Advancing the Digital Agenda

2015

Qatar's National ICT Plan

ictQATAR

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Letter from ictQATAR Chairman of the Board

Our visionary leadership understood that an advanced ICT sector was crucial to an innovative, diversified economy and a high standard of living for all of our people. ICT supports all aspects of our national development plan – from sustaining economic prosperity to promoting human and social development to sustaining the environment for future generations.

This National ICT Plan 2015 builds on the significant progress Qatar has made over the past several years since ictQATAR, the country's telecommunications regulator and ICT champion, was established. This ambitious plan reaffirms the government's commitment to accelerating Qatar's efforts toward creating a vibrant ICT sector that will support the development of a knowledge economy and empower our people to use ICT to enrich their lives. The plan also points the way to Qatar becoming an ICT regional hub.

Several programs outlined in this ICT plan are strategically vital to Qatar's future development. Over the next five years, we will build a world class ICT infrastructure with the capacity and speeds that set us apart in the region. Qatar will invest $550 million to accelerate the rollout of a nationwide high-speed open and accessible broadband fiber to the home network.

And to attain strong international connectivity for all segments of society, ictQATAR entered into a joint investment with Eutelstat to build and operate a high-powered communications satellite scheduled to launch in 2013.

Achieving wide accessibility and effectiveness of all key government services through ICT is also critical to Qatar's progress. The National ICT Plan ensures the use of innovative applications to improve delivery of public services as well as increase demand for their use.

With ictQATAR's leadership and the commitment of every sector of our society, particularly government and business, we will succeed. If we seize the moment today, we will leave a lasting legacy for future generations.

Tamim Bin Hamad Al-Thani
Heir Apparent

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Qatar has made significant progress toward creating an innovative and vibrant ICT sector that will secure a thriving, diversified economy and enrich the quality of life for all members of its society.

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Progress and Challenges

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Nearly a decade ago, Qatar's leadership recognized that the future belonged to countries that could harness ICT for economic and social good. They envisioned Qatar in 2030 as an advanced society capable of sustaining its own development and providing a high standard of living for current and future generations. They understood that without a strong commitment to advancing ICT, their vision would not be realized.

Thus in 2004, the Supreme Council of Information and Communication Technology (ictQATAR) was created as the nation's ICT policy and regulatory body, and as the government's ICT champion.

As the world moves toward knowledge-based economies that rely on the production, distribution, and use of knowledge and information, ICT plays a fundamental role, both as an innovative economic sector and as a spur for other economic sectors. A country's ICT sector enables economic diversification and growth, drives innovation and entrepreneurship, and creates lucrative employment opportunities, developing a talent pool of skilled knowledge workers. On a worldwide scale, ICT created approximately 5 percent of total GDP growth and represented 5.4 percent of the world's GDP in 2008. That share could reach 8.7 percent by 2021.

Beyond important economic considerations, ICT helps address societal issues in profound ways. It improves access to education and enables lifelong learning beyond the classroom. ICT facilitates healthcare delivery, improves the efficiency and effectiveness of government operations, and helps strengthen citizen participation in government decision making. It offers greater accessibility to people with disabilities and other underrepresented populations and helps promote a nation's cultural and religious heritage through digitization of content. And ICT enriches the quality of people's lives by connecting them to each other, allowing for online collaboration and interaction in previously unanticipated ways.

Progress and Challenges

The creation and implementation of an ICT master plan in 2005 provided the initial blueprint for moving forward. That plan, along with Qatar's strong commitment of resources and ictQATAR's leadership, led to remarkable progress in a relatively short period of time.

- Massive private and public investment in the ICT market has rapidly increased, to USD 2.1 billion in 2010. ICT firms see Qatar as a potential technology hub and want to invest in the state, according to numerous market research studies.
- Qatar's telecommunications infrastructure has swiftly expanded and evolved, with the continued growth of next-generation access networks that provide ultrafast connectivity, making services more widespread and reliable. The launch of a new high-capacity communications satellite in 2013, along with a burgeoning network of submarine cables, will further increase bandwidth and speed.
- Competition created by market liberalization has already yielded tremendous benefits to consumers and businesses. Prices for mobile and fixed services have dropped, and the ICT contribution to GDP increased from 1.2 percent in 2008 to 1.6 percent in 2010.
- Government operations have been streamlined and more than 360 e-government services are already available online through a centralized portal—Hukoomi.

Numerous indicators demonstrate the strong foundation Qatar has laid for future progress.

- Qatar's mobile penetration stands at 167 percent, one of the highest in the world. For all countries the average is 76 percent, and among developed countries the average is 116 percent.
- In 2010, 89 percent of households had a computer and 85 percent of individuals had one.
- Broadband usage has jumped from 41 percent of households in 2008 to 70 percent in 2010.
- Qatar ranks in the top quartile of all countries surveyed in the latest World Economic Forum's Networked Readiness Index.
- The ICT market in Qatar keeps growing and is projected to expand at a double-digit compound annual growth rate.

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In spite of remarkable progress, the future success and growth of ICT in Qatar depends heavily on the country's collective ability to surmount key hurdles that currently impede the sector.

ictQATAR has identified several major challenges that Qatar must address to continue developing an innovative, inclusive, fair, and competitive ICT sector that will meet the country's future needs.

Connectivity Issues Qatar's telecommunications infrastructure has grown significantly, and current public and private investments to expand capacity are promising. Yet a shift to a knowledge-based economy requires a robust and ubiquitous infrastructure that enables high-speed broadband connectivity for all households and businesses. Currently broadband connectivity is not at the speeds required to meet the country's needs. Though Qatar is leapfrogging outdated technologies, keeping pace with demand is difficult, especially as new technologies and forms of media demand greater bandwidth and more sophisticated equipment.

