1.1.5) Increase competition in the internet backbone (Connectivity Pillar) (1.1.6) Establish a Universal Access/Service Fund (Connectivity Pillar)
(1.2) Enhance competition for wireless broadband internet service, increasing supply and resulting in lower prices	(1.2.1) Improve the effectiveness of the Telecommunications Regulatory Commission to promote a functioning competitive environment for wireless internet access (Connectivity Pillar) (1.2.2) Decrease barriers to market entry for more wireless operators and technologies (Connectivity Pillar) (1.2.3) Remove unnecessary restrictions on use of unlicensed frequencies and other technologies such as Wi-Fi in public space (Connectivity Pillar)
(1.3) Improve affordability of internet access and personal computers	(1.3.1) Gradually reduce sales taxes on internet access to the same level as other basic goods (Connectivity Pillar) (1.3.2) Eliminate sales tax to lower out-of-pocket cost for PCs (Regulation & Investment Climate Pillar) (1.3.3) Ensure that university students have a laptop computer (Labor Issues & Education Pillar)
(1.4) Increase interest and	(1.4.1) Focus on content development (Connectivity Pillar)



Strategic Objectives	Outcomes (Pillar)
capability to use the internet among the Jordanian population	(1.4.2) Increase IT capacity among students and teachers (Labor Issues & Education Pillar) (1.4.3) Improve connectivity and reliability of internet at public schools (Labor Issues & Education Pillar) (1.4.4) Deliver education-related content electronically (Labor Issues & Education Pillar) (1.4.5) Increase usage of Knowledge Stations to increase number of internet users (Labor Issues & Education Pillar) (1.4.6) Deploy previously piloted Jordan Education Initiative services and expand life-long learning (Labor Issues & Education Pillar)
(1.5) Increase demand for internet use by developing the e-government and e-commerce sectors	(1.5.1) Increase the number of relevant government-to-business and government-to-citizen services delivered electronically (Regulation & Investment Climate Pillar) (1.5.2) Promote more attractive internet-based services (e.g., IPTV, Triple-Play) (Connectivity Pillar) (1.5.3) Reduce barriers to Jordanian companies' ability to sell services over the internet to consumers in other countries (Regulation & Investment Climate Pillar) (1.5.4) Implement an internet usage code of ethics (Regulation & Investment Climate Pillar)
<b>(2) ICT sector revenues of \$3B</b>	
(2.1) Leverage high mobile phone penetration rates in Jordan and the region to promote development of new mobile-based technologies	(2.1.1) Increase investment in the market for mobile-based technologies targeted at Jordan and the Arab world (Connectivity Pillar) (2.1.2) Increase provision of value-added services (e.g., data services) by local mobile operators (Connectivity Pillar) (2.1.3) Focus on the cross-sectorial, regional content generation sub-sector (Connectivity Pillar)
(2.2) Promote Jordan as an outsourcing destination for contact centers and other functions	(2.2.1) Increase the reliability of the internet backbone (Connectivity Pillar) (2.2.2) Focus on the contact center/outsourcing sub-sector (Regulation & Investment Climate Pillar) (2.2.3) Increase tax exemptions applicable to contact centers/outsourcing providers (Regulation & Investment Climate Pillar) (2.2.4) Establish contact center/outsourcing industry clusters (Regulation & Investment Climate Pillar) (2.2.5) Focus on contact center/outsourcing jobs in vocational training centers (Labor Issues & Education Pillar)
(2.3) Focus on development of IT solutions/applications for growing niche sectors (e.g., health care, banking, gaming)	(2.3.1) Increase use of ICT applications in key sectors (Regulation & Investment Climate Pillar) (2.3.2) Promote adoption of international standards in vertical sectors (e.g., insurance, banking, government) that can be addressed by IT solutions (Regulation & Investment Climate Pillar)



Strategic Objectives	Outcomes (Pillar)
(2.4) Increase research and development spending by the private sector, promoting innovation in the ICT sector to improve international competitiveness	(2.4.1) Institutionalize R&D in the culture of ICT firms (Research & Development Pillar) (2.4.2) Increase venture capital funding available for small and start-up ICT development (Connectivity Pillar) (2.4.3) Activate the R&D Fund to fund projects in the ICT sector (Research & Development Pillar) (2.4.4) Institutionalize the concepts of innovation and intellectual property in Jordanian culture (Research & Development Pillar) (2.4.5) Promote foreign investment in R&D in Jordan (Research & Development Pillar) (2.4.6) Ensure that the legal framework exists to promote R&D (Regulation & Investment Climate Pillar) (2.4.7) Improve government support of R&D (Research & Development Pillar) (2.4.8) Improve the academic sector's contributions to industry R&D (Research & Development Pillar)
(2.5) Increase capacity in ICT firms to improve international competitiveness	(2.5.1) Improve understanding of competitive drivers of international ICT industry to identify gaps in Jordan's competitiveness (Regulation & Investment Climate Pillar) (2.5.2) Promote quality certification of ICT firms (Regulation & Investment Climate Pillar) (2.5.3) Improve business maturity of ICT firms (e.g., corporate governance, growth through merger and acquisition, marketing skills) (Regulation & Investment Climate Pillar) (2.5.4) Increase access to capital among ICT firms (Regulation & Investment Climate Pillar)
(2.6) Improve the business climate for the ICT industry	(2.6.1) Make it easier for foreign-owned business to open (Regulation & Investment Climate Pillar) (2.6.2) Create a national credit information bureau to facilitate access to credit for entrepreneurs (Connectivity Pillar) (2.6.3) Facilitate issuance of vocational licenses for incubator companies (Regulation & Investment Climate Pillar) (2.6.4) Streamline the process for closing a business (Regulation & Investment Climate Pillar) (2.6.5) Improve industry classification to facilitate private investment and government incentives targeted to the ICT sector (Regulation & Investment Climate Pillar) (2.6.6) Classify ICT service companies as "industry" by MoF (i.e., the 15% income tax rate) (Regulation & Investment Climate Pillar) (2.6.7) Maintain income tax exemption for exports (Regulation & Investment Climate Pillar) (2.6.8) Ensure that the ICT sector continues to be represented on appropriate government boards/committees/commissions and Ministry policy-making bodies (Regulation & Investment Climate Pillar) (2.6.9) Ensure a level playing field in government procurement laws and processes to give qualified local firms an opportunity





Strategic Objectives	Outcomes (Pillar)
	to compete (Research & Development Pillar)
	(2.6.10) Clarify roles to ensure that government organizations do not compete with the private ICT sector (Regulation & Investment Climate Pillar)
(2.7) Promote awareness and understanding of the importance of IT to businesses, resulting in companies leveraging IT to improve product quality and production efficiency	<p>(2.7.1) Increase awareness of the potential for IT-driven innovation and R&amp;D among companies across the economy (Research &amp; Development Pillar)</p> <p>(2.7.2) Increase linkages between int@j and other business associations and the Jordan Computer Society to promote IT diffusion in industry (Labor Issues &amp; Education Pillar)</p>
<b>(3) ICT sector jobs of 35,000</b>	
(3.1) Improve the ability of universities to supply ICT graduates with the skills that industry needs	<p>(3.1.1) Study historical labor market outcomes for ICT graduates to define gaps between supply and industry demand (Labor Issues &amp; Education Pillar)</p> <p>(3.1.2) Encourage incubators and other types of internships in the ICT industry for university students (Labor Issues &amp; Education Pillar)</p> <p>(3.1.3) Add more ICT-related coursework (technical and non-technical) to university curricula (Labor Issues &amp; Education Pillar)</p> <p>(3.1.4) Incentivize universities and professors to prepare graduates for jobs in ICT (Labor Issues &amp; Education Pillar)</p> <p>(3.1.5) Provide better job-search tools for universities and their graduates to use (Labor Issues &amp; Education Pillar)</p> <p>(3.1.6) Increase professors' capacity to teach relevant ICT skills (Labor Issues &amp; Education Pillar)</p>
(3.2) Improve Jordan's ability to attract ICT investment and skilled ICT professionals to come to or remain in the country	<p>(3.2.1) Implement efforts to retain ICT employees (Labor Issues &amp; Education Pillar)</p> <p>(3.2.2) Utilize the Jordan Diaspora to market Jordan to investors of Jordanian origin around the world (Labor Issues &amp; Education Pillar)</p>





## Table 2. Priorities, Sectors, and Performance Indicators

The following table lists the priority, primary sector responsible, and performance indicator(s) for each strategic outcome.

Priorities are defined as high, medium, or low. We created these definitions based on the contribution of the outcome to the parent strategic objective.

Although most outcomes require the participation of multiple sectors, the sector column represents the sector that must drive the outcome, and must be held accountable for the outcome. (Gov = Government, Priv = Private sector, HEd = Higher education, Ed = Primary/secondary education.)

Performance indicators are designed to be readily measurable, along with targets in where applicable. We will refine the indicators and targets over time. Some outcomes do not have ready indicators; for these, indications of success will be the high-level strategic objectives—i.e., 50% internet penetration, \$3B in ICT sector revenues, and/or 35,000 ICT sector jobs.

Outcomes (Pillar)	Priority	Sector	Performance Indicators (Target)
<b>(1) Internet usage penetration of 50%</b>			
(1.1.1) Improve the effectiveness of the Telecommunications Regulatory Commission to promote a functioning competitive environment for fixed-line internet access (Connectivity Pillar)	HIGH	Gov	<ul style="list-style-type: none"> <li>Salary of TRC members/staff</li> <li>Retention rate of TRC staff</li> <li>TRC spending on training per staff member</li> </ul>
(1.1.2) Unbundle local loops effectively and fairly (Connectivity Pillar)	HIGH	Gov	<ul style="list-style-type: none"> <li>Jordan Telecom providing a wholesale bit stream offer (Yes by Q3 2007)</li> <li>Jordan Telecom's local loop unbundled with retail minus pricing and clear, simple usage terms and conditions (Yes by Q3 2008)</li> <li>Monthly cost of in-home broadband internet access, as a percentage of average per-capita income</li> <li>Number of telecommunications companies in the market using their own infrastructure (2 by Q4 2011)</li> </ul>
(1.1.3) Enable sharing of infrastructure effectively and fairly (Connectivity Pillar)	HIGH	Gov	<ul style="list-style-type: none"> <li>Number of alternative internet service providers in the market (5 by Q4 2011)</li> <li>Monthly cost of in-home broadband internet access, as a percentage of average per-capita income</li> </ul>
(1.1.4) Prevent anti-competitive behavior in the broadband market (Connectivity Pillar)	MED	Gov	<ul style="list-style-type: none"> <li>Monthly cost of in-home broadband internet access, as a percentage of average per-capita income</li> </ul>



Outcomes (Pillar)	Priority	Sector	Performance Indicators (Target)
(1.1.5) Increase competition in the internet backbone (Connectivity Pillar)	HIGH	Gov	<ul style="list-style-type: none"> <li>Availability of international capacity besides the current fiber-optic line across the globe (FLAG)</li> <li>Service-level agreement for connectivity up-time provided by ISPs at average market prices</li> </ul>
(1.1.6) Establish a Universal Access/Service Fund (Connectivity Pillar)	LOW	Gov	<ul style="list-style-type: none"> <li>Universal Access/Service Fund established by Cabinet (Yes by Q3 2007)</li> </ul>
(1.2.1) Improve the effectiveness of the Telecommunications Regulatory Commission to promote a functioning competitive environment for wireless internet access (Connectivity Pillar)	HIGH	Gov	
(1.2.2) Decrease barriers to market entry for more wireless operators and technologies (Connectivity Pillar)	HIGH	Gov	<ul style="list-style-type: none"> <li>Number of providers of wireless broadband access (4 by Q4 2008)</li> <li>Amount of wireless spectrum available for civilian/commercial use</li> <li>Average monthly retail price of wireless internet access, as a percentage of per capita GDP</li> </ul>
(1.2.3) Remove unnecessary restrictions on use of unlicensed frequencies and other technologies such as Wi-Fi in public space (Connectivity Pillar)	MED	Gov	<ul style="list-style-type: none"> <li>Percentage of homes in which wireless internet access allows the home to have internet access</li> </ul>
(1.3.1) Gradually reduce sales taxes on internet access to the same level as other basic goods (Connectivity Pillar)	MED	Gov	<ul style="list-style-type: none"> <li>Sales tax rate on internet access (5% by Q1 2008, 0% by Q4 2008)</li> </ul>
(1.3.2) Eliminate sales tax to lower out-of-pocket cost for PCs (Regulation & Investment Climate Pillar)	MED	Gov	<ul style="list-style-type: none"> <li>Tax rate on PCs (0% by Q2 2008)</li> <li>Average price of a PC, as a percentage of per capita GDP</li> </ul>
(1.3.3) Ensure that university students have a laptop computer (Connectivity/Labor Issues & Education Pillar)	HIGH	Priv	<ul style="list-style-type: none"> <li>Percentage of entering university students who have a laptop computer (20% by Q3 2007, 75% by Q1 2008, 100% by Q4 2008)</li> </ul>
(1.4.1) Focus on the content development sub-sector (Connectivity Pillar)	HIGH	Priv	<ul style="list-style-type: none"> <li>Number of companies performing this activity</li> <li>Content generation sub-sector revenues</li> </ul>
(1.4.2) Increase IT capacity among students and teachers (Labor Issues & Education Pillar)	HIGH	Ed	<ul style="list-style-type: none"> <li>PC/connectivity penetration rate among primary school students</li> <li>PC/connectivity penetration rate among secondary school students</li> </ul>
(1.4.3) Improve connectivity and reliability of internet at public schools (Labor Issues & Education Pillar)	MED	Ed	<ul style="list-style-type: none"> <li>Percentage of primary schools with full broadband connectivity</li> <li>Percentage of primary schools with full broadband connectivity</li> <li>Percentage of secondary school students who use the internet at school</li> <li>Percentage of secondary school students who use the internet at school</li> </ul>
(1.4.4) Deliver education-related content electronically	HIGH	Ed	<ul style="list-style-type: none"> <li>Number of primary and secondary schools with ICT education programs</li> </ul>