ICT Skills Deficits While government agencies and schools continue to make great strides in integrating ICT into the lives and education of many members of society, Qatar's digital literacy still lags behind many other advanced nations. Because many lack the necessary digital skills and knowledge that are common among their peers in other developed nations, they are missing key opportunities to participate in the global digital economy.

Business Environment Challenges Qatar lacks the right environment to make greater strides in creating a vibrant ICT industry. Qatar needs to modernize policies and regulations to protect the interests of end users, attract further investment, and create a business model to stimulate the development of digital content, especially digital Arabic content. It also needs to support entrepreneurship to drive sustainable ICT growth.

In addition, Qatar also faces some pressing social challenges: controlling rising health costs, developing more efficient public services, integrating people with disabilities, motivating its youth, and digitizing its cultural heritage. Because the ICT sector is not fully developed, Qatar is not able to fully address these issues.

Moving Forward

Qatar is now at a critical juncture. If decisive action is taken and adequate resources are devoted to tackling the challenges outlined above, it has an unprecedented opportunity to accelerate its progress toward becoming a nation with a leading knowledge-based economy.

With increasing large-scale investment projects, rising government expenditure, and a population that is expected to grow steadily at an average of about 2.1 percent a year over the next five years, integrating ICT into the daily lives of everyone, and into Qatar's economy, becomes even more crucial. And to compete on the global stage for investment, talent, jobs, and economic influence, Qatar must continue to advance the growth of the ICT sector as a major pillar of its economy and society.

The aim of Qatar's National ICT Plan: Advancing the Digital Agenda is to continue to accelerate the existing momentum. This agenda builds on the first ICT master plan and takes into account research and analysis of Qatar's current ICT landscape as well as regional and international benchmarks. The plan provides a roadmap for future advancement that clearly outlines Qatar's digital goals and objectives, along with the strategies and initiatives to achieve them over the next five years. ictQATAR spearheaded this national effort, with the input of key stakeholder groups across the country.

Summary

Qatar's Digital Agenda is a five-year plan with a vision to create a knowledge-based economy that will drive sustainable development and societal benefits for all.

By 2015, Qatar will be benefiting from ICT solutions in key aspects of its society and economy. It will also be using ICT to become further integrated into the global economy. Qatar's plan has three desired outcomes:

- An advanced ICT sector that is the foundation for a knowledge-based economy
- The enriched lives of all members of society through ICT
- Recognition as a regional leader in Arab-originated digital content

Qatar's five-year plan is quite ambitious and has the following measurable goals:

- Double the ICT sector's contribution to GDP (USD 3 billion)
- Double the ICT workforce (40,000)
- Achieve ubiquitous high-speed broadband access for households and businesses (95 percent)
- Achieve mass ICT and Internet adoption by all segments of society (90 percent)
- Achieve wide accessibility and effectiveness of all key government services (160 online services)

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To meet those goals, a comprehensive, strategic framework has been developed. It is organized into five strategic thrusts—the critical components needed to create a sustainable digital future. These five thrusts will enable Qatar to become a leading knowledge-based economy, and they are aligned with the government's broader national goals as articulated in *Qatar's National Vision 2030,*and specific programs are aligned with *Qatar's National Development Strategy 2011-2016.*

Improving Connectivity

Ensuring the deployment of an advanced, secure infrastructure.

Providing access to high-speed, high-capacity infrastructure that is safe and secure is critical for national economic growth and for developing innovative products and services.

Qatar's Digital Agenda includes the following:

- Build an advanced, next-generation communications infrastructure that includes a national fiber broadband network and an ambitious satellite program
- Develop and modernize policies and regulations
- Enforce the safety and security of the digital environment through a national legal and regulatory framework
- Foster competition and a sustainable ICT environment
- Incentivize the ICT industry to develop innovative products and services

Boosting Capacity

Enhancing digital literacy and developing the skills to enable innovation.

To derive the most from the myriad potential social and economic benefits requires a coordinated national effort encompassing outreach, training programs, and awareness campaigns.

Included are these efforts:

- Developing an ICT workforce with the skills and knowledge that will lead to further sector innovation
- Garnering close-to-universal adoption
- Empowering individuals to fully participate in the knowledge-based economy
- Crafting a comprehensive and targeted ICT literacy outreach, awareness, and training plan aimed at strengthening ICT skills among all members of society, including business and government employees

Fostering Economic Development

Creating an environment for an innovative and vibrant ICT industry.

To set the foundation for a vibrant ICT industry, Qatar is deploying an advanced, secure infrastructure; developing the skills to enable innovation; developing the laws and regulations to advance ICT market development; developing tools that enable businesses to best use ICT; and driving demand for innovative applications and services.

Enhancing Public Service Delivery

Ensuring the use of innovative applications to improve delivery of public services.

Driving and encouraging Qatar's government and society to use ICT in sophisticated and innovative ways is essential to creating the next generation of government e-services, which in turn will enrich and further develop a broad array of public services and encourage the development of more local IT services.

Continuing programs include these efforts:

- Building a centralized government data center
- Enhancing security and authentication of digital government services
- Creating a single ICT backbone to connect all government entities

Advancing Societal Benefits

Leveraging ICT to improve ways society and government provide education, healthcare, and services to Qatar's people.

Qatar's agenda recognizes the numerous societal benefits that will derive from ubiquitous ICT use.

Programs already underway address these issues:

- Health: Better health systems to widen access to medical knowledge and patient records
- Education: Modernizing learning spaces and promoting the use of ICT to enhance the learning experience
- Society: Establishing programs and research efforts to study the impact of the Internet and its governance on the progress of society

The following section outlines the Digital Agenda in greater detail, highlighting the programs and initiatives that each strategic thrust comprises.

Strategic Thrusts // Programs and Initiatives

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In Brief

Illustration of Qatar's 2015 National ICT Plan

Initiatives

Qatar National Broadband Network
Free Internet in Public Spaces
International Connectivity and Satellites

Consumer and Digital Rights
Spectrum Planning and Policy
E-Commerce Regulations
Other Regulatory Issues

Critical Information Infrastructure Protection
Cyber Security Skills and Technical Capabilities
Government ICT Mission Assurance
Qatar Computer Emergency Response Team (Q-CERT)
Cyber Crime Law
Digital Privacy Law
Establishing Qatar National Public Key Infrastructure
Cyber Safety Guidelines and Governance
Cyber Users Empowerment

National ICT Maturity
Accessibility for All

ICT Professional Promotion
University ICT Education
ICT Vocational Training
Virtual Office Environment and e-Work
E-Learning and Lifelong Learning

Business Incubation
Business ICT Adoption and Promotion
Raising Awareness of e-Commerce and e-Banking Tools and Services

Digital Content Program
National Digitization Plan

Government Connectivity
Government Data Center
Security and Authentication
Next-Generation Government Shared Services Standards and Toolkits
Next-Generation Government Payment Platform
Next-Generation Government Services

Emerging Technologies
Internet Governance
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Improving Connectivity

Program 1 // **ICT Infrastructure**

- Qatar National Broadband Network
- Free Internet in Public Spaces
- International Connectivity and Satellites

Program 2 // **Modernizing the Legal and Regulatory Framework**

- Consumer and Digital Rights
- Spectrum Planning and Policy
- E-Commerce Regulations
- Other Regulatory Issues

Program 3 // **Cyber Safety and Security**

- Critical Information Infrastructure Protection
- Cyber Security Skills and Technical Capabilities
- Government ICT Mission Assurance
- Qatar Computer Emergency Response Team (Q-CERT)
- Cyber Crime Law
- Digital Privacy Law
- Establishing Qatar National Public Key Infrastructure
- Cyber Safety Guidelines and Governance
- Cyber Users Empowerment

A robust ICT infrastructure is critical to achieving the goals outlined in Qatar's Digital Agenda.

The ease and speed of connectivity are the foundation for all social and economic activities. Having a strong and secure ICT infrastructure also serves as a catalyst for future development of a national ICT sector, and provides access to and use of ICT services for other sectors.

Around the world, service providers are struggling to respond to burgeoning demand for faster and more secure networks. Qatar is meeting this challenge through a series of programs that will enhance access and speed. These programs will ensure that individuals and businesses can access the content and services they need to improve productivity while further reducing telephone and broadband costs for end users.

Program 1 // ICT Infrastructure

The aim in the next five years is to build a world-class ICT infrastructure with the capacity and speeds that set Qatar apart in the region while also distinguishing it as a global leader in connectivity. The infrastructure will provide the capacity to handle vastly increased bandwidth and enormous volumes of data. It will also increase connectivity within Qatar and internationally, along with providing access to all members of society.

Meeting these objectives will require intensive public and private partnerships and substantial investment capital from both sectors.

The following projects will be implemented:

Qatar National Broadband Network

Qatar's government established an independent company—Qatar National Broadband Network Company (Q.NBN)—to accelerate the rollout of a nationwide high-speed open and accessible broadband fiber-to-the-home network. The government will invest USD 550 million in Q.NBN.

Q.NBN will focus solely on the deployment of the passive infrastructure of the national broadband network, and licensed service providers will then lease access to the infrastructure to provide advanced services to individuals and businesses. Q.NBN aims to reach a coverage target of 95 percent of all households nationwide by 2015. This government-led initiative was developed in consultation with existing network operators and will support the development of their broadband service offerings. This network will

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By 2015, 95 percent of all households in Qatar will have high-speed open and accessible broadband.

also create the right environment for innovative small and medium enterprises (SMEs) to provide advanced services that are associated with high-speed connectivity and fiber such as traffic control and energy efficiency.

Other key features of the network will include the following:

- Speed The network must support a minimum speed of 100 Mbps for in-country active connections with fiber access to the home.
- Affordability Services to all segments of society will be affordable and set at competitive prices.
- Open Access The network will provide nondiscriminatory access to service providers through regulatory guidelines and standards that ensure optimal interoperability.

Free Internet in Public Spaces

In 2007, ictQATAR began offering free wireless Internet in three Doha parks. The service made the Internet available to broader segments of Qatar's population, particularly those without a home or work connection, many of whom found cost to be a barrier. In a year's period, 2009–10, more than 100,000 users took advantage of the service. In the past couple of years, free wireless was also made available in Aspire Park and at Souq Waqif, two extremely popular public spaces.

Based on the popularity and benefits to society of free wireless Internet, ictQATAR plans to expand it to additional public parks over the next five years, with two parks in the Doha suburbs being the first targeted. Additional organizations, including restaurants, shopping complexes, and private parks, are also moving forward on plans to offer free wireless Internet access. By 2015, Qatar aims to have a majority of its public parks and public spaces connected to wireless Internet, with as many offering free access as possible.

International Connectivity and Satellites

The global nature of Qatar's business economy and population necessitate strong international connectivity for all segments of society. There are a number of efforts underway, spearheaded by both ictQATAR and private sector companies.

- Submarine Cable System To more directly connect Gulf region countries to international networks and to meet rising demand for bandwidth, Gulf Bridge International, a Qatar-based company, is building a submarine cable system. This system is scheduled for completion by the end of 2011 and will add an additional high-speed link.

» Qatar Satellite Program This program was designed to provide Qatar and the surrounding Middle East and North African region with drastically enhanced availability and quality of communications services, including broadband and broadcast capacity. At the same time, it is a crucial step in ictQATAR's ongoing efforts to create a commercially viable and sustainable satellite entity in the long term as well as build a select position in regional and multiregional markets. To that end, in May 2010 ictQATAR entered into a joint investment with Eutelsat to build, launch, and operate a high-capacity communications satellite. The new satellite, scheduled for launch in 2013, will improve coverage and capacity across the MENA and Central Asia regions.