Outcomes (Pillar)	Priority	Sector	Performance Indicators (Target)
<b>(Labor Issues &amp; Education Pillar)</b>			
(1.4.5) Increase internet usage and IT literacy through Knowledge Stations (Labor Issues & Education Pillar)	MED	Gov	<ul style="list-style-type: none"> <li>Number of citizens who use Knowledge Stations in an average month</li> <li>Number of different types of service (e.g., learning, various e-government) provided by Knowledge Stations</li> <li>Number of services provided by Knowledge Stations</li> <li>Number of JEI services offered</li> </ul>
(1.4.6) Deploy previously piloted Jordan Education Initiative services and expand life-long learning (Labor Issues & Education Pillar)	LOW	Gov	<ul style="list-style-type: none"> <li>Number of JEI services offered</li> </ul>
(1.5.1) Increase the number of relevant government-to-business and government-to-citizen services delivered electronically (Regulation & Investment Climate Pillar)	HIGH	Gov	<ul style="list-style-type: none"> <li>Number of G2B services on-line (5 by Q4 2008)</li> <li>Number of G2C services on-line (8 by Q4 2008)</li> <li>Percentage of G2C/G2B transactions performed on-line (80% by Q4 2011)</li> </ul>
(1.5.2) Promote more attractive internet-based services (e.g., IPTV, Triple-Play) (Connectivity Pillar)	MED	Priv	<ul style="list-style-type: none"> <li>Number of companies performing this activity</li> <li>Sub-sector revenues</li> </ul>
(1.5.3) Reduce barriers to Jordanian companies' ability to sell services over the internet to consumers in other countries (Regulation & Investment Climate Pillar)	HIGH	Gov	<ul style="list-style-type: none"> <li>E-Security and Privacy laws, regulations, and processes presented to Parliament (Yes by Q4 2008)</li> <li>E-Security and Privacy laws, regulations, and processes implemented (Yes by Q4 2009)</li> <li>E-Payment laws, regulations, processes, and technology presented to Parliament (Yes by Q4 2008)</li> <li>E-Payment laws, regulations, processes, and technology implemented (Yes by Q4 2009)</li> </ul>
(1.5.4) Implement an internet usage code of ethics (Regulation & Investment Climate Pillar)	LOW	Gov	<ul style="list-style-type: none"> <li>Internet usage code of ethics published (Yes by Q4 2008)</li> </ul>
<b>(2) ICT sector revenues of \$3B</b>			
(2.1.1) Increase investment in the market for mobile-based technologies targeted at Jordan and the Arab world (Connectivity Pillar)	HIGH	Priv	<ul style="list-style-type: none"> <li>Mobile-based technology applications sub-sector revenue</li> </ul>
(2.1.2) Increase provision of value-added services (e.g., data services) by local mobile operators (Connectivity Pillar)	HIGH	Priv	<ul style="list-style-type: none"> <li>Mobile-based technology applications sub-sector revenue</li> </ul>
(2.1.3) Focus on the cross-sectorial, regional content generation sub-sector (Connectivity Pillar)	HIGH	Priv	<ul style="list-style-type: none"> <li>Content provision sub-sector revenues</li> </ul>



Outcomes (Pillar)	Priority	Sector	Performance Indicators (Target)
(2.2.1) Increase the reliability of the internet backbone (Connectivity Pillar)	HIGH	Gov	<ul style="list-style-type: none"> <li>Availability of international capacity besides the current FLAG</li> <li>Service-level agreement for connectivity up-time provided by ISPs at average market prices</li> </ul>
(2.2.2) Focus on the contact center/outsourcing sub-sector (Regulation & Investment Climate Pillar)	MED	Priv	<ul style="list-style-type: none"> <li>Call center and other outsourcing sub-sector revenues</li> <li>Number of call center/outsourcing companies operating in Jordan</li> <li>Number of call center/outsourcing employees/seats in Jordan</li> </ul>
(2.2.3) Increase tax exemptions applicable to contact centers/outsourcing providers (Regulation & Investment Climate Pillar)	HIGH	Gov	<ul style="list-style-type: none"> <li>Call center and other outsourcing sub-sector revenues</li> <li>Number of call center/outsourcing companies operating in Jordan</li> <li>Number of call center/outsourcing employees/seats in Jordan</li> </ul>
(2.2.4) Establish contact center/outsourcing industry clusters (Regulation & Investment Climate Pillar)	HIGH	Gov	<ul style="list-style-type: none"> <li>Call center and other outsourcing sub-sector revenues</li> <li>Number of call center/outsourcing companies operating in Jordan</li> <li>Number of call center/outsourcing employees/seats in Jordan</li> </ul>
(2.2.5) Focus on contact center/outsourcing jobs in vocational training centers (Labor Issues & Education Pillar)	HIGH	Gov	<ul style="list-style-type: none"> <li>Number of people trained annually on contact center/outsourcing-related skills</li> </ul>
(2.3.1) Increase use of ICT applications in key sectors (Regulation & Investment Climate Pillar)	HIGH	Priv	<ul style="list-style-type: none"> <li>Percentage of non-IT companies using ICT applications to automate business processes</li> <li>Number of new consortia established to develop ICT solutions in new sectors (1 by Q4 2007, 2 by Q4 2008, 4 by Q4 2009)</li> </ul>
(2.3.2) Promote adoption of international standards in vertical sectors (e.g., insurance, banking, government) that can be addressed by IT solutions (Regulation & Investment Climate Pillar)	HIGH	Priv	<ul style="list-style-type: none"> <li>Number of banks adhering to BASEL-II</li> <li>Number of health care providers adhering to HL-7/ICD</li> </ul>
(2.4.1) Institutionalize R&D in the culture of ICT firms (Research & Development Pillar)	HIGH	Priv	<ul style="list-style-type: none"> <li>Research and development spending by ICT firms as a percentage of total size of ICT sector (1% by Q2 2012)</li> <li>Revenues resulting from R&amp;D-related activities (or new innovation) as a percentage of total ICT sector revenue (12% by Q2 2012)</li> <li>Percentage of R&amp;D-related revenue in the ICT sector generated from exports (40% by Q2 2012)</li> </ul>
(2.4.2) Increase venture capital funding available for small and start-up ICT development (Connectivity Pillar)	HIGH	Priv	<ul style="list-style-type: none"> <li>Venture capital Dinars invested in ICT industry annually</li> </ul>
(2.4.3) Activate the R&D Fund to fund projects in the ICT sector (Research & Development Pillar)	HIGH	Gov	<ul style="list-style-type: none"> <li>Annual disbursement of R&amp;D Fund (100% by Q2 2008)</li> </ul>



Outcomes (Pillar)	Priority	Sector	Performance Indicators (Target)
(2.4.4) Institutionalize the concepts of innovation and intellectual property in Jordanian culture (Research & Development Pillar)	HIGH	Priv	
(2.4.5) Promote foreign investment in R&D in Jordan (Research & Development Pillar)	MED	Priv	<ul style="list-style-type: none"> <li>Foreign investment Dinars in ICT-related R&amp;D</li> <li>R&amp;D-related investment as a percentage of total foreign direct investment in the ICT sector (25% by Q2 2012)</li> </ul>
(2.4.6) Ensure that the legal framework exists to promote R&D (Regulation & Investment Climate Pillar)	HIGH	Gov	<ul style="list-style-type: none"> <li>ICT-related research and development spending as a percentage of total size of ICT sector (0.1% by Q2 2012)</li> <li>Number of R&amp;D escrow services available in Jordan (3 by Q4 2008)</li> </ul>
(2.4.7) Improve government support of R&D (Research & Development Pillar)	HIGH	Gov	<ul style="list-style-type: none"> <li>ICT-related research and development spending by government and higher education as a percentage of total size of ICT sector (0.75% by Q2 2012)</li> <li>Number of government-support R&amp;D incubators/centers of excellence at universities and other institutions (e.g., science parks, incubators) (5 by Q2 2012)</li> </ul>
(2.4.8) Improve the academic sector's contributions to industry R&D (Research & Development Pillar)	MED	HEd	<ul style="list-style-type: none"> <li>ICT-related research and development spending by government and higher education as a percentage of total size of ICT sector (0.75% by Q2 2012)</li> </ul>
(2.5.1) Improve understanding of competitive drivers of international ICT industry to identify gaps in Jordan's competitiveness (Regulation & Investment Climate Pillar)	MED	Priv	<ul style="list-style-type: none"> <li>Value of ICT exports by Jordanian companies</li> </ul>
(2.5.2) Promote quality certification of ICT firms (Regulation & Investment Climate Pillar)	HIGH	Priv	<ul style="list-style-type: none"> <li>Number of Jordanian ICT companies with CMMI certifications</li> <li>Number of Jordanian ICT companies with ITIL certifications</li> </ul>
(2.5.3) Improve business maturity of ICT firms (e.g., corporate governance, growth through merger and acquisition, marketing skills) (Regulation & Investment Climate Pillar)	HIGH	Priv	<ul style="list-style-type: none"> <li>Existence of King Abdullah II Center of Excellence award category for ICT firm excellence (Yes by Q4 2008)</li> </ul>
(2.5.4) Increase access to capital among ICT firms (Regulation & Investment Climate Pillar)	LOW	Priv	
(2.6.1) Make it easier for foreign-owned business to open (Regulation & Investment Climate Pillar)	LOW	Gov	<ul style="list-style-type: none"> <li>Capital requirement for foreign investors seeking to open a business in Jordan</li> </ul>
(2.6.2) Create a national credit information bureau to facilitate access to credit for entrepreneurs (Connectivity Pillar)	MED	Gov	<ul style="list-style-type: none"> <li>Number of national credit bureaus serving Jordan (1 by Q1 2008)</li> </ul>



Outcomes (Pillar)	Priority	Sector	Performance Indicators (Target)
(2.6.3) Facilitate issuance of vocational licenses for incubator companies (Regulation & Investment Climate Pillar)	LOW	Gov	
(2.6.4) Streamline the process for closing a business (Regulation & Investment Climate Pillar)	LOW	Gov	<ul style="list-style-type: none"> <li>Number of days it takes to close a business</li> </ul>
(2.6.5) Improve industry classification to facilitate private investment and government incentives targeted to the ICT sector (Regulation & Investment Climate Pillar)	HIGH	Gov	<ul style="list-style-type: none"> <li>Adoption of an international standard for classifying ICT industry activity (Yes by Q2 2008)</li> <li>Use of the same classification system by MIT; MOF; including the Department of Taxation; MoPIC, including the Department of Statistics; JIB; and MoICT (Yes by Q2 2009)</li> </ul>
(2.6.6) Classify ICT service companies as "industry" by MoF (i.e., the 15% income tax rate) (Regulation & Investment Climate Pillar)	HIGH	Gov	<ul style="list-style-type: none"> <li>Tax rate on ICT companies' income (15% by TBD)</li> <li>Use of the same classification system by MIT; MoF; including the Department of Taxation; MoPIC, including the Department of Statistics; JIB; and MoICT (Yes by Q2 2009)</li> </ul>
(2.6.7) Maintain income tax exemption for exports (Regulation & Investment Climate Pillar)	HIGH	Gov	<ul style="list-style-type: none"> <li>Tax rate on exports (0% by 2012)</li> </ul>
(2.6.8) Ensure that the ICT sector continues to be represented on appropriate government boards/committees/commissions and Ministry policy-making bodies (Regulation & Investment Climate Pillar)	MED	Gov	<ul style="list-style-type: none"> <li>ICT sector representation on identified commissions (100% by Q4 2008)</li> </ul>
(2.6.9) Ensure a level playing field in government procurement laws and processes to give qualified local firms an opportunity to compete (Research & Development Pillar)	HIGH	Gov	
(2.6.10) Clarify roles to ensure that government organizations do not compete with the private ICT sector (Regulation & Investment Climate Pillar)	MED	Gov	
(2.7.1) Increase awareness of the potential for IT-driven innovation and R&D among companies across the economy (Research & Development Pillar)	LOW	Priv	
(2.7.2) Increase linkages between int@j and other business associations and the Jordan Computer Society to promote IT diffusion in industry (Labor Issues & Education Pillar)	LOW	Priv	



Outcomes (Pillar)	Priority	Sector	Performance Indicators (Target)
Pillar)			
<b>(3) ICT sector jobs of 35,000</b>			
(3.1.1) Study historical labor market outcomes for ICT graduates to define gaps between supply and industry demand (Labor Issues & Education Pillar)	HIGH	Priv	<ul style="list-style-type: none"> <li>Study published (Yes by Q4 2007)</li> </ul>
(3.1.2) Encourage incubators and other types of internships in the ICT industry for university students (Labor Issues & Education Pillar)	HIGH	Priv	<ul style="list-style-type: none"> <li>Number of incubator programs at universities providing internships to ICT students</li> <li>Number of university students employed as interns in the ICT industry</li> </ul>
(3.1.3) Add more ICT-related coursework (technical and non-technical) to university curricula (Labor Issues & Education Pillar)	MED	HEd	
(3.1.4) Incentivize universities and professors to prepare graduates for jobs in ICT (Labor Issues & Education Pillar)	HIGH	HEd	<ul style="list-style-type: none"> <li>Number of ICT graduates from universities annually</li> <li>Employment rate of ICT graduates</li> <li>Number of new college graduates working in ICT sector</li> </ul>
(3.1.5) Provide better job-search tools for universities and their graduates to use (Labor Issues & Education Pillar)	MED	HEd	<ul style="list-style-type: none"> <li>Employment rate of ICT graduates</li> <li>Number of ICT graduates hired by Jordanian firms annually</li> </ul>
(3.1.6) Increase professors' capacity to teach relevant ICT skills (Labor Issues & Education Pillar)	LOW	HEd	<ul style="list-style-type: none"> <li>Number of hours spent by professors learning ICT skills</li> <li>Number of hours spent by professors teaching ICT courses</li> <li>Number of university students taking ICT courses</li> </ul>
(3.2.1) Implement efforts to retain ICT employees (Labor Issues & Education Pillar)	LOW	Priv	<ul style="list-style-type: none"> <li>Number of ICT companies with formal employee retention and career building programs (10 by Q4 2008)</li> <li>Annual voluntary attrition rates for ICT employees</li> </ul>
(3.2.2) Utilize the Jordan Diaspora to market Jordan to investors of Jordanian origin around the world (Labor Issues & Education Pillar)	MED	Priv	<ul style="list-style-type: none"> <li>Number of promotional events focusing in the ICT industry at Jordanian embassies (10 by Q4 2008)</li> </ul>





## Table 3. Actions

The following table lists the priority actions, along with any dependence, for each strategic outcome.

Each of these actions represents a project to be conducted by int@j or another stakeholder. Some of these projects are very broad. For some projects, we have identified sub-projects. The definition of projects will evolve over time, and the project management unit will monitor them in a project plan that it will constantly maintain. Projects are generally listed in sequential order within each outcome. The first stakeholder listed for each project will have primary responsibility for the project, with the involvement of other stakeholders listed. (int@j = Information Technology Association of Jordan; MoICT = Ministry of Information and Communications Technology; TRC = Telecommunications Regulatory Commission; JIB = Jordan Investment Board; RHC = Royal Hashemite Court; PM = Prime Ministry (also refers in this context to the Cabinet as a whole); Government = refers in this context to all Government Ministries and other entities; MoF = Ministry of Finance; MIT = Ministry of Industry and Trade; MFA = Ministry of Foreign Affairs; GAM = Greater Amman Municipality; SSC = Social Security Corporation; MoE = Ministry of Education; MoHESR = Ministry of Higher Education and Scientific Research; MoPIC = Ministry of Planning and International Cooperation; DoS = Department of Statistics; HEC = Higher Education Council; HEA & QAC = Higher Education Accreditation and Quality Assurance Council; JEI = Jordan Education Initiative; HCST = Higher Council for Science and Technology; AVC = Audio-Visual Commission; JCS = Jordan Computer Society; NCHRD = National Center for Human Resources Development; JIPA = Jordan Intellectual Property Association; JEDCO = Jordan Enterprise Development Corporation; KACE = King Abdullah II Center for Excellence.) The timeframes listed are our recommended deadlines for completion of the milestone. These are based on a combination of priority (as articulated in Table 2) and ease of implementation.

The dependencies column lists the predecessor projects along with the type of dependency, using standard project management methodology. (SF = Start-finish, or the project cannot be started until the predecessor project is finished; SS = Start-start, or the project cannot be started until the predecessor project is started; FF = Finish-finish, or the project cannot be finished until the predecessor project is finished.)

Outcomes (Pillar)	Actions (Lead Stakeholders, Other Stakeholders) (Timeframes)	Dependencies
<b>(1) Internet usage penetration of 50%</b>		
(1.1.1) Improve the effectiveness of the Telecommunications Regulatory Commission to promote a functioning competitive environment for fixed-line internet access (Connectivity Pillar)	<ul style="list-style-type: none"> <li>(1.1.1.1) Obtain ICT sector representation via one board membership on TRC (PM, TRC) (Q1 2008)</li> <li>(1.1.1.2) Ensure that TRC's mandate and operating procedures are consistent with a principle to promote market competition (PM, TRC) (Q3 2007)                             <ul style="list-style-type: none"> <li>(1.1.1.2.1) Institutionalize promotion of market competition as the prime directive of TRC (PM) (Q4 2007)</li> <li>(1.1.1.2.2) Ensure that accountability to the private sector, as well as to the government, is institutionalized in TRC's mandate (PM) (Q4 2007)</li> <li>(1.1.1.2.3) Align TRC administratively with PM (PM) (Q4 2007)</li> </ul> </li> </ul>	





Outcomes (Pillar)	Actions (Lead Stakeholders, Other Stakeholders) (Timeframes)	Dependencies
(1.1.2) Unbundle local loops effectively and fairly (Connectivity Pillar)	<ul style="list-style-type: none"> <li>(1.1.1.2.4) Ensure that TRC is independent of other non-policy-related directives (PM) (Q4 2007)</li> <li>(1.1.1.2.5) Provide identical reports to MoICT and PM (TRC) (Q4 2007)</li> <li>(1.1.1.3) Properly use 1% fee from telecommunications sector revenues to improve salaries and effectiveness of TRC (PM) (Q4 2007)</li> <li>(1.1.2.1) Launch bit-stream (Jordan Telecom) (Q3 2007)</li> <li>(1.1.2.2) Unbundle Jordan Telecom local loop (TRC) (Q2 2008)</li> <li>(1.1.2.3) Enter the market (private companies) (Q2 2008)</li> </ul>	1.1.1SF
(1.1.3) Enable sharing of infrastructure effectively and fairly (Connectivity Pillar)	<ul style="list-style-type: none"> <li>(1.1.3.1) Allow access to Jordan Telecom's and the Government's dark fiber, ducts, poles, and rights of way on a commercial basis (TRC) (Q4 2007)</li> <li>(1.1.3.2) Ease restrictions on sub-allocations of numbers (TRC) (Q4 2008)</li> </ul>	1.1.1SS
(1.1.4) Prevent anti-competitive behavior in the broadband market (Connectivity Pillar)	<ul style="list-style-type: none"> <li>(1.1.4.1) Create a competition board, with Competition Directorate representation, within TRC (TRC, MIT, private companies (licensees)) (Q3 2007)</li> <li>(1.1.4.2) Make the Competition Directorate an independent commission (PM, MIT) (Q1 2008)</li> </ul>	1.1.1SS
(1.1.5) Increase competition in the internet backbone (Connectivity Pillar)	<ul style="list-style-type: none"> <li>(1.1.5.1) Allow access to the Government's dark fiber, ducts, poles, and rights of way on a commercial basis (MoICT) (Q4 2008)</li> <li>(1.1.5.2) Spearhead initiative (RHC) (Q3 2007)</li> <li>(1.1.5.3) Enable access to terrestrial and submarine fiber landing stations (TRC, PM) (Q4 2009)</li> <li>(1.1.5.4) Enable access to electricity companies' poles/fiber/ducts (TRC, PM) (Q4 2009)</li> <li>(1.1.5.5) Invest in alternative infrastructure (JIB, private companies) (Q2 2012)</li> </ul>	1.1.1SS
(1.1.6) Establish a Universal Access/Service Fund (Connectivity Pillar)	<ul style="list-style-type: none"> <li>(1.1.6.1) Pass a clear law establishing the fund (TRC, MoICT, PM, Parliament) (Q3 2007)</li> </ul>	1.1.2SF 1.1.3SF 1.1.5SF
(1.2.1) Improve the effectiveness of the Telecommunications Regulatory Commission to promote a functioning competitive environment for wireless internet access (Connectivity Pillar)	<ul style="list-style-type: none"> <li>[See also 1.1.1]</li> </ul>	
(1.2.2) Decrease barriers to market entry for more wireless operators and technologies (Connectivity Pillar)	<ul style="list-style-type: none"> <li>(1.2.2.1) Make available more frequency under the control of the TRC (PM, TRC, Army Signal Corps) (Q4 2007)</li> <li>(1.2.2.2) Eliminate minimum bids at next auction for wireless spectrum (PM, TRC) (Q4 2007)</li> </ul>	1.2.1SS



Outcomes (Pillar)	Actions (Lead Stakeholders, Other Stakeholders) (Timeframes)	Dependencies
(1.2.3) Remove unnecessary restrictions on use of unlicensed frequencies and other technologies such as Wi-Fi in public space (Connectivity Pillar)	<ul style="list-style-type: none"> <li>(1.2.3.1) Remove restrictions (consistent with MoICT Policy (Article 51)) (TRC) (Q1 2008)</li> </ul>	1.2.1SS, 1.1.2SF, 1.2.2SF
(1.3.1) Gradually reduce sales taxes on internet access to the same level as other basic goods (Connectivity Pillar)	<ul style="list-style-type: none"> <li>(1.3.1.1) Lower tax rate (MoF, MoICT) (Q1 2008)</li> </ul>	
(1.3.2) Eliminate sales tax to lower out-of-pocket cost for PCs (Regulation & Investment Climate Pillar)	<ul style="list-style-type: none"> <li>(1.3.2.1) Conduct a study detailing revenue impacts and present a recommendation for adjusting taxation of PCs (int@j) (Q1 2008)</li> <li>(1.3.2.2) Eliminate sales tax (MoF, MoICT) (Q2 2008)</li> <li>(1.3.3.3) Study Government incentives for employers to provide subsidized PCs to their employees to use at home (MoICT) (Q2 2008)</li> </ul>	
(1.3.3) Ensure that university students have a laptop computer (Connectivity/Labor Issues & Education Pillar)	<ul style="list-style-type: none"> <li>(1.3.3.1) Develop action plan describing costs and mechanisms to provide each student with a computer (MoICT, int@j, banks, universities) (Q3 2007)</li> <li>(1.3.3.2) Implement plan (banks, universities) (Q4 2008)</li> <li>(1.3.3.3) Develop additional action plans for PC subsidies based on research into costs and benefits (private companies) (Q3 2008)</li> </ul>	
(1.4.1) Focus on the content development sub-sector (Connectivity Pillar)	<ul style="list-style-type: none"> <li>(1.4.1.1) Enter/develop market (private companies) (TBD)</li> </ul>	1.5.4SF
(1.4.2) Increase IT capacity among students and teachers (Labor Issues & Education Pillar)	<ul style="list-style-type: none"> <li>(1.4.2.1) Establish ICT-related career orientation program at secondary schools (int@j, MoE, Injaz, NetCorp) (Q4 2008)</li> <li>(1.4.2.2) Develop specific curriculum messages promoting wide use of ICT as a tool in daily life (MoE, Injaz, MoICT, NetCorps, int@j) (Q2 2009)</li> <li>(1.4.2.3) Develop specific recommended ICT tools for introduction in kindergartens (MoE, Injaz, NetCorps, int@j) (Q2 2009)</li> </ul>	1.4.3FF
(1.4.3) Improve connectivity and reliability of internet at public schools (Labor Issues & Education Pillar)	<ul style="list-style-type: none"> <li>(1.4.3.1) Study connectivity to recommend regulatory or technology improvements to improve connectivity (int@j) (Q2 2009)</li> </ul>	1.1.2SF 1.1.3SF 1.1.5SF 1.4.2FF
(1.4.4) Deliver education-related content electronically (Labor Issues & Education Pillar)	<ul style="list-style-type: none"> <li>(1.4.4.1) Implement ICT program, stressing use of ICT tools for learning, in primary and secondary schools (MoE, JEI) (Q4 2008)</li> </ul>	1.4.3FF, 1.4.6FF
(1.4.5) Increase internet usage and IT literacy through Knowledge Stations (Labor Issues & Education Pillar)	<ul style="list-style-type: none"> <li>(1.4.5.1) Develop and implement Knowledge Station strategy and action plan identifying potential service offerings, associated business models, and implementation plans (NITC/Knowledge Stations Royal Committee) (TBD)</li> </ul>	



Outcomes (Pillar)	Actions (Lead Stakeholders, Other Stakeholders) (Timeframes)	Dependencies
(1.4.6) Deploy previously piloted Jordan Education Initiative services and expand life-long learning (Labor Issues & Education Pillar)	<ul style="list-style-type: none"> <li>▪ (1.4.5.2) Provide training and capacity building to increase demand for PC and internet usage among citizens (NITC/Knowledge Stations Royal Committee) (TBD)</li> <li>▪ (1.4.5.3) Open computer rooms at schools after hours to allow community access to the internet (MoICT, MoE) (Q2 2008)                             <ul style="list-style-type: none"> <li>▪ (1.4.5.3.1) Assess requirements (MoICT, MoE) (Q4 2007)</li> <li>▪ (1.4.5.3.2) Implement (MoICT, MOE) (Q2 2008)</li> </ul> </li> <li>▪ (1.4.6.1) Accelerate the Teach training program (JEI) (Q4 2008)</li> </ul>	
(1.5.1) Increase the number of relevant government-to-business and government-to-citizen services delivered electronically (Regulation & Investment Climate Pillar)	<ul style="list-style-type: none"> <li>▪ (1.5.1.1) Improve the enabling environment for e-government (MoICT, NITC) (Q2 2008)                             <ul style="list-style-type: none"> <li>▪ (1.5.1.1.1) Continue to strengthen NITC (MoICT, NITC) (Q3 2007)</li> <li>▪ (1.5.1.1.2) Improve IT governance in the government, including interoperability standards (MoICT, NITC) (Q2 2008)</li> <li>▪ (1.5.1.1.3) Establish coordination mechanisms between the e-government program, the rest of MoICT, NITC, and MoPSD with int@j representation to prioritize e-government focus (MoICT, NITC, int@j) (Q2 2008)</li> <li>▪ (1.5.1.1.4) Implement change management programs for government personnel to speed adoption of e-government (MoICT, NITC, Government) (Q2 2008)</li> </ul> </li> <li>▪ (1.5.1.2) Implement G2B services (MoICT, NITC, Government) (Q4 2008)</li> <li>▪ (1.5.1.3) Implement G2C services (MoICT, NITC, Government) (Q4 2008)</li> </ul>	1.5.3FF
(1.5.2) Promote more attractive internet-based services (e.g., IPTV, Triple-Play) (Connectivity Pillar)	<ul style="list-style-type: none"> <li>▪ (1.5.2.1) Approve standard specifications for non-radio equipment, replacing type approval (TRC) (TBD)</li> <li>▪ (1.5.2.2) Enforce current A/V law which makes internet content not subject to regulation (PM) (TBD)</li> <li>▪ (1.5.2.3) Promote market (int@j) (Q3 2008)</li> <li>▪ (1.5.2.4) Enter market (private companies) (TBD)</li> </ul>	
(1.5.3) Reduce barriers to Jordanian companies' ability to sell services over the internet to consumers in other countries (Regulation & Investment Climate Pillar)	<ul style="list-style-type: none"> <li>▪ (1.5.3.1) Formulate and present to Parliament e-security laws, regulations, and processes (MoICT) (Q4 2008)                             <ul style="list-style-type: none"> <li>▪ (1.5.3.1.1) Implement digital signature laws and regulations (MoICT) (Q4 2008)</li> <li>▪ (1.5.3.1.2) Implement PKI processes and technology (MoICT) (Q4 2008)</li> </ul> </li> <li>▪ (1.5.3.2) Enable e-payment laws, regulations, processes, and technology (MoICT, CBJ) (Q4 2008)</li> </ul>	