Program 2 // Modernizing the Legal and Regulatory Framework

As part of Qatar's Digital Agenda, ictQATAR is committed to ensuring that Qatar fosters a legal and regulatory environment that encourages growth and investment by responding and adapting to the latest technological advancements. Newly created policies and guidelines implemented in the last year helped create an open and competitive ICT sector.

ictQATAR will advance the development of a comprehensive ICT regulatory framework designed to stimulate investment and lower market barriers. It will support ICT and electronic media convergence, through relevant licensing and technology neutrality, and it will have effective enforcement powers.

Over the next five years, ictQATAR will remain focused on this goal by crafting policies that take into account emerging ICT needs. Key efforts include regulations with these aims:

» Protecting end users to ensure that personal digital information and data are handled responsibly and protected from misuse

» Attracting investment, and creating a business model to stimulate the development of digital content

» Protecting the intellectual property rights of digital content creators

» Eliminating barriers to competition in network services through open standards, interoperability, and technology neutrality

Consumer and Digital Rights

ictQATAR will continue to ensure that consumers benefit from competition in Qatar's telecommunications market, and will provide valuable and timely resources for consumers to make informed decisions. Consumer complaint processes will continue to be enhanced, with a core focus on transparency for both the consumer and the service provider. ictQATAR will also set guidelines to ensure that online transactions are safe for consumers and that their personal digital information and data are handled responsibly and protected from misuse.

Spectrum Planning and Policy

As more technologies are introduced, demand for radio spectrum continues to grow rapidly and must be carefully regulated. ictQATAR's role is to balance public and commercial interests in determining allocation and assignment of access to the

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spectrum. To meet this goal, ictQATAR developed a National Frequency Allocation Plan and completed a public review of this policy in 2010.

In 2011, the plan will be implemented to ensure that allocation needs are assessed and met transparently, meet public safety communications needs, ensure interoperability of all available communications technologies, reduce regulatory barriers, support and promote innovation and competition, and reserve appropriate spectrum for future innovative technologies.

E-Commerce Regulations

Qatar's Electronic Commerce and Transactions Law, enacted by Emiri decree in August 2010, makes online communications and financial transactions legally enforceable, offers greatly expanded protections to businesses and consumers, and establishes ictQATAR's regulatory mandate. Over the next five years, ictQATAR will develop regulations and protocols around the e-commerce law to further ensure online consumer protection, data protection, and privacy.

Other Regulatory Issues

As part of its regulatory charge, ictQATAR is working with mobile providers to ensure that the cellular transmission towers throughout Qatar are safe and will not have any detrimental impact on the environment. ictQATAR will establish regulations that establish regulatory practices for limiting human exposure to radio frequency and electromagnetic fields. These technical regulations are also intended to protect the public from any adverse health effects, comply with international standards on exposure limits and protection, and ensure relevant authorities are consulted and informed before radio apparatus is deployed.

To accelerate the rollout of a nationwide high-speed open and accessible broadband fiber-to-the-home network, the government will invest USD 550 million.

Program 3 // Cyber Safety and Security

Maintaining a safe and secure network is crucial to instilling digital confidence in all members of society and ensuring that individuals, businesses, and government agencies are protected from online threats and disruptions.

Meeting this goal requires significant collaboration between the public and private sectors, with ictQATAR leading efforts to gather and disseminate relevant security information across the public agencies and private companies that are most crucial to the smooth functioning of society and business.

ictQATAR also continues to work closely with international agencies and groups to coordinate responses and share preventive strategies for dealing with cross-border cyber security issues. Through these

efforts, Qatar aligns itself with the most up-to-date tools and approaches for handling cyber security threats.

Key efforts include the following:

Critical Information Infrastructure Protection

ictQATAR will continue to develop strategies and implement policies to safeguard information infrastructure systems that are critical to national security, such as those used for power grids, oil and gas production, financial transactions, healthcare, and government operations.

ictQATAR will also ensure the ability of government ICT systems to support the operations of the Qatari government by maintaining the confidentiality, integrity, and availability of information, communications and technology assets, and resources.

The following steps will be taken to protect the infrastructure:

- Identify critical information infrastructures
- Set a national policy for the protection of critical information infrastructures, including necessary protection measures and the roles of key stakeholders
- Coordinate with other regulators to ensure policies are up-to-date
- Raise awareness among stakeholders regarding adequate security controls

Furthermore, over the next five years, ictQATAR will also expand a robust authentication program, with a national ID card system for individuals to access information through government e-portals.

Cyber Security Skills and Technical Capabilities

ictQATAR will continue to assist in improving skill levels and technical capabilities of professionals working for Qatar's government and other critical organizations. This effort will focus on improving the overall level of cyber security capabilities for the Qatari government, industries, and society through leading-edge training and education.

Government ICT Mission Assurance

ictQATAR will develop information security policies and baseline standards together with a scheme for certifying government entities that meet these standards. This ensures that government information and electronic assets are safeguarded against cyber attacks and other cyber crimes. In addition, resiliency toolkits will be created to assist government agencies in evaluating and safeguarding their assets with up-to-date technology controls.

ictQATAR will expand its current robust authentication program to establish secure authorization and authentication for Qatari citizens and residents, businesses, and government employees. The program will introduce a national ID card system enabling only the most secure access to information through e-government portals.

Qatar Computer Emergency Response Team (Q-CERT)

Currently ictQATAR's Q-CERT team proactively searches for cyber threats and ensures that attacks can be detected and prevented before they cause real harm. The Government Security Operation Command Center monitors new developments on government and national networks and analyzes trends to ensure that responses to cyber incidents are both evidence-based and coordinated. In addition, Q-CERT has established practices for investigating threats, including state-of-the-art digital forensics and malware analysis capabilities. Q-CERT also creates channels to enhance security preparedness and response through situational training programs. These efforts will be continued over the next five years, with regular upgrades to forensics capacities and increased coordination with global governments and stakeholders.