Outcomes (Pillar)	Actions (Lead Stakeholders, Other Stakeholders) (Timeframes)	Dependencies
(1.5.4) Implement an internet usage code of ethics (Regulation & Investment Climate Pillar)	<ul style="list-style-type: none"> <li>(1.5.4.1) Publish an internet usage code of ethics (Higher Media Council, MoICT, int@j) (Q4 2008)</li> </ul>	
<b>(2) ICT sector revenues of \$3B</b>		
(2.1.1) Increase investment in the market for mobile-based technologies targeted at Jordan and the Arab world (Connectivity Pillar)	<ul style="list-style-type: none"> <li>(2.1.1.1) Enter market (private companies) (TBD)</li> </ul>	
(2.1.2) Increase provision of value-added services (e.g., data services) by local mobile operators (Connectivity Pillar)	<ul style="list-style-type: none"> <li>(2.1.2.1) Enter market (private companies) (TBD)</li> </ul>	
(2.1.3) Focus on the cross-sectorial, regional content generation sub-sector (Connectivity Pillar)	<ul style="list-style-type: none"> <li>[See also 1.4.1]</li> <li>(2.1.3.2) Study incentives for sub-sector (MoICT) (Q3 2008)</li> <li>(2.1.3.3) Enter market (private companies) (TBD)</li> <li>[See also 1.1.5]</li> </ul>	
(2.2.1) Increase the reliability of the internet backbone (Connectivity Pillar)		
(2.2.2) Focus on the contact center/outsourcing sub-sector (Regulation & Investment Climate Pillar)	<ul style="list-style-type: none"> <li>(2.2.2.1) Develop strategy and action plan for regulation/investment climate for the contact center/outsourcing industry (MoICT) (Q4 2007)                             <ul style="list-style-type: none"> <li>(2.2.2.1.1) Define connectivity requirements (MoICT) (Q4 2007)</li> <li>(2.2.2.1.2) Conduct market assessment (MoICT) (Q4 2007)</li> <li>(2.2.2.1.3) Define human capital/training requirements (MoICT) (Q4 2007)</li> <li>(2.2.2.1.4) Define real estate/location requirements (MoICT) (Q4 2007)</li> <li>(2.2.2.1.5) Define performance standards/SLAs (MoICT) (Q4 2007)</li> </ul> </li> <li>(2.2.2.2) Market Jordan as an outsourcing destination (int@j, JIB, MoICT, JEDCO) (Q4 2007)</li> <li>(2.2.2.3) Enter market (private companies) (TBD)</li> </ul>	1.1.2SF 1.1.3SF 1.1.5SF 2.2.1SF
(2.2.3) Increase tax exemptions applicable to contact centers/outsourcing providers (Regulation & Investment Climate Pillar)	<ul style="list-style-type: none"> <li>(2.2.3.1) Establish outsourcing as a separate industry classification within ICT (PM, MoIT, MoICT, JIB) (Q1 2008)</li> <li>(2.2.3.2) Implement MoICT recommendations to make contact center/outsourcing providers tax-exempt (PM, MoF, MoICT, int@j, JIB) (Q2 2008)</li> </ul>	2.2.4SS, 2.6.5SF
(2.2.4) Establish contact center/outsourcing industry clusters (Regulation & Investment Climate Pillar)	<ul style="list-style-type: none"> <li>(2.2.4.1) Conduct study assessing market, gathering international benchmarks, recommending an incentive package, and estimating revenue impacts (MoICT) (Q3 2008)</li> </ul>	2.2.3SS, 2.6.5SF



Outcomes (Pillar)	Actions (Lead Stakeholders, Other Stakeholders) (Timeframes)	Dependencies
(2.2.5) Focus on contact center/outsourcing jobs in vocational training centers (Labor Issues & Education Pillar)	<ul style="list-style-type: none"> <li>▪ (2.2.5.1) Enter market (private companies) (Q1 2008)</li> <li>▪ (2.2.5.2) Establish course offerings (MoL, vocational training centers) (Q4 2007)</li> </ul>	
(2.3.1) Increase use of ICT applications in key sectors (Regulation & Investment Climate Pillar)	<ul style="list-style-type: none"> <li>▪ (2.3.1.1) Promote ICT applications in vertical sectors (int@j, MoICT) (Q1 2008)                             <ul style="list-style-type: none"> <li>▪ (2.3.1.1.1) Hold periodic seminars focused on ICT in a selected vertical sector (int@j) (Q1 2008)</li> <li>▪ (2.3.1.1.2) Showcase Jordanian and regional success stories so far (int@j, JIB, JEDCO) (Q1 2008)</li> </ul> </li> <li>▪ (2.3.1.2) Enter market to focus on the use of ICT solutions to improve efficiency and quality (private companies) (Q2 2008)</li> <li>▪ (2.3.2.1) Promote applicability of standards, and ICT applications to help meet them (int@j, MoICT) (Q1 2008)                             <ul style="list-style-type: none"> <li>▪ (2.3.2.1.1) Hold periodic seminars focused on ICT in a selected vertical sector (int@j) (Q1 2008)</li> <li>▪ (2.3.2.1.2) Showcase Jordanian and regional success stories so far (int@j, JIB, JEDCO) (Q1 2008)</li> </ul> </li> <li>▪ (2.3.2.2) Enter market to focus on the use of ICT solutions to improve efficiency and quality (private companies) (Q2 2008)</li> </ul>	
(2.3.2) Promote adoption of international standards in vertical sectors (e.g., insurance, banking, government) that can be addressed by IT solutions (Regulation & Investment Climate Pillar)	<ul style="list-style-type: none"> <li>▪ (2.4.1.1) Finalize and deliver the National R&amp;D Strategy (MoICT) (Q3 2007)                             <ul style="list-style-type: none"> <li>▪ (2.4.1.1.1) Contribute to draft strategy (int@j) (Q3 2007)</li> <li>▪ (2.4.1.1.2) Formally endorse strategy when it is published (int@j) (Q4 2007)</li> </ul> </li> <li>▪ (2.4.1.2) Establish a national ICT R&amp;D committee to promote R&amp;D in the sector, provide training to industry, and promote success stories (int@j, MoICT, universities) (Q3 2008)                             <ul style="list-style-type: none"> <li>▪ (2.4.1.2.1) Develop committee strategy and charter (int@j, MoICT, universities) (Q1 2008)</li> <li>▪ (2.4.1.2.2) Secure membership from private sector, MoHE, MoICT, universities and other government entities (int@j, MoICT, universities) (Q3 2008)</li> <li>▪ (2.4.1.2.3) Hold first meeting of Council (int@j, MoICT, universities) (Q3 2008)</li> </ul> </li> <li>▪ (2.4.1.3) Establish an R&amp;D Council in the government (int@j, private companies) (Q3 2008)                             <ul style="list-style-type: none"> <li>▪ (2.4.1.3.1) Research similar international models such as the EU, US, Japan, etc. (int@j) (Q1 2008)</li> <li>▪ (2.4.1.3.2) Define high level role of council (managing the R&amp;D funds,</li> </ul> </li> </ul>	
(2.4.1) Institutionalize R&D in the culture of ICT firms (Research & Development Pillar)		



Outcomes (Pillar)	Actions (Lead Stakeholders, Other Stakeholders) (Timeframes)	Dependencies
	<p>implementation of projects, coordination of related efforts, etc., an ICT component to be established within council, private sector involvement) (int@j) (Q1 2008)</p> <ul style="list-style-type: none"> <li>▪ (2.4.1.3.3) Look into available entities that could lead that role such as the HCST (int@j) (Q1 2008)</li> <li>▪ (2.4.1.3.4) Align with key government stakeholders and present to Cabinet (int@j, MoHESR) (Q2 2008)</li> <li>▪ (2.4.1.3.5) Create Council (RHC, PM) (Q3 2008)</li> <li>▪ (2.4.1.3.6) Hold first meeting (int@j) (Q3 2008)</li> </ul> <p>▪ (2.4.1.4) Improve access to information about intellectual property and R&amp;D across the economy (JIPA, int@j) (Q2 2010)</p> <ul style="list-style-type: none"> <li>▪ (2.4.1.4.1) Consolidate available data and resources related to R&amp;D activities (e.g., projects, research activities, incubators, research centers, funding, registered patents, procedures, etc.) into a single portal that provides public access (JIPA, int@j) (Q2 2009)</li> <li>▪ (2.4.1.4.2) Ensure availability of research publications and material at universities (use Jordan universities Network as a vehicle for access), and work out mechanism for public access as well (universities) (Q2 2010)</li> </ul>	
(2.4.2) Increase venture capital funding available for small and start-up ICT development (Connectivity Pillar)	<ul style="list-style-type: none"> <li>▪ (2.4.2.1) Study market to determine available fund sources for R&amp;D (int@j) (Q1 2008)</li> </ul>	
(2.4.3) Activate the R&D Fund to fund projects in the ICT sector (Research & Development Pillar)	<ul style="list-style-type: none"> <li>▪ (2.4.3.1) Design and implement improved mechanisms to disburse funds and evaluate funded projects, with expanded role for MoICT to select ICT-related projects for a portion of the funds (int@j, MoICT, MoF) (Q4 2007)</li> <li>▪ (2.4.3.2) Start to develop national visionary ICT-focused R&amp;D projects that add value to Jordan's ICT industry (int@j, private companies) (Q4 2007)</li> <li>▪ (2.4.3.3) Start to publicize ICT-related R&amp;D success stories (int@j) (Q4 2008)</li> </ul>	
(2.4.4) Institutionalize the concepts of innovation and intellectual property in Jordanian culture (Research & Development Pillar)	<ul style="list-style-type: none"> <li>▪ (2.4.4.1) Conduct public awareness campaigns to promote concepts of (and respect for) intellectual property to general public (JIPA, RSS, National Library) (Q1 2009)</li> <li>▪ (2.4.4.2) Conduct special awareness campaigns about careers in research fields for high school students (JIPA, MoE, universities) (Q1 2009)</li> <li>▪ (2.4.4.3) Enhance understanding of intellectual property concepts within school curricula (JIPA, MoE) (Q1 2009)</li> <li>▪ (2.4.4.4) Enhance project-based learning concepts at schools and universities (MoE, universities) (Q2 2009)</li> </ul>	





Outcomes (Pillar)	Actions (Lead Stakeholders, Other Stakeholders) (Timeframes)	Dependencies
(2.4.5) Promote foreign investment in R&D in Jordan (Research & Development Pillar)	<ul style="list-style-type: none"> <li>▪ (2.4.5.1) Start to promote Jordan internationally as a country with an ICT focus (JIB, MoFA, int@j, MoICT) (Q1 2009)</li> <li>▪ (2.4.5.2) Implement cooperation agreements with international suppliers to transfer technology to Jordan (int@j, MoICT, NITC) (Q1 2010)</li> <li>▪ (2.4.5.3) Identify partnership opportunities, develop business cases, and activate projects for value-adding ICT R&amp;D projects (int@j, MoICT, NITC) (Q1 2010)</li> <li>▪ (2.4.5.4) Devise proposed incentive programs for foreign companies investing in R&amp;D in Jordan such as provision of tax incentives and favorable tax treatment to direct activities as well as to licensing generated from R&amp;D activities in Jordan (int@j, JIB) (Q1 2010)</li> <li>▪ (2.4.5.5) Steer more donor funding to ICT-related R&amp;D (MoPIC, MoICT, int@j) (Q4 2011)</li> </ul>	
(2.4.6) Ensure that the legal framework exists to promote R&D (Regulation & Investment Climate Pillar)	<ul style="list-style-type: none"> <li>▪ (2.4.6.1) Review intellectual property-/R&amp;D-related laws, regulations, and procedures (e.g., commercial, employment, investment, procurement) to ensure that they promote a friendly R&amp;D and business climate (int@j, JIPA, MoICT, MoHESR) (Q3 2008)                             <ul style="list-style-type: none"> <li>▪ (2.4.6.1.1) Gather all relevant laws, regulations, and procedures (int@j) (Q2 2008)</li> <li>▪ (2.4.6.1.2) Review materials and make recommended revisions (int@j) (Q2 2008)</li> <li>▪ (2.4.6.1.3) Advocate for revisions (int@j) (Q3 2008)</li> </ul> </li> <li>▪ (2.4.6.2) Ensure that the Labor Law protects companies' investments in R&amp;D (int@j) (Q4 2007)                             <ul style="list-style-type: none"> <li>▪ (2.4.6.2.1) Review Labor Law and MoICT draft R&amp;D Strategy (int@j) (Q4 2007)</li> <li>▪ (2.4.6.2.2) Advocate institutionalization of company ownership of company-funded R&amp;D in law (int@j) (Q4 2007)</li> </ul> </li> <li>▪ (2.4.6.3) Build capacity within the legal community on intellectual property laws (JIPA) (Q4 2010)                             <ul style="list-style-type: none"> <li>▪ (2.4.6.3.1) Develop and begin implementing a training program for the legal community (JIPA) (Q4 2010)</li> <li>▪ (2.4.6.3.2) Implement more intellectual property-related coursework in law school curricula (universities) (Q4 2010)</li> <li>▪ (2.4.6.3.3) Establish a special, temporary court to handle intellectual property-related cases until the legal system is mature enough in this area (JIPA) (Q4 2009)</li> </ul> </li> </ul>	



Outcomes (Pillar)	Actions (Lead Stakeholders, Other Stakeholders) (Timeframes)	Dependencies
(2.4.7) Improve government support of R&D (Research & Development Pillar)	<ul style="list-style-type: none"> <li>▪ (2.4.6.4) Conduct awareness sessions and special workshops about intellectual property and R&amp;D for government entities especially those responsible for government procurement and customs and IT departments (JIPA) (Q2 2009)</li> <li>▪ (2.4.6.5) Increase government incentives to conduct R&amp;D (MoF, int@j) (Q4 2011)                             <ul style="list-style-type: none"> <li>▪ (2.4.6.5.1) Make ICT R&amp;D exempt from taxes (MoF) (Q2 2010)</li> <li>▪ (2.4.6.5.2) Study potential government grants or other funding programs to promote R&amp;D (int@j) (Q4 2011)</li> </ul> </li> <li>▪ (2.4.6.6) Build an R&amp;D escrow support service for ICT-related intellectual property (int@j, private companies) (Q4 2011)</li> <li>▪ (2.4.7.1) Establish R&amp;D incubators/centers of excellence at universities (MoHESR, universities, int@j) (Q4 2011)</li> <li>▪ (2.4.7.2) Establish a government fund to encourage R&amp;D at universities (RHC, PM) (Q4 2011)</li> </ul>	
(2.4.8) Improve the academic sector's contributions to industry R&D (Research & Development Pillar)	<ul style="list-style-type: none"> <li>▪ (2.4.8.1) Increase academic research relevant to ICT industry needs (universities) (TBD)                             <ul style="list-style-type: none"> <li>▪ (2.4.8.1.1) Remove regulations preventing professors from commercializing research (MoHESR) (TBD)</li> <li>▪ (2.4.8.1.2) Study current compliance with and effectiveness of regulations allocating 5% of public university budgets for research and make recommendations to improve effectiveness (int@j) (Q2 2010)</li> <li>▪ (2.4.8.1.3) Provide incentives for universities and professors to conduct ICT-relevant research (universities) (TBD)</li> <li>▪ (2.4.8.1.4) Train professors in key R&amp;D and related skills, such as project management and marketing (TBD) (TBD)</li> </ul> </li> <li>▪ (2.4.8.2) Develop industry-relevant ICT Ph.D. programs at universities (universities) (TBD)</li> <li>▪ (2.4.8.3) Include the academic sector in national R&amp;D programs (TBD) (TBD)</li> <li>▪ (2.4.8.4) Establish R&amp;D partnerships between Jordanian universities and international universities (MoHESR) (TBD)</li> <li>▪ (2.4.8.5) Develop small funding programs and innovation awards for school projects, with possible adoption by the private sector of winning innovations (MoHESR, int@j) (TBD)</li> </ul>	
(2.5.1) Improve understanding of competitive drivers of international ICT industry to identify gaps in Jordan's competitiveness (Regulation & Investment Climate Pillar)	<ul style="list-style-type: none"> <li>▪ (2.5.1.1) Commission market study to further refine list of strategic opportunities which Jordan industry should pursue (int@j, JIB, MoPIC Competitiveness Unit, MoICT) (Q1 2009)</li> </ul>	





Outcomes (Pillar)	Actions (Lead Stakeholders, Other Stakeholders) (Timeframes)	Dependencies
(2.5.2) Promote quality certification of ICT firms (Regulation & Investment Climate Pillar)	<ul style="list-style-type: none"> <li>▪ (2.5.1.2) Improve the quality of export promotion (JEDCO, int@j) (Q4 2008)</li> <li>▪ (2.5.1.3) Focus ICT sector efforts on exports to emerging markets (int@j, JIB, private companies) (Q2 2008)</li> <li>▪ (2.5.2.1) Begin to support private companies to understand the value of quality certifications (e.g., CMMI, ITIL), obtain training, and receive certification (int@j) (Q3 2007)</li> <li>▪ (2.5.2.2) Begin to obtain quality certification (private companies) (Q4 2008)</li> </ul>	
(2.5.3) Improve business maturity of ICT firms (e.g., corporate governance, growth through merger and acquisition, marketing skills) (Regulation & Investment Climate Pillar)	<ul style="list-style-type: none"> <li>▪ (2.5.3.1) Begin to establish collaboration between ICT companies and training firms to develop and provide business skills training for ICT professionals (private companies, int@j) (Q2 2008)</li> <li>▪ (2.5.3.2) Implement specialized HR curricula, in support of ICT industry, at universities (int@j, universities) (Q3 2008)</li> <li>▪ (2.5.3.3) Add a new award category for ICT firm excellence to be given by the King Abdullah II Center of Excellence (KACE, RHC, MoICT, int@j) (Q4 2008)                             <ul style="list-style-type: none"> <li>▪ (2.5.3.3.1) Establish award category for ICT excellence (KACE) (Q2 2008)</li> <li>▪ (2.5.3.3.2) Define methodology and criteria for ICT-focused award (KACE, int@j) (Q4 2008)</li> <li>▪ (2.5.3.3.3) Begin issuing award (KACE) (Q4 2009)</li> </ul> </li> </ul>	
(2.5.4) Increase access to capital among ICT firms (Regulation & Investment Climate Pillar)	<ul style="list-style-type: none"> <li>▪ [See also 2.5.3]</li> <li>▪ (2.5.4.2) Unify existing investment bodies (JIB, JEDCO, JIEC, FZC) into a single body responsible for development, e.g., Jordan Agency for Enterprise Development (JAED), to reduce redundancy (HRC, PM, JIB, JEDCO, JIEC, FZC) (Q4 2011)</li> </ul>	
(2.6.1) Make it easier for foreign-owned business to open (Regulation & Investment Climate Pillar)	<ul style="list-style-type: none"> <li>▪ (2.6.1.1) Amend laws to remove minimum capital requirements for foreign investors (PM, MIT, GAM) (Q4 2008)</li> <li>▪ (2.6.1.2) Promote foreign investment in Jordan's ICT sector (Investment Promotion Corporation, JEDCO) (Q4 2008)</li> </ul>	
(2.6.2) Create a national credit information bureau to facilitate access to credit for entrepreneurs (Connectivity Pillar)	<ul style="list-style-type: none"> <li>▪ (2.6.2.1) Amend laws surrounding personal information to allow disclosure of relevant information (PM) (Q1 2009)</li> </ul>	
(2.6.3) Facilitate issuance of vocational licenses for incubator companies (Regulation & Investment Climate Pillar)	<ul style="list-style-type: none"> <li>▪ (2.6.3.1) Ease restrictions on capital requirements to establish a limited-liability company and be issued a vocational license (MIT, RSS, GAM) (Q1 2009)</li> </ul>	
(2.6.4) Streamline the process for closing a business (Regulation & Investment Climate Pillar)	<ul style="list-style-type: none"> <li>▪ (2.6.4.1) Create a fair bankruptcy law that reduces the time it takes to close a business (PM) (Q2 2009)</li> </ul>	



Outcomes (Pillar)	Actions (Lead Stakeholders, Other Stakeholders) (Timeframes)	Dependencies
(2.6.5) Improve industry classification to facilitate private investment and government incentives targeted to the ICT sector (Regulation & Investment Climate Pillar)	<ul style="list-style-type: none"> <li>▪ (2.6.5.1) Streamline classification of ICT industry activity, consistent with international standards, to facilitate better reporting of industry statistics, and ensure that all government organizations use the same classification system (MIT, MoF, int@j) (Q4 2008)</li> <li>▪ (2.6.5.2) Create an economic data unit within MoICT that publishes statistics on the ICT industry, to facilitate investment (MoICT) (Q1 2008)</li> </ul>	2.6.6SS
(2.6.6) Classify ICT service companies as "industry" by MoF (i.e., the 15% income tax rate) (Regulation & Investment Climate Pillar)	<ul style="list-style-type: none"> <li>▪ (2.6.6.1) Adopt a rule that ICT activity is classified as "industry" and thus subjected to the 15% tax rate (MIT, MoF) (Q1 2008)</li> </ul>	
(2.6.7) Maintain income tax exemption for exports (Regulation & Investment Climate Pillar)	<ul style="list-style-type: none"> <li>▪ (2.6.7.1) Advocate to maintain status quo (int@j) (Q3 2007)</li> </ul>	
(2.6.8) Ensure that the ICT sector continues to be represented on appropriate government boards/committees/commissions and Ministry policy-making bodies (Regulation & Investment Climate Pillar)	<ul style="list-style-type: none"> <li>▪ (2.6.8.1) Implement a formal Memorandum of Understanding between int@j and the government outlining mutual obligations and benefits (int@j, MoICT) (Q1 2008)</li> <li>▪ (2.6.8.2) Institutionalize ICTAC to formalize the relationship between int@j and MoICT (int@j, MoICT) (Q3 2007)</li> <li>▪ (2.6.8.3) Strengthen int@j's advocacy effectiveness (int@j) (Q1 2008)                             <ul style="list-style-type: none"> <li>▪ (2.6.8.3.1) Obtain advocacy training (int@j) (Q1 2008)</li> <li>▪ (2.6.8.3.2) Begin attending legal committees of parliament (int@j) (Q4 2007)</li> </ul> </li> <li>▪ (2.6.8.4) Obtain representation on AVC via one board membership for ICT sector (AVC) (Q1 2008)</li> <li>▪ (2.6.8.5) Mandate MoF and MoICT to obtain ICT sector input on draft laws (PM) (TBD)</li> </ul>	
(2.6.9) Ensure a level playing field in government procurement laws and processes to give qualified local firms an opportunity to compete (Research & Development Pillar)	<ul style="list-style-type: none"> <li>▪ (2.6.9.1) Increase requirements for Jordanian firm participation in Government procurements (Government) (Q4 2007)</li> <li>▪ (2.6.9.2) Study Government procurement laws, regulations, and practices and provide analysis/position paper noting inconsistencies and incorrect applications that should be remedied (int@j) (Q2 2008)</li> <li>▪ (2.6.9.3) Allow binding arbitration as an option in Government contracts (PM, Government) (Q2 2008)</li> </ul>	
(2.6.10) Clarify roles to ensure that government organizations do not compete with the private ICT sector (Regulation & Investment Climate Pillar)	<ul style="list-style-type: none"> <li>▪ (2.6.10.1) Develop position paper recommending protocols, based on international best practices, for activity that government organizations should not conduct (int@j, RSS, NITC, MoICT) (Q4 2008)</li> <li>▪ (2.6.10.2) Adopt protocols (PM, RSS, NITC) (Q4 2010)</li> </ul>	



Outcomes (Pillar)	Actions (Lead Stakeholders, Other Stakeholders) (Timeframes)	Dependencies
<p>(2.7.1) Increase awareness of the potential for IT-driven innovation and R&amp;D among companies across the economy (Research &amp; Development Pillar)</p> <p>(2.7.2) Increase linkages between int@j and other business associations and the Jordan Computer Society to promote IT diffusion in industry (Labor Issues &amp; Education Pillar)</p>	<ul style="list-style-type: none"> <li>▪ [See also 2.3.1]</li> <li>▪ (2.7.1.2) Develop a library of global best practices and domestic success stories surrounding ICT (int@j) (Q1 2010)</li> <li>▪ (2.7.1.3) Present best practices and success stories in vendor/customer forums (int@j) (Q1 2010)</li> <li>▪ (2.7.2.1) Develop a joint action plan with JCS to increase opportunities available to ICT professionals and meet with ICT industry's resource needs (int@j, JCS) (Q2 2008)</li> </ul>	
<b>(3) ICT sector jobs of 35,000</b>		
<p>(3.1.1) Study historical labor market outcomes for ICT graduates to define gaps between supply and industry demand (Labor Issues &amp; Education Pillar)</p> <p>(3.1.2) Encourage incubators and other types of internships in the ICT industry for university students (Labor Issues &amp; Education Pillar)</p> <p>(3.1.3) Add more ICT-related coursework (technical and non-technical) to university curricula (Labor Issues &amp; Education Pillar)</p>	<ul style="list-style-type: none"> <li>▪ (3.1.1.1) Conduct study on historical labor market outcomes for ICT graduates (int@j, Injaz, SSC, DoS, MoHESR, universities, NITC) (Q4 2007)                             <ul style="list-style-type: none"> <li>▪ (3.1.1.1.1) Define data needs (based on data availability) and study structure (int@j, DoS, SSC, universities) (Q3 2007)</li> <li>▪ (3.1.1.1.2) Provide longitudinal data on employment in ICT firms (SSC) (Q3 2007)</li> <li>▪ (3.1.1.1.3) Provide data on ICT graduates (universities) (Q3 2007)</li> <li>▪ (3.1.1.1.4) Conduct and publish study (int@j, DoS) (Q4 2007)</li> </ul> </li> <li>▪ (3.1.1.2) Build and maintain database in ICT graduates working in the Government and private industry (NITC) (Q2 2008)</li> <li>▪ (3.1.2.1) Identify and promote six-month industry internships and other coordination programs between industry and universities (int@j, private companies, universities) (Q1 2008)</li> <li>▪ (3.1.2.2) Promote ICT-focused internships in the Government (NITC) (Q2 2008)</li> <li>▪ [See also 2.5.3]</li> <li>▪ (3.1.3.2) Increase formal collaboration between universities and the ICT industry (MoHESR, universities, int@j) (Q1 2009)                             <ul style="list-style-type: none"> <li>▪ (3.1.3.2.1) Create working groups between industry, universities, and public sector to define collaboration parameters (int@j) (Q3 2007)</li> <li>▪ (3.1.3.2.2) Add industry representation to public university boards (int@j, MoHESR, universities) (Q1 2009)</li> <li>▪ (3.1.3.2.3) Add industry representation to private university boards (universities) (Q1 2009)</li> </ul> </li> <li>▪ (3.1.3.2.4) Create space for int@j representative on Higher Education Council (RHC, HEC) (Q3 2007)</li> </ul>	



Outcomes (Pillar)	Actions (Lead Stakeholders, Other Stakeholders) (Timeframes)	Dependencies
(3.1.4) Incentivize universities and professors to prepare graduates for jobs in ICT (Labor Issues & Education Pillar)	<ul style="list-style-type: none"> <li>▪ (3.1.3.2.5) Create space for int@j on the Higher Education Accreditation and Quality Assurance Council (RHC, HEA &amp; QAC) (Q3 2007)</li> <li>▪ (3.1.3.2.6) Create an associate member category for universities in int@j (int@j) (Q3 2007)</li> <li>▪ (3.1.3.3) Involve the private sector in university curriculum design (int@j, universities, MoHESR) (Q4 2009)                             <ul style="list-style-type: none"> <li>▪ (3.1.3.3.1) Define mechanism for industry to participate in curriculum development (int@j) (Q1 2008)</li> <li>▪ (3.1.3.3.2) Study options to provide more ICT coursework in curricula (int@j, universities) (Q1 2009)</li> <li>▪ (3.1.3.3.3) Develop ICT curricula (int@j, universities) (Q4 2009)</li> <li>▪ (3.1.3.3.4) Implement ICT curricula (universities) (Q4 2009)</li> </ul> </li> <li>▪ (3.1.3.4) Increase the use of ICT professionals in the classroom, e.g., as adjunct professors and guest lecturers (universities, int@j) (Q4 2009)</li> <li>▪ (3.1.4.1) Promote joint graduation projects between industry and universities (int@j, private companies universities) (Q4 2009)</li> <li>▪ (3.1.4.2) Change regulations to allow professors to work outside of universities (MoHESR) (Q4 2009)</li> <li>▪ (3.1.4.3) Encourage private-sector role in the classroom (universities, private companies) (Q1 2008)</li> </ul>	
(3.1.5) Provide better job-search tools for universities and their graduates to use (Labor Issues & Education Pillar)	<ul style="list-style-type: none"> <li>▪ (3.1.5.1) Implement electronic employment tools and solicit input from the ICT sector (universities, private companies) (Q4 2009)                             <ul style="list-style-type: none"> <li>▪ (3.1.5.1.1) Facilitate job searches of ICT graduates using existing tools, including NCHRD and IT.JO website (universities) (Q1 2009)</li> <li>▪ (3.1.5.1.2) Design new job-search tools (private companies, universities) (Q4 2009)</li> </ul> </li> <li>▪ (3.1.5.2) Publish statistics on the ICT sector job market (int@j) (Q3 2008)</li> </ul>	
(3.1.6) Increase professors' capacity to teach relevant ICT skills (Labor Issues & Education Pillar)	<ul style="list-style-type: none"> <li>▪ [See also 2.4.8]</li> <li>▪ [See also 3.1.3]</li> <li>▪ (3.1.6.3) Develop long-term strategy to improve ICT capacity among university professors (int@j, universities) (Q4 2009)</li> </ul>	3.1.3SF
(3.2.1) Implement efforts to retain ICT employees (Labor Issues & Education Pillar)	<ul style="list-style-type: none"> <li>▪ (3.2.1.1) Document professional career standards for the ICT sector (universities) (Q4 2008)</li> <li>▪ (3.2.1.2) Develop employee retention and career building programs (private companies) (Q4 2008)</li> <li>▪ (3.2.1.3) Study possibilities for government incentives (e.g., student loans that</li> </ul>	



Outcomes (Pillar)	Actions (Lead Stakeholders, Other Stakeholders) (Timeframes)	Dependencies
<p>(3.2.2) Utilize the Jordan Diaspora to market Jordan to investors of Jordanian origin around the world (Labor Issues &amp; Education Pillar)</p>	<p>are waived if the graduate stays in Jordan) for ICT professionals to stay in Jordan (int@j) (Q4 2009)</p> <ul style="list-style-type: none"> <li>▪ (3.2.2.1) Implement networking web site focused on Jordanian ICT professionals world-wide and providing information about domestic sector activities (Int@j) (Q1 2009)</li> <li>▪ (3.2.2.2) Hold an annual conference for the Jordanian Diaspora, showcasing the local ICT industry to Jordanians who return (int@j) (Q1 2008)</li> <li>▪ (3.2.2.3) Hold promotional events focusing on the Jordan ICT industry at Jordanian embassies (int@j, JIB, MoFA) (Q1 2009)                             <ul style="list-style-type: none"> <li>▪ (3.2.2.3.1) Define mechanism and funding requirements (int@j, JIB) (Q3 2008)</li> <li>▪ (3.2.2.3.2) Schedule events (MoFA) (Q4 2008)</li> <li>▪ (3.2.2.3.3) Hold events (MoFA) (Q1 2009)</li> </ul> </li> <li>▪ (3.2.2.4) Implement a "Jordanian Ambassadors" program to equip influential Jordanians residing abroad with the necessary knowledge and support to effectively represent the Jordan ICT industry among their peers (int@j, JIB) (Q4 2008)</li> </ul>	



## Conclusion

In order to realize the benefits promised by Information and Communications Technology, Jordan's public and private sector must work closely together. Maximizing the ability of this sector to contribute to Jordan's economy will require a disciplined approach and proactive work towards advancing all areas of the sector. Neither group has the luxury of waiting on the other to overcome the barriers that currently impeded success in this arena. The public sector and the private sector must become true partners working toward a common goal if Jordan is to truly benefit from ICT.