Cyber Crime Law

In 2010, the Ministry of Interior formed a multi-stakeholder committee to prepare cyber crime legislation that would address any criminal acts committed through electronic means. Such acts would include both technical unlawful acts, such as unlawful access, interception, and damage to networks, and general criminal acts, such as crimes against humans and crimes against property. The committee worked to align the law with the Budapest Convention on Cybercrime, and completed the draft cyber crime law in late 2010. The Ministry of Interior is currently moving the draft law through the legislative process. The cyber crime law committee included representatives from ictQATAR, General Prosecution, the Ministry of Justice, the Internal Security Force, and the Armed Forces.

Digital Privacy Law

ictQATAR is working with stakeholders to develop a legal framework to protect the privacy of personal information, which is critical to the healthy development of Qatar's ICT sector. This framework, targeted for completion by the end ot 2011, will set the minimum level of privacy protection required for all sectors, including finance, education, health, and law enforcement. The framework will draw upon international best practices, while being innovative, forward looking, and technology neutral in its approach.

ictQATAR is working with stakeholders to develop a legal framework to protect the privacy of personal information.

Establishing Qatar National Public Key Infrastructure

ictQATAR will develop a comprehensive, hierarchical Public Key Infrastructure (PKI) that will enable the effective and secure use of digital certification. The Qatar national PKI will provide a complete range of content security services for government agencies, including information encryption, digital signatures, and non-repudiation. Any disaster recovery plan will require the use of this PKI for securing and protecting all documents based on their security classification. The current e-transaction law provides legal coverage for the digital signing of government documents, and is a basis for the PKI.

Cyber Safety Guidelines and Governance

ictQATAR will convene an independent committee to promote the safe use of the Internet for all members of society, with a special focus on ensuring the safety of young people. The committee will include representatives from relevant sectors in Qatar, and they will collaboratively set guidelines and policies for Internet safety. They will also review international best practices on cyber safety to consider which ones should be adapted for local implementation, and will work with local Internet service providers to define standards for inappropriate content.

Cyber Users Empowerment

One of the most effective methods of maximizing security is raising public awareness of threats and encouraging information sharing among all constituents. ictQATAR has already conducted a series of public awareness campaigns and will build on those efforts over the next five years through its Cyber Safety and Security Outreach Project.

This project will ensure that all individuals, businesses, and government agencies are aware of online threats, and receive appropriate information and tools to protect themselves. Over the next five years, the following measures will be undertaken by ictQATAR:

- Raising awareness among segments of the population who are identified as at risk
- Organizing additional information campaigns, creating training programs, and developing tools to facilitate knowledge sharing among all members of society
- Conducting regular outreach and workshops in schools, for teachers and students, on cyber safety, addressing issues such as social networking, privacy, and cyber bullying
- Establishing a working group to develop a cyber safety curriculum for schools tailored for various grade levels

Boosting Capacity

Program 4 // **Digital Inclusion**

- National ICT Maturity
- Accessibility for All

Program 5 // **ICT Human Capital**

- ICT Professional Promotion
- University ICT Education
- ICT Vocational Training
- Virtual Office Environment and e-Work
- E-Learning and Lifelong Learning

Over the last five years, growth in ICT usage and adoption among all members of Qatar's society has been significant—household broadband usage alone has almost doubled over the past two years, and Qatar ranks third in the region on the ITU's ICT Development Index.

Actual progress, however, trails the country's potential for advancement. Many people do not fully understand how ICT can improve their lives, and some are hesitant to fully take advantage of ICT because of concerns reagarding security and safety risks online. Many also lack the necessary skills to take full advantage of ICT. By improving the knowledge base and familiarity with ICT for all members of society, these risks can be managed appropriately and usage will become more widespread.

Through the programs outlined below, ictQATAR and its partners will provide opportunities and resources for ICT skills development, and improve accessibility for everyone.

Program 4 // Digital Inclusion

ictQATAR is committed to developing a digitally literate population whose members share equal access to technology and opportunities to thrive in a knowledge-based economy. This program aims to bridge the digital divide in Qatar by enhancing ICT readiness and usage among all members of society and all businesses through meeting the following objectives:

- Enhancing ICT literacy of all people and of the workforce
- Enabling increased ICT adoption across society and businesses
- Educating businesses and individuals on how to effectively leverage ICT
- Regularly gauging ICT readiness and usage across society and key economic sectors
- Developing policies and plans to bridge the digital divide
- Ensuring accessibility of e-services to all members of society

Key initiatives for meeting those objectives include the following:

National ICT Maturity

ictQATAR will survey and analyze the state of ICT in Qatar, focusing on gauging ICT readiness and the potential usage of ICT across key sectors. The results of this survey will not only establish benchmarks for future progress, they will also be analyzed to

determine areas of focus for future efforts to bridge skills gaps. Future policies and initiatives will then be set to further develop an advanced ICT-skilled workforce.

Accessibility for All

To ensure that ICT products and services in Qatar are accessible to all members of society—especially those with special needs—ictQATAR will work with Qatar's assistive technology center, Mada, to formulate an e-accessibility policy. This policy will help disabled people overcome major barriers in utilizing ICT in their daily lives. It will address issues including requirements for telecommunications service providers to offer accessible services and handsets, accessibility requirements for public sector websites, accessibility of public service terminals and automated teller machines, and recommendations for producers and distributors to provide accessible digital content.

This policy will build on significant initiatives already undertaken by Mada, which opened in June 2010. Since then, the center has helped hundreds of people through training and providing them with technology to meet their needs.