Improving both the availability and cost of connectivity is a key foundation. Without adequate bandwidth and affordable access, the average Jordanian will be left behind and the digital divide in Jordan will grow ever larger. The actions within the Connectivity pillar provide several key interim steps that will help achieve the overall strategic goals relating to internet penetration, job creation, and sector growth. This foundation is vital to enable gains in the other Pillars.

Jordan's existing approach to research & development has been scattered and less effective than it needs to be to foster a world-class industry. In order to breed sustainable development in ICT for Jordan, a vibrant R&D program is necessary. To date, new products and services have been limited in scope and effectiveness. Overcoming the existing barriers will help private enterprise in Jordan expand beyond its current horizons. The goal is to refocus R&D from a research for the sake of research approach to a focus on R&D culminating in commercially-viable products and services. Again, to achieve this, partnerships between the public sector, private sector, and universities must be established. Each of these entities should be working in lockstep. Rather than incremental improvement, a vibrant and active R&D program can lead to innovative and transformational developments placing Jordan in the forefront of ICT in the region and, potentially, in the world.

Jordan faces significant obstacles to creating a world-class ICT workforce. Among them is the lack of market-focus of university programs. Universities are faced with skyrocketing enrollment in ICT programs, a lack of funding, and a lack of collaborative programs with industry. As a result, the private sector faces significant training and development of graduates before they are able to contribute to the sector. In addition to technical deficiencies, graduates are uncertain in the work environment and must be trained employees on how to be professional members of the corporate team. The availability of financially attractive opportunities elsewhere in the region causes a "brain drain" effect. The best and brightest of Jordan's graduates are being siphoned off to other nations. This strategy recommends strategic activities to use this "brain drain" to Jordan's gain by soliciting repatriation of Jordan's business and ICT expertise and resources abroad to market internet-based products and services of Jordan's ICT sector. In addition, the strategy sets goals help make remaining in Jordan a more attractive option by raising the level of professional development undertaken by companies within the ICT sector. Using innovative approaches and building the skills of the ICT sector in general, Jordan can overcome the roadblocks currently in place that slows the growth desired from the ICT sector.

Jordan's regulation and investment climate has failed to improve as radically as is needed to make Jordan a destination for investment. While Jordan's regulations are fairly advanced, enforcement of those regulations is inconsistent and capricious. Businesses do not feel secure that their intellectual property will be protected making external investors leery of the market. In addition, the bureaucratic hurdles to managing the business life-cycle present a barrier to investment and business start-ups. Finally, Jordan needs to strengthen the role of the TRC. Currently, rather than proactively enforcing policies approved by the Cabinet, policies are being created and enforced according to the judgment of the employee. This may or may not comply with existing policy, based on how agreeable the policy seems to be in the eye of the TRC employee. However, this situation does not allow for an understanding of the entire picture of the industry, the country's goals, and consistency in approach. All of these combine to make Jordan less attractive for ICT investment dollars.

By bringing together the best minds in the country to work through these challenges, int@j has adopted a strategy that will allow Jordan to capitalize on its ICT sector. Each dollar invested will bring significantly



greater return. Seeking innovative solutions and transformational approaches to the challenges facing ICT in Jordan will lead to unique solutions tailored to this country and its needs. This approach will ensure that Jordan continues to move forward rather than stagnating.





## Appendix 1. Current State Analysis by Pillar

### Connectivity Pillar

Overall, physical resources and infrastructure are reasonably well developed in Jordan. Jordan ranks above average for all countries and well above regional benchmarks. However, telephone fault rates are still at average levels. Jordan lags in recovery time from the faults, causing disruptions to consumer service. With more than 600,000 estimated Internet users (10.7% penetration)<sup>7</sup>, nearly 4 million mobile users (69% penetration by mid-2006)<sup>8</sup>, and an infrastructure capable of even greater capacity, Jordan is in a solid position to capitalize on its ICT infrastructure. According to Jordan Telecom, broadband internet infrastructure is available at the local office level to support more than 99% of homes in Jordan. While broadband penetration is growing rapidly (doubling in recent years), the actual penetration rate is still low. The growth is expected to rise upon completion of initiatives aimed at improving affordability for each household to have a PC and a broadband connection.<sup>9</sup> There is still work that needs to be done to ensure that connectivity options and availability support the overall strategy.

Although fixed-line access is available to the majority of Jordanians, access availability does not lead to subscriptions. In order to increase subscriptions rates, users must perceive a higher value of access relative to the cost to encourage them to enter the market. Currently, the cost of internet access (broadband and dialup) is up to ten times higher than other developed economies on a relative basis when national income is taken into account. The cost of PCs is also very high relative to income. In the e-Readiness Assessment Survey, 89% of the respondents identified high PC and Internet prices as the biggest barrier to Internet penetration. These two factors combine to keep Jordan's current Internet penetration (10.7%) at rates significantly lower than those of European countries, which average rates of 45%.

In addition to the cost issue, the entry-level broadband offerings in Jordan provide only 128k download speed. This rate will soon not meet global broadband standards. When broadband is referenced in this report, unless otherwise specified it refers to download speeds of at least 1M and upload speeds of at least 128k.<sup>10</sup> In-home broadband penetration at all speeds in Jordan is very low at only 0.74%<sup>11</sup>, even with strides being made through the National Broadband Network. Broadband offers the ability to deliver an "always on" internet connection at higher speeds for both upload and download than traditional dial-up access. The government in Jordan has been working to improve the ability of the citizens of Jordan to access the Internet, setting the stage for better capitalization on the promises of the ICT sector. However, to ensure that such emerging technologies as broadband are available and affordable, a strong regulatory posture ensuring competition, investment, and innovation is required. Under the National Broadband Network initiative, the broadband network linking universities is being implemented while the school network is in the planning stages. Although businesses are relying more heavily on broadband technologies to stay connected to company operations, suppliers, customers and employees, adoption rates remain low in relation to the overall population. Moving forward, broadband availability will continue to be an important factor in the location decisions made by companies. Also, the ability to leverage features allowed by broadband including real-time video and audio, voice-over IP, video conferencing, rapid data downloads, and cable, may spur significant increases in adoption rates.<sup>12</sup>

Infrastructure deficits like those that exist in providing wireline connectivity to end users who require new last-mile connections to be delivered may be overcome using wireless broadband technology. Challenges similar to those facing Jordan are present in many developing markets in Eastern Europe and China, India, and Latin America. One solution commonly being deployed in these areas is Wireless Broadband (WiMax). This technology enables the infrastructure barriers to be eliminated more quickly and at lower cost.

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<sup>7</sup> e-Readiness Assessment, p. 27

<sup>8</sup> Numbers courtesy of Arab Advisors

<sup>9</sup> Dravis, Paul, et.al. ICT Investment & Trade Promotion Strategy, March 2005, p. 16

<sup>10</sup> Beckett, Ian. Jordan ICT Sector Strategy, February 2006, p.9

<sup>11</sup> Numbers courtesy of Arab Advisors

<sup>12</sup> Investment & Trade Promotion Strategy, p.17



However, the current entry cost of spectrum, at 5 million JD, is considered by quite a few parties in Jordan to be significant enough to hinder low prices in the Jordan market. Typical benefits of WiMax include:

- Lower cost of infrastructure than landlines.
- Shorter time of deployment (3 to 6 months).
- Necessary level of competition to drive broadband pricing to international levels promoted.
- Licensing opportunities enable an independent telecoms Regulator to set service and price conditions.
- Similar technology and infrastructure to cellular, in many cases allowing the base stations to be co-located on cellular masts, which accelerates deployment.
- Penetration objectives of up to 20% could be achieved within 2 years in Jordan.<sup>13</sup>

Understanding the current cost structures in place for internet access and PCs is one key to drive higher adoption rates. It is possible that the costing and price structures which are in place today are based on the revenue generation objectives implemented under the current Government regulatory framework. This is a central barrier to ICT sector growth: the establishment of a strong independent regulator should facilitate the dismantling of the current framework, if it is indeed a barrier to cost reductions. Such a move would only be effective, however, if the Jordan Telecommunications Regulatory Commission (TRC) takes an active role in allocating scarce resources (spectrum) rather than a passive brokerage role as at present which enables users of spectrum to impose uneconomic pricing and timelines to vacate occupied spectrum. In addition, a strong independent regulator will be able to assess service delivery costs and establish fair market prices. It will also identify those holding monopolies as having a significant market presence and generally adopt an aggressive position if their costs are due to uncompetitive practices or inefficiency.<sup>14</sup>

An overall successful growth strategy must embrace both cost reduction and usage penetration. Where costs are reduced to relative international levels, the immediate impact will be to increase time on line of existing users and increase internet use by an estimated 2% to 9%. This would have significant benefits as Internet use drives education and economic activity—but would be a short-term gain without a penetration strategy to provide connectivity for a high percentage of the population. The evidence from developed markets shows that spending on ISP access alone, which introduced low cost tariffs typically, remained static while usage increased. The constraint to internet usage growth is seen to be infrastructural. The availability and distribution of landlines and broadband access are the limiting factors to penetration.<sup>15</sup>

Increased competition, as well as vigilant monitoring by the TRC, will continue to drive prices down. Average telecom prices today are 25% of what they were in 2000, and they continue to drop. In the wireless market, four operators compete to provide infrastructure and services that have driven prices down and increased wireless penetration rates (which reached 70% in June 2006). The expiration of the fixed line monopoly that took place at the end of 2004 is expected to open the door for competition in this sub-sector and encourage the development and introduction of new services while reducing international voice and data costs. According to Jordan's Investment and Trade Promotion Strategy, this "development should be key in determining whether the desire to cultivate the call center industry in Jordan will kick-off or not. A study commissioned by the Ministry of Planning has concluded that despite Jordan's large pool of English-speaking, educated and low-cost work-force, the telecom costs were such that Jordan was rendered less competitive in this domain."<sup>16</sup>

## **Awareness of Cross-Cutting Opportunities in Digital Media**

Digital Media are products and services through which skilled individuals and professional companies create valued content for their clients with the help of information technologies. These products and services have

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<sup>13</sup> ICT Sector Strategy, pp. 13-14

<sup>14</sup> ICT Sector Strategy, p. 9

<sup>15</sup> ICT Sector Strategy, p. 13

<sup>16</sup> Investment and Trade Promotion Strategy, p. 17



application in a variety of areas such as education/learning, entertainment, communication, as well as parochial IT products and services which focus on improving process efficiencies, data/knowledge management, and decision support.

Digital media can increasingly integrate various creative inputs such as:

- Audio (music, narration, sound effects)
- Graphics
- Video (film/video, 2D and 3D animation)
- Text (creative writing and storytelling, instructions, news, etc.)
- Data
- Interactivity
- Gaming
- Computer programming.

As such, digital media is well placed to integrate the various creative forces within a society, create value with these creative forces, develop products and services with it and distribute these products and services through a variety of channels such as:

- Television
- Radio
- Internet
- Mobile devices (phones/PDAs/etc.)

Digital media is easily communicable across different media, making it an ideal product or service with multiple distribution options potentially for all global markets. The communicability of digital media has implication regarding the types of products which can be developed. Products include entertainment (music, music video, mobile games, video games, video clips, and cartoons) as well as education and communication.