Program 5 // ICT Human Capital

The presence of a strong and innovative ICT sector can attract foreign investment and lead to a self-perpetuating cycle of job opportunity growth in Qatar. Growing domestic demand and adoption rates are encouraging—according to a study by International Data Corporation (IDC), hardware spending on PCs, servers, and storage in Qatar increased by 23 percent from 2009 to 2010, and spending on software grew by USD 23 million over the same time period.

Formulating an e-accessibility policy will help disabled people overcome major barriers in utilizing ICT in their daily lives.

The strength of this sector, however, depends largely on Qatar's ability to foster the necessary technological skills development within its workforce. Initiatives to meet this objective involve the following:

- Partnering with educational institutions at all levels to develop relevant ICT curricula
- Enhancing recruiting and advanced training opportunities
- Encouraging companies to provide more on-the-job ICT training for employees

ICT Professional Promotion

ictQATAR will encourage the recruitment of professionals in the ICT sector and across the economy, while also raising the profile of ICT as an attractive career path. A large part of this effort will be an awareness campaign promoting ICT at the K–12 and postsecondary levels, with the goal of improving students' skills, offering mentorships, and building enthusiasm for pursuing ICT as a career.

University ICT Education

Higher education institutions will work with ictQATAR to enhance the ICT capabilities and job skills of university students to ensure the future marketability of their graduates through developing intensive ICT educational programs, on-the-job training, internship programs with leading ICT companies and local employers, and international exchange programs.

ICT Vocational Training

Vocational training programs are a vital resource for workers to gain the required skills for employment in ICT careers. ictQATAR, the Supreme Education Council, and Qatar's vocational and higher education institutions are working together to ensure that training courses and certification programs are offered to employees. They are also working to encourage participation in these programs.

Virtual Office Environment and e-Work

ictQATAR and the Ministry of Labor are working together to empower all members of Qatar's society to participate in its vibrant workforce through advancements in communications and technology. ictQATAR completed a study in 2010 that detailed how technology can allow more people to work from home, particularly those with physical and societal barriers. The study identified specific jobs and responsibilities that could be conducted through a virtual office environment (VOE) model.

From the resulting analysis of the effectiveness of remote working arrangements in five sectors (oil and gas, government, banking, health, and telecommunications), ictQATAR is implementing a one-year pilot project working with a range of stakeholders to test the VOE concept—providing the infrastructure, training, and support to allow effective work-from-home arrangements. Based on the result of this pilot effort, the Ministry of Labor will explore changing existing labor laws and policies to allow for full-time e-work, in addition to the recent policy changes implemented to enable part-time e-work.

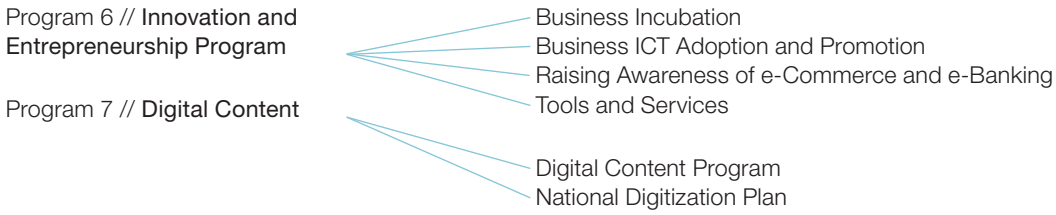
E-Learning and Lifelong Learning

Lifelong learning is an essential component of developing and sustaining a knowledge-based economy. ictQATAR is working to build a culture of e-learning among individuals and organizations to help foster lifelong learning in all sectors, including government, business, healthcare, and education.

The Qatar National e-Learning Portal was developed as part of these efforts, and offers online courses in IT and business for ICT professionals and partner organizations. Already, more than 2,000 people have completed courses through the e-Learning Portal, including 30 percent of state employees and 15 percent of non-IT business employees. To build on this already strong momentum, ictQATAR's future efforts will focus on these strategies:

- Promoting wider utilization of the 3,000 web-based training courses available on the portal
- Empowering organizations (especially SMEs) with enterprise learning management systems
- Supporting government and private sector organizations in their e-learning efforts
- Raising awareness of the benefits of e-learning
- Providing technical support and training for organizations to administer and manage the portal

Fostering Economic Development



In collaboration with other government agencies and the private sector, ictQATAR has made great strides in laying the foundation for innovation in the ICT sector.

To meet its ambitious goal of becoming a leading regional ICT hub, ictQATAR is working with partners to create incentives and favorable conditions for the emergence of new public and private markets for innovative ICT-based solutions.

Future programs will build on already-significant accomplishments, including these:

» Liberalizing the telecommunications market through foreign competition and participation

» Developing a strong base of e-services offered through i-Gov

» Establishing Malomatia, a domestic company that provides IT services to domestic government ministries and businesses

Furthermore, the Qatar Science and Technology Park provides facilities, services, support programs, and exemptions from trade regulations to assist science and technology firms in developing commercially viable technologies and technological solutions.

Thus far, the park has attracted international firms including EADS, ExxonMobil, GE, Microsoft, Shell, and Total. Collectively these firms have invested more than USD 300 million in QSTP, and are providing opportunities for partnerships along with a crucial foundation for an innovative cluster of technology companies.

The Qatar National Research Fund, a branch of the Qatar Foundation, has already invested in projects to develop automated tutors and interactive computer games, both of which are intended to improve education offerings for visually and aurally impaired people.

By leapfrogging outdated technologies and boldly proceeding to cutting-edge ones, Qatar can become a leading ICT hub. Through investment and continued support from Qatar's government and other stakeholders,

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ictQATAR will continue to foster the development of a positive environment for innovation and drive the growth and maturation of the domestic ICT market.