The global market for digital media can still be considered in its infancy. The U.S. continues to be the largest digital media market with annual sales of USD 523 billion.<sup>17</sup> The Asia Pacific digital media market is USD 366 billion.<sup>18</sup> The global online music market grew 134% in 2005 and was expected to reach sales of USD 1 billion.<sup>19</sup> Booz Allen Hamilton believes that global mobile data services will increase to USD 92 billion by 2007. Alexander Resources projects that the global mobile gaming market will have grown from USD 500 million in 2002 to reach USD 2 billion in 2006.<sup>20</sup>

The media and telecommunication landscape in the Arab world is massive. The 300 million Arabs across 22 Arab countries are served by<sup>21</sup>:

- 41 mobile telephony operators (and growing)
- 23 fixed telephone operators
- 36 data communication operators (and growing)
- Over 300 ISPs (and growing)
- Over 100 satellite channels
- Over 90 FM radio stations (and growing)

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<sup>17</sup> Singapore Economic Development Board; <http://www.edb.gov.sg>

<sup>18</sup> *Ibid.*

<sup>19</sup> <http://www.dmeurope.com/default.asp?ArticleID=7350>

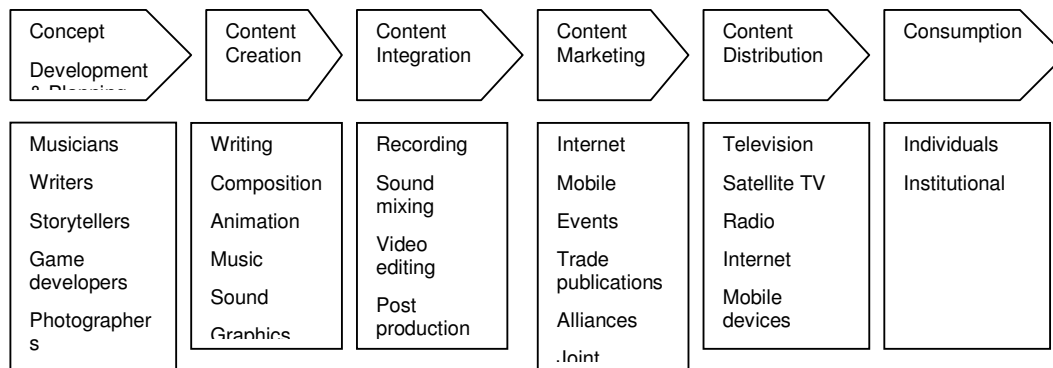
<sup>20</sup> <http://www.onlinereporter.com>

<sup>21</sup> <http://www.ameinfo.com/cgi-bin/cms>

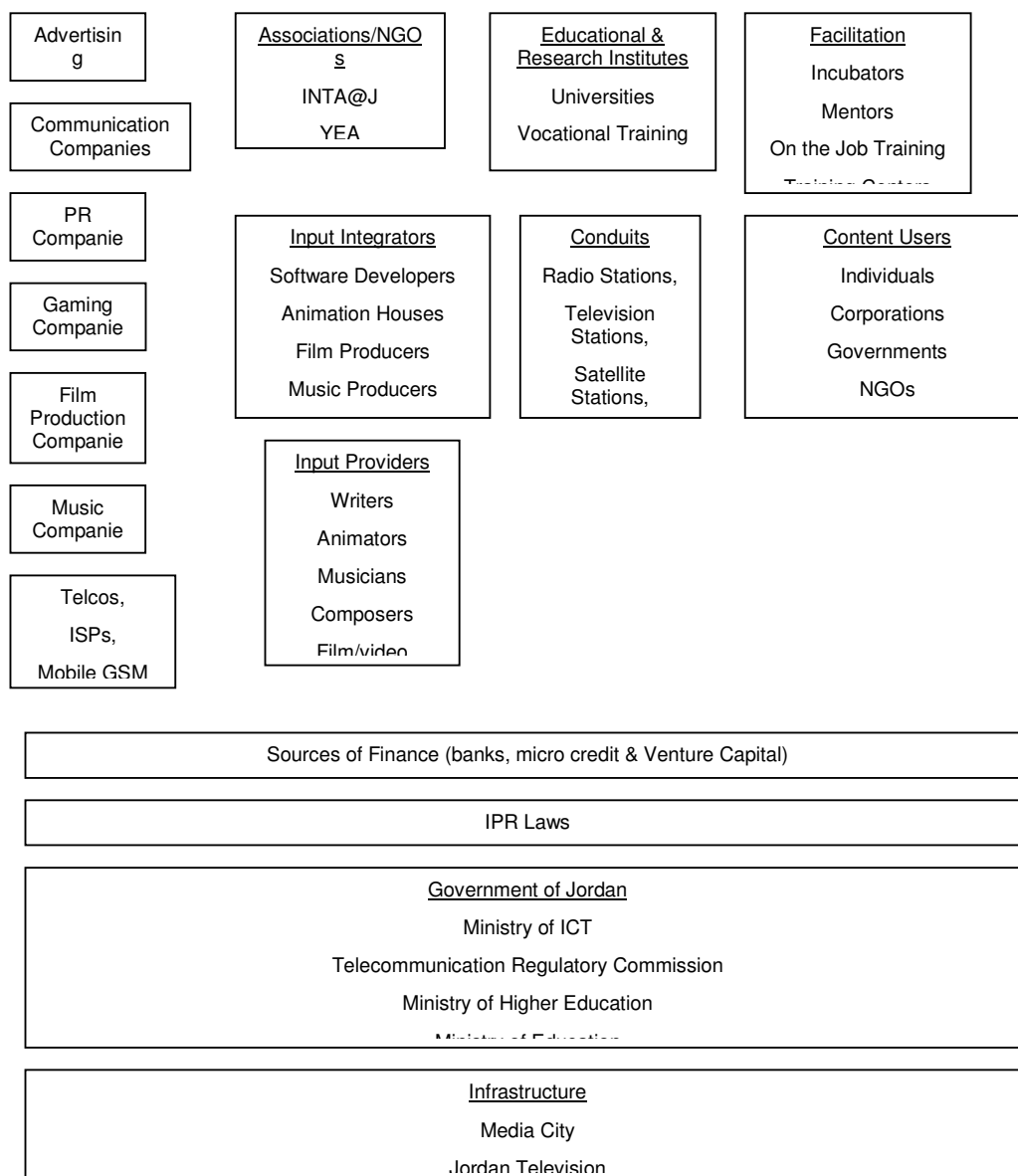


Thus, the regional Arab market represents a vast opportunity for the creation and distribution of digital media content. In the short- to medium-term, this initial content can be Arabic language-specific. Over the long-term, the same integration of skill sets and capabilities required by digital media can be used to develop content for global markets. With digital media, content can be sold directly to the end user or through an intermediary.

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



Based on the above, the following digital media cluster map describes the different players.



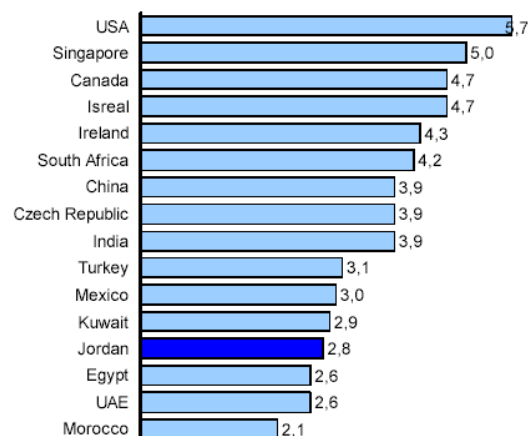
Jordan faces many challenges to transition the IT sector from its current parochial definition to an IT sector which is capable of fully exploiting digital media opportunities. However, doing so will increase both internet penetration—by providing Jordanian consumers with more compelling reasons to want to use the internet—and ICT sector revenues.

## Research & Development Pillar

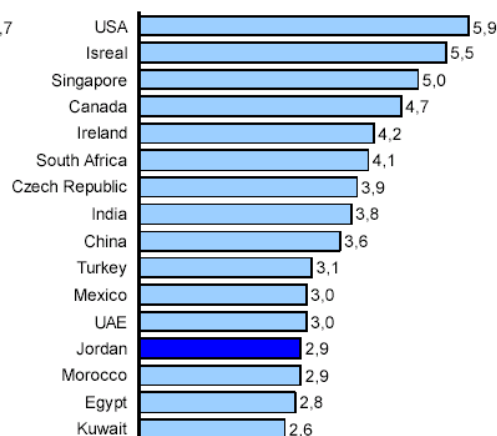
In order to make the explosive strides necessary to make ICT a significant player in Jordan's economy, Research and Development must play an integral role. To date, Research and Development activities have been severely underrepresented. R&D efforts have been extremely limited and concentrated in a select few IT firms. Although Jordan has the appropriate raw materials—relatively high numbers of scientists and engineers—industry/academia cooperation enabling breakthroughs in ICT is low. In addition, private industry's spending on R&D is low:



## University/Industry Research Collaboration



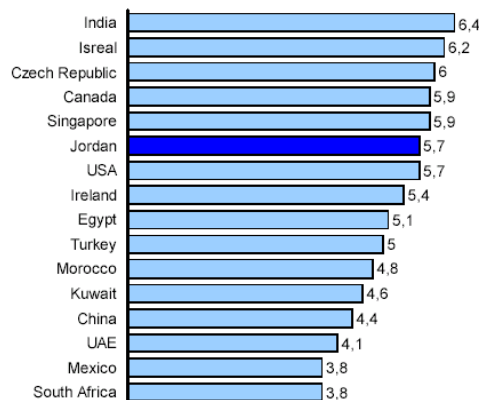
## Company Spending on R&D



Source: Global Competitiveness Index

Researchers in R&D (per million people)					
	1999	2000	2001	2002	CAGR
Singapore	3211	4140	4086	4353	11%
Canada	3250	3535	3709	3597	3%
Ireland	2101	2240	2316	2386	4%
Czech Republic	1317	1349	1461	1461	4%
Morocco	860	846	869	782	-3%
China	420	546	579	627	14%
Turkey	299	338	328	341	5%
Mexico	222		254	268	7%
Jordan		180	190	194	3%
Kuwait	89	81	74	69	-8%

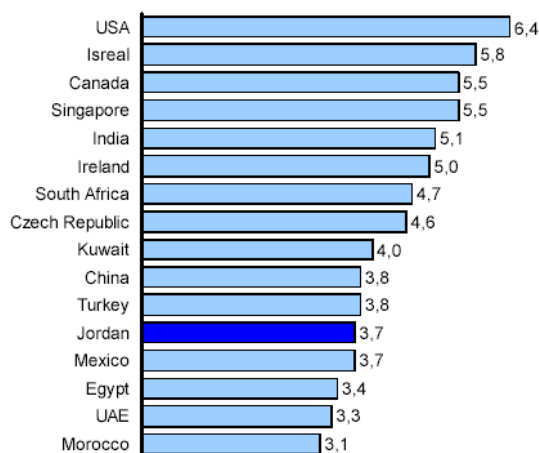
## Availability of Scientists and Engineers



Source: PRG Analysis based on World Development indicators, Royal Scientific Society, Country Ministry Web Sites, Global Competitiveness Index



## Quality of Scientific Research Institutions



Source: Global Competitiveness Index

Although Jordan has adequate numbers of higher educational institutions, 10 public and 15 private, limited R&D is occurring at these institutions. The existing University regulations fail to incent professors to drive R&D activities that meet market needs. In addition, market industry needs and academia priorities are not aligned. Currently, very few coordination efforts exist for communication between universities and with industry. In addition, while the National Broadband Network and the Jordan Universities Network Company (JuNet) have been established to further interaction among Universities, limited utilization for this purpose is evident to date. Also, there is inadequate availability of information that would be applicable to R&D and intellectual property. The information that is available is not consolidated and easy to access.

Although the number of skilled potential R&D participants is appropriate, an infrastructure does not exist to support development of skills and qualifications specific to R&D. This is true for both University professors and students. Currently the focus is on developing technical skills around mainstream building blocks, including Microsoft and Oracle, rather than cutting-edge technologies like artificial intelligence, pattern recognition, and encryption. Also, development priorities for technical skills are driven by immediate marketability, favoring existing rather than development technology.<sup>22</sup>

Another factor hindering focus on R&D in the private sector is the situation of intellectual property– and R&D-related laws and regulations. Conflicts exist between the related laws and regulations and their actual implementation procedures causing issues in the development of intellectual property. Also, enforcement of the existing laws has been weak, creating an issue for both local and international investors. The procedures for obtaining patents and intellectual property and copyright registration need to be more closely aligned with market needs. There is a widespread lack of awareness regarding intellectual property matters among businesses and the public, creating a lack of expertise and legal specialization to assist organizations and entities in protecting their investments.

The government of Jordan does not currently provide adequate incentives to companies to place a focus on R&D. Private-sector companies pursue R&D based on current marketability. In other markets, where tax breaks have been offered as an incentive to encourage R&D, five-fold increases have been experienced. In addition, government entities demonstrate skepticism regarding local products, favoring internationally available products. In order for ICT firms to succeed and grow into export markets, the government must lead by example. Procurement laws need to be overhauled to place a focus on encouraging local R&D, placing emphasis on local-value added solutions rather than hardware or software resale costs. Finally, the government often requires the source code for applications without making allowances for related support services, including escrow, which is not currently available in Jordan.

<sup>22</sup> Investment and Trade Promotion Strategy, p.19





Funding for R&D activities is already being collected through a 1% tax on all public shareholding companies. The ownership and usage of this fund is currently unclear. The details of the fund and its methods for application are also not clear. This fund would be considered as one of the options to fund initiatives around improving the rates of R&D. Another option to funding would be to encourage more focus of Foreign Direct Investment in ICT R&D and innovation.

Although a number of initiatives have been undertaken, many of which were sponsored by foreign entities, their positive impact on R&D has been very limited. The initiatives that could have a beneficial impact on R&D, if utilized properly, include the SUN Incubator, the ILab, the Yarmouk Center of Excellence, and Microsoft's Innovation Centers (e.g., MS School Technology Innovation Center, MS Public Sector Innovation Center, MS Business Solutions Academy), among others. The lack of utilization of these entities to forward R&D gains both impedes overall R&D activities and discourages future investment in R&D.

There are a number of institutions that may play a role in moving R&D forward in Jordan. To date, however, these institutions have failed to take the necessary leadership role or make significant changes desired to move Jordan's R&D efforts. The Ministry of Higher Education and Scientific Research (MoHESR) is Jordan's official research policy body, but has been too focused on universities rather than encompassing country-wide cross-body coordination. The Higher Council for Science and Technology (HCST) has the charge of putting developing Science and Technology policies but limited ability to enforce them. HCST activities include the development of the human resources related to R&D, centers of excellence and research networks, and financial support of R&D projects. Through programs such as the iPark it supports entrepreneurship and innovation through business incubation. In addition, the Royal Scientific Society (RSS), which was established as an applied research institution, is now focused on providing technical services rather than providing leadership in innovation. Although it is a non-profit, quasi-governmental entity, it competes directly with the private sector on contracts raising conflict of interest issues. Another potentially beneficial institution is the Jordan Intellectual Property Association (JIPA). This not-for-profit voluntary membership association aims to contribute to positive economic growth in Jordan through increased levels of awareness of intellectual property in the Jordanian business community, enhanced infrastructure for intellectual property rights protection, and an internationally recognized intellectual property industry in Jordan.



## Labor Issues & Education Pillar

Labor issues and education are vitally important to the ICT sector. This sector leverages human capital in a manner that few other sectors do and is ideally suited to Jordan. However, in order to maximize the benefit promised by the ICT sector, Jordan must ensure that labor and education do not become barriers rather than gateways to ICT adoption.

Although Jordan is in the enviable position of have a young and qualified workforce, there are significant gaps between the skill sets observed in graduates and those needed in the market. These gaps are partially due to outdated curricula not keeping pace with advancements in the field. The gaps also arise from a lack of industry focus in the curricula. Included among the topics greatly needed in the market but underserved in the universities are project management, general business skills, and "soft skills." The lack of a single strategy to strengthen governance and drive sector development has hampered resolution of these challenges. The orientation of current programs toward academic learning rather than technical or vocational education is placing a tremendous burden on public universities. In addition, to the observed skill gaps, Jordan suffers from the export of its qualified labor supply to countries in the region which are able to offer more attractive compensation packages. This "brain drain" impacts the quality and quantity of specialized labor available in the market. Simultaneously, Jordanians are sought after in the workforce abroad. As a result, these skills are considered an export category for Jordan. Those Jordanians living abroad can bring value to the country in general and the ICT sector in particular if they are encouraged to play the role of ambassador for products and services from Jordan. They may also use Jordanian sector services to support their business abroad rather than local ones, bringing more revenue and support to Jordan.

Based upon the focused leadership of His Majesty King Abdullah II, human capital overall is receiving appropriate attention. Many of Jordan's on-going initiatives are targeted at developing the human capital, particularly the future labor force as represented by the students and youth. Jordan leads the region in its spending on education and competes throughout the world with its enrollment numbers. Free public education is universally available. However, the quality of education has not necessarily lived up to the leadership role Jordan is poised to take. As observed in the National Agenda, those sectors concerned with the current and future labor force lack effective mechanisms to coordinate human resource development policies and to monitor and evaluate the quality of educational and training programs. Numerous entities set policies and monitor implementation program levels with no coordination mechanism available to ensure cohesiveness and applicability of their policies and strategies. For its non-student workforce, public and private entities have cooperated to enhance skill levels through training in ICT and the capabilities required for success. However, these efforts have not been focused leaving skill gaps in evidence even among the more experienced workforce.

While Jordan has aggressively sought solutions to its challenges in connectivity and affordability, the National Broadband Network and Knowledge Stations have failed to drive internet, broadband, or PC penetration to desired levels. Locally relevant content and e-Government services have not progressed quickly enough to spur desired new adoption rates. As a result, Jordan's e-literacy has not yet matured.

Solving the outstanding barriers to the ICT arena will leverage this human capital intensive sector to move Jordan in a leadership position utilizing its most plentiful resource, people. Improving the skills and availability of the labor force and fostering better alignment between industry needs and educational output will clear significant barriers to success.



## Regulation & Investment Climate Pillar

Investors make location and expansion decisions based upon many factors that may help them achieve their corporate objectives. These factors form a set of criteria that assist investors in deciding whether to invest, enter a market, or select an alternative option. Some of the criteria which potential investors in the ICT area take into account include market potential, value proposition (specialized and differentiated products and services), human resource quality and availability, legal and regulatory environment, infrastructure cost and reliability, taxation schema, profit repatriation, ease of registration and licensing, investment liquidity and ease of exit from the market, country stability, private sector support, and public sector support. These criteria combine to make a potential investment more or less attractive. The regulation and investment pillar is responsible for developing a strategy that will attract new investments to Jordan. This pillar focuses on needed updates to existing regulations, new laws and regulations required, and the privatization/liberalization mix needed.

The following table provides the results of the latest e-Readiness Assessment of the Hashemite Kingdom of Jordan:

Overall Score	Low	Medium / Low	Medium	High / Medium	High
Macroeconomic & Business Environment					

Sub Attribute Scores	Low	Medium / Low	Medium	High / Medium	High
General Business Environment					
Macroeconomic Structure					
E-Commerce					
Policies & Legal Framework					

As is apparent from the chart above, Jordan ranks low on the overall macroeconomic and business environment. In particular, its Macroeconomic Structure rates as Low. Some of the reasons for this suboptimal rating include Jordan's high unemployment, widening net fiscal deficits, increasing inflation, low Foreign Direct Investment specifically in ICT, low credit rating, and poor quality of the legal system, significant time required to clear insolvency, high taxation rates, and significant bureaucratic red tape. These factors impede the ability of the Jordan market to attract investors at desirable rates.

## Environment Support

The taxation issue, in particular, stymies efforts to promote further investment. There has been a lack of clarity around which taxation rate should be applied to various ICT companies (15% or 25%). While profit repatriation is free from constraints, fiscal incentives for ICT investments are similar to those offered to a few other sectors under the Investment Promotion Law (IPL).

Company registration and licensing remains lengthy and cumbersome despite improvements made over the past few years. There is strong support from the government and the His Majesty, King Abdullah II for the



development of the sector and the industry association is both active and persistent in representing the sector's interests and concerns. However, these positives cannot counterbalance the fragmentation of the sector and the regional instability, which impact Jordan's attractiveness to foreign investors. While the capital market is well developed, it does not provide funding for start-ups. The latter rely on banks, which require significant collateral. There are only two ICT venture capital funds (Foursan and JTG), despite an apparent demand for such funds. This creates a base of supportive qualified professional services such as fund management services, legal and accounting services. Additionally, mechanisms for reporting on the health and growth of the sector lack consistency in methodology, classification, and timing, making it difficult to compare the business dynamics over an extended period.

Our analysis, based partially on previous studies of the regulatory environment in Jordan, has identified the following constraints on the investment climate for ICT:

- Inadequate financial resources (especially to SMEs), including the lack of venture capital funds (Highest impact)
- Lack of reliable market data that allow forecasting and planning (Highest impact)
- Perceived regional instability (Medium impact)
- Competition from countries with favourable tax regimes and business environment (Dubai) (Medium impact)
- Lack of market data (Lower impact)

Promotional efforts should focus on the ongoing and adaptive regulatory reform process in which investors and businesses can have input and make a positive impact. Accession to the WTO and compliance with the Jordan-US FTA involved strict adherence to IRP laws have the potential to attract investors requiring patent protection when pursuing intellectual property based investments. Previous initiatives have helped modernize approximately 75% of Jordanian laws that impact the ICT sector, thereby helping business owners, investors and ICT firms in general.

In addition to previous efforts, Jordan has identified as part of its National Agenda, goals which will improve Jordan's Regulatory and Investment Climate, along three main dimensions:

- **Reforming government policies to stimulate economic development and improve social welfare and security.** Those which will create a favorable investment environment, ensure fiscal discipline, further administrative development, ensure accountability and transparency, improve labor policies, improve freedom of capital movement, reduce trade barriers, and support will positively impact the ICT regulatory and investment climate.
- **Basic Rights and Freedoms.** These initiatives will generally benefit the regulatory and investment climate more indirectly.
- **Services, Infrastructure and Economic Sectors.** Universal access to Information and Communications Technology ICT and sound financial services will directly benefit the ICT sector.<sup>23</sup>

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<sup>23</sup> National Agenda, pp. 4-5



## Appendix 2. e-Readiness Survey Results

	Connectivity and Infrastructure	Human Capital	Macroeconomic and Business Environment	Government	IT Industry and Innovation Capacity
High	Canada Israel Singapore USA	Canada Israel Ireland Singapore USA	Canada Ireland Singapore USA	Canada Singapore USA	Israel Singapore USA
High / Medium	Czech Republic Ireland UAE	Czech Republic	Israel	Israel Ireland Mexico IAF	Canada India Ireland
Medium	China Egypt Jordan Kuwait Mexico Turkey	India Jordan Lebanon Turkey UAE	China Czech Republic South Africa Turkey UAE	China Czech Republic Egypt India South Africa Turkey	Czech Republic Jordan South Africa Turkey
Medium / Low	India Morocco	China Egypt Kuwait Mexico Morocco	India Kuwait Mexico	Jordan Morocco	China Mexico UAE
Low	Lebanon Oman South Africa	Oman South Africa	Egypt Jordan Lebanon Morocco Oman	Kuwait Lebanon Oman	Egypt Kuwait Lebanon Morocco Oman



## Appendix 3. Strategy Development Participants



Int@j is the primary sponsor of the National ICT Strategy development effort. Int@j is an ICT industry-support association that embraces Jordan's ICT businesses with a mission to promote their advancement on a local and international level and enhance their capacity and performance.

### Consultants/Sponsors

The below organizations and individuals played a key role in the completion of this strategy. These companies have sponsored the efforts.



The Aregon Group assisted in planning the strategy development approach, the workshops, and an outline of the process to be followed. In addition, Aregon provided a technical writer to compile the draft document.

Team Members: Saif Khouri, Ala Shaban

Technical Writer: Mary Elizabeth Diab, PMP



The Arab Advisors Group provided figures and documentation vital to this effort. In particular, Arab Advisors obtained the latest available data on connectivity numbers.

Team Members: Jawad Abbasi, Faisal Hakki



2GC facilitated some of the strategy formulation workshops.

Facilitator: Dirk Khalff



Y-consult provided input and leadership to multiple pillars and performed detailed reviews of all documentation.

Team Member: Abed Shamlawi



*Supported by the Sustainable Achievement of  
Business Expansion and Quality Program  
(SABEQ)*

The USAID-funded Sustainable Achievement of Business Expansion and Quality (SABEQ) program provided input to the content, input into the strategy methodology, facilitation support, and assistance in preparing the final documents.

Team Members: Michael Capel, Laith Al-Qasem, Kinan Jaradat, Daniel Whitehead, Ayman Adhair





## Appendix 4. Int@j Board of Directors and CEO Signatures

We, the undersigned, are pleased to present this report and strategy document to His Majesty, King Abdullah II. It represents the work of many volunteers, listed below in Appendices 6 and 7.

### Int@j Board of Directors and Executive Leadership

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Marwan Juma, Chairman

---

Jawad Abbasi, Vice Chairman, Head of Connectivity Committee

---

Daoud Abboud, Treasurer

---

Hanna Zaghloul, Secretary General

---

Doha Abdelkhaleq, Board Member, Head of Education & Labor Committee

---

Ayman Mazahreh, Board Member, Head of Regulation & Investment Committee

---

Walid Tahabsem, Board Member, Head of R&D Committee

---

Mickael Ghossein, Board Member



---

Mustafa Nasereddin, Board Member

---

Ihab Hinnawi, Board Member

---

Hazem Malhas, Board Member

---

Sabri Tabbaa, Chief Executive Officer



## Appendix 5. Government Stakeholders Signatures

We, the undersigned, are pleased to present this report and strategy document to His Majesty, King Abdullah II. It represents the work of many volunteers, listed below in Appendices 6 and 7.

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### **Ministry of Information & Communications Technology (MoICT), Jordan**

HE Basem Rousan, Minister

---

### **Telecommunication Regulatory Commission (TRC), Jordan**

Dr. Ahmad Hiyasat, Chairman & CEO

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### **National Information Technology Center (NITC), Jordan**

Dr. Haidar Fraihat, CEO



## Appendix 6. Pillar Head Signatures

We, the undersigned, are pleased to present this report and strategy document to His Majesty, King Abdullah II. It represents the work of many volunteers, listed below in Appendix 7.

### Strategy Pillar Heads

---

#### Connectivity

Jawad Abbasi, Arab Advisors, int@j

---

#### Research and Development

Walid Tahabsem, ITG, int@j

---

#### Labor Issues & Education

Doha Abdelkhaleq, Eskadenia, int@j

---

#### Regulation and Investment Climate

Ayman Mazahreh, Arab Academy for Microsoft Technologies, int@j



## Appendix 7. Committee Members and Workshop Participants

Int@j would like to acknowledge the following contributors who assisted in the development of this Strategy.

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## Appendix 9. Summary of Assumptions/Calculations for Sector Revenue Target

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Exports	\$ 40,000.00	\$ 40,037.00	\$ 69,728.00	\$ 79,410.00	\$ 162,620	\$ 203,274	\$ 264,257	\$ 343,534	\$ 446,594	\$ 580,572	\$ 754,744
Growth		\$ 37.00	\$ 29,691.00	\$ 9,682.00	\$ 83,209.52	\$ 40,654.88	\$ 60,982.32	\$ 79,277.02	\$ 103,060.12	\$ 133,978.16	\$ 174,171.60
Growth %		0.09%	74.16%	13.89%	104.78%	25%	30%	30%	30%	30%	30%
Domestic	\$ 130,000	\$ 188,447	\$ 226,183	\$ 361,103	\$ 418,254	\$ 543,730	\$ 679,663	\$ 815,596	\$ 937,935	\$ 1,078,625	\$ 1,240,419
Growth		\$ 58,447.00	\$ 37,736.00	\$ 134,920.00	\$ 57,151.13	\$ 125,476.24	\$ 135,932.59	\$ 135,932.59	\$ 122,339.33	\$ 140,690.23	\$ 161,793.77
Growth %		44.96%	20.02%	59.65%	15.83%	30%	25%	20%	15%	15%	15%
Total	\$ 170,000	\$ 228,484	\$ 295,911	\$ 440,513	\$ 580,874	\$ 747,005	\$ 943,920	\$ 1,159,129	\$ 1,384,529	\$ 1,659,197	\$ 1,995,162
Growth		\$ 58,484.00	\$ 67,427.00	\$ 144,602.00	\$ 140,360.64	\$ 166,131.12	\$ 196,914.91	\$ 215,209.61	\$ 225,399.45	\$ 274,668.39	\$ 335,965.37
Growth %		34.40%	29.51%	48.87%	31.86%	28.60%	26.36%	22.80%	19.45%	19.84%	20.25%
GDP				\$ 11,510,000	\$ 12,085,500	\$ 12,689,775	\$ 13,324,264	\$ 13,990,477	\$ 14,690,001	\$ 15,424,501	\$ 16,195,726
growth %					5%	5%	5%	5%	5%	5%	5%
Total IT Turnover size relative to GDP				3.83%	4.81%	5.89%	7.08%	8.29%	9.42%	10.76%	12.32%
CAGR 01-05											
42% Exports											
34% Domestic											
36% Total											
<b>Assumptions and clarifications:</b>											
<i>Assume GDP to grow at 5% every year between 2006 and 2010</i>											
<i>Assume larger growth rate of exports than local IT turnover</i>											
<i>Target a total IT turnover size of 1.6 billion US\$ by 2010.</i>											
<i>This turnover size would be around 11% of GDP size (but this DOES not mean it contributes 11% of GDP)</i>											
<i>The above is for IT only.</i>											
<i>For Telecom and Internet services, turnover in 2005 was more than 950 US\$ million</i>											
<i>So, by 2010, its total size could be between 1-1.2 billion US\$.</i>											
<i>So, by 2010, total ICT turnover should be between 2.6-2.8 billion in total REVENUES.</i>											
<i>The above includes hardware, software, Cellular, fixed, Internet, exports etc..</i>											
<i>This total size would be close to 20% of GDP (but DOES NOT MEAN it contributes 20% of GDP)</i>											
<i>If you assume a value add of 40%, then contribution to GDP would be 8-9% of GDP</i>											

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