The following two programs are targeted to achieve that vision:

Program 6 // Innovation and Entrepreneurship Program

By acting as an aggregator of existing resources and information, ictQATAR will play a vital and unique role in stimulating entrepreneurship locally. Because of its authority as the national agency of information and communication technology, ictQATAR will act as a connector, bringing together a professional network of leaders from industry, research institutions, and businesses.

The following key efforts are central to this program:

Business Incubation

ictQATAR established an incubation center for new technology companies, with a specific focus on innovative digital content models to encourage growth in this sector.

The incubation center will develop a funding strategy, operating model, and funding mechanisms to support ICT ventures and SMEs.

ictQATAR will also provide the following forms of assistance:

- Acting as a liaison between ICT businesses, research institutions, and industry
- Fostering a collaborative environment to promote innovation
- Staging focused promotion and awareness campaigns to motivate potential entrepreneurs
- Providing market intelligence about opportunities, risks, and trends that are relevant to start-up companies

International firms have invested more than USD 300 million in the Qatar Science and Technology Park.

Business ICT Adoption and Promotion

Qatar's government recognizes the importance of a vibrant SME sector in Qatar in its efforts to diversify the country's economy. To help support the growth of this sector, the government, through the Ministry of Business and Trade, created Enterprise Qatar, a program to support SMEs by helping create an environment in Qatar conducive to innovative business models, and also offering tangible resources and assistance to new and developing SMEs. ictQATAR is partnering with Enterprise Qatar in the ICT realm, working to leverage ICT tools and knowledge to enhance the efficiency of SMEs' business operations, and helping to promote the growth of the SME ICT industry through the ictQATAR incubation center.

In particular, ictQATAR will focus on these tactics:

- Creating guidelines for businesses seeking to establish a web presence
- Providing information on enterprise resource planning
- Sharing security considerations for using email in business
- Promoting ICT services, including platforms for working remotely

Raising Awareness of e-Commerce and e-Banking Tools and Services

ictQATAR will further support the growth and expansion of local ICT businesses through a series of efforts to incentivize entrepreneurship, especially among young local talent. Business-friendly policies and partnerships, along with a regional business plan competition hosted by Carnegie Mellon University, will be the principal initiatives.

At the same time, ictQATAR will promote the continued revision and improvement of laws related to business and investment, including those covering labor, foreign ownership, corporate tax, customs clearance, contract enforcement, and company listings.

Program 7 // Digital Content

Digital content includes everything from news to emails and from e-commerce to search engines. It is the basis for everything on the Internet, and is an essential foundation for an innovative ICT sector. Yet only about 3 percent of Internet content is in Arabic, while Arabic is the fifth-most commonly spoken language in the world.

Increased creation and production of Arabic digital content and content from the Arab region through local media, locally hosted websites, and the digitization of cultural artifacts will be a significant driver of an innovative domestic ICT market. It will also help to establish Qatar as a regional ICT hub, and differentiate it from other countries in the region.

- Market conditions indicate that there is a strong unmet demand for more Arabic digital content
- Revenues from the sale of digital content in the MENA region are expected to more than double over the next five years
- 62 percent of Internet users in the Gulf Cooperation Council (GCC) prefer browsing in Arabic
- GCC countries have burgeoning economies, young populations, and mature mobile markets
- International players in the digital content market are minimally focused on developing content for the MENA region

Concurrently, Qatar has many favorable assets that will allow it to emerge as a leader in creating content, including its successful media and entertainment sector, along with available national resources to digitize national culture and heritage.

In order to harness the potential of the market and of Qatar's domestic advantages, however, key hurdles must be surmounted. The current market has a shortage of skills,

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inadequate financing, and a lack of innovative business models. To eliminate these barriers, ictQATAR is spearheading the following two initiatives:

Digital Content Program

Most of the efforts Qatar will devote to incubating new businesses through its incubation center will be focused on start-ups seeking to capitalize on regional demand for digital Arabic content. Creating a thriving digital content market will be highly dependent on the success of wider efforts over the next five years, including fostering an entrepreneurial environment, increasing Internet usage, modernizing digital content regulations, and implementing an advanced infrastructure.

In addition to these broader efforts, ictQATAR will also work on more specific initiatives, including these:

- Developing innovative tools to improve automatic translation engines and Arabic character recognition
- Creating programs to train students and professionals in digital media and marketing
- Instilling a culture of blogging
- Modifying policies to allow more local ISPs to provide expanding Internet hosting and data-storage capabilities
- Overseeing new domain name registration, particularly with new Arabic domain names

To help address the issue of digital content rights, ictQATAR has led the establishment of a Creative Commons affiliate in Qatar. Creative Commons is a non-profit organization that has developed content rights management licenses that encourage sharing, collaboration, and innovation online, while clearly defining the rights of the content creator. Creative Commons Qatar will work to promote usage of the licenses in Qatar among a range of content creators, and to build a culture of digital creativity and sharing that will help grow content from the region. Creative Commons licenses are one of numerous ways to help protect the content creator. ictQATAR will continue to explore other approaches, including looking at existing copyright and intellectual property laws in the country.

This plan will position Qatar as a regional ICT hub for creation and production of Arabic digital content and content from the Arab region.

National Digitization Plan

ictQATAR will develop a plan to digitize Qatar's heritage and culture, academic research, government laws and decrees, and health research. This plan will include incentives to drive the independent digitization of important cultural and heritage artifacts.

The plan will outline tactics for incentivizing the development of public-private partnerships, defining digitization standards, raising awareness of digital content, and ensuring that once created, digital records are maintained and preserved in an open and accessible format.

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Program 8 // **Second-Generation i-Government**

Government has been an effective driver of ICT penetration and usage. Qatar is ranked second in the world for ICT government readiness according to the World Economic Forum's ***Global Information Technology Report 2010–2011***.

In fact, ictQATAR's own report, ***Qatar's ICT Landscape 2011***, indicates that government is leading the way among all sectors in Qatar, with strong penetration levels in terms of PCs, Internet connectivity, broadband connectivity, LAN connectivity, and organizational web presence. In 2010, all core government ministries, councils, and authorities were using PCs and broadband Internet as well as maintaining dedicated websites. Through Qatar's newly improved online interactive portal, Hukoomi, more than 300 information services and 60 transaction services were available online in 2010, with additional services being developed. And ictQATAR is increasing government connectivity and transparency through the National Government Network.

Over the next five years, ictQATAR will use innovative ICT applications to improve the efficiency and transparency of the government and provide new transactional and information services, supporting other government ministries and agencies in achieving the goals of *Qatar's National Development Strategy 2011-2016.* ictQATAR will also create greater awareness of these services and the benefits individuals and businesses can derive from using them.

Program 8 // Second-Generation i-Government

Supported by robust, reliable ICT infrastructure, ictQATAR is moving to enhance and standardize government operations through state-of-the-art tools that enable information sharing between government agencies and with their constituents. It is striving to modernize and expand government services to find new ways to interact and serve the end users. Finally, ictQATAR is continuing to make government services more accessible through enhanced and secure delivery channels. Some key initiatives outline the government's efforts over the next five years.

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The National Government Network, connecting all government entities to each other through a single network connection, is already vastly improving the efficiency of government operations and services.

Government Connectivity

ictQATAR is rolling out a single ICT backbone that connects all government entities to each other through a single network connection. The National Government Network is already vastly improving the efficiency of government operations and services, facilitating the dissemination of information and the exchange of documentation. Currently, 12 government agencies are connected to the network, including ictQATAR, the Qatar Statistics Authority, and the Ministry of Business and Trade. Over the next five years, the current infrastructure will be enhanced and more ministries and institutions will be connected, including Qatar Foundation, Qatar University, and Hamad Medical Corporation.

Government Data Center

Establishing a centralized data center to house critical computer systems and associated components for all government entities will enhance efficiency and improve speed of access to information. The data center will standardize and streamline operations and maintenance processes. It will offer services such as application operations, database management, data center services hosting, IT management and support, and service desk. Construction of the center is expected to begin in 2011.

Security and Authentication

Expanding a robust authentication program will establish secure authorization and authentication for Qatari citizens and residents, businesses, and government employees. This initiative will enable digital cards and buildings with reading devices. It also involves establishing next-generation government standards and toolkits.

Next-Generation Government Shared Services Standards and Toolkits

Instituting government-wide IT standards and toolkits—including a service-oriented next-generation architecture—will enhance consistent, seamless, and secure exchange of information between government entities and end users. Over the next five years, ictQATAR will create a unified platform for Government IT, allowing for easier integration of systems. For example, the new Customs Clearance and Employment/Recruitment portals are based on the infrastructure and architecture of Hukoomi, so these and other new services can be easily integrated in an efficient manner and end users will have consistency in their online government interactions.

Next-Generation Government Payment Platform

A central national payment platform allows government entities to offer individual and business users the ability to pay for services online. By adding additional payment channels and improving customer service and support, the government's payment platform will be easier to use and more widely accessible.

Next-Generation Government Services

Developing second generation government services modernizes the e-services of government entities to better respond to the needs of individuals, businesses, and other government entities. Among the targeted services are these:

- Customs clearance services An automated and streamlined system will provide essential information to residents and businesses about customs clearance procedures. The result will be a customs clearance process that is more efficient and requires less paper.
- Employment and recruitment services The official job recruitment site for the State of Qatar is a high-priority initiative that will add value and transparency to the government's recruitment process. The E&R e-services will save time, effort, and resources in identifying appropriate candidates to fill vacant positions. Valuable services will also be available, including résumé writing, career guidance, and information about labor laws and regulations.

Other services targeted in the next five years include building permit services, visa and residency services, consumer protection services, and housing, real estate, and land services.

Advancing Societal Benefits

Program 9 // **e-Education**

Program 10 // **e-Health**

Program 11 // **Internet and Society**

Over the past five years, programs that utilize ICT to improve the way Qatar provides education, healthcare, and public services to its people have taken hold.

These programs focus on some of the nation's most pressing problems—rising health costs, integrating people with disabilities, and an education system that was not providing students with 21st-century skills.

ictQATAR has worked in close collaboration with both the Supreme Education Council, the nation's chief education policy-making body, and the Supreme Council of Health, the main health policy authority, to create strategic frameworks for national e-education and e-health programs, respectively. By 2015, these programs will be enhanced and new ones will be added, including an ongoing research initiative that will examine the impact of emerging digital technologies on Qatari society.

Program 9 // e-Education

Qatar's sweeping K–12 initiative to build a world-class public education system is invigorating Qatar's classrooms. ICT is an integral part of this transformation. Education tools can be customized for each student and adapted based on their skill levels and intellectual interests. Teachers can also collaborate with each other and improve the delivery of education by making it more engaging and interactive. Today, ICT is an integral part of a student's educational journey.

Qatar's ICT Landscape 2011 shows significant progress in the integration of ICT into Qatar's education system:

- 98 percent of primary and secondary schools have Internet access.
- 93 percent of schools are equipped with broadband access.
- Nearly 100 percent of school teachers, university educators, and university students, and 96 percent of school students have access to PCs for educational or personal purposes.
- By 2010, 71 percent of K–12 school teachers received ICT training.

While the Supreme Education Council has primary responsibility for Qatar's e-Education efforts, ictQATAR will provide the broad strategic framework and monitor progress.

The Supreme Education Council is leading numerous e-Education initiatives, including the deployment of advanced learning management systems that allow students, teachers, administrators, and parents to share information and communicate online; developing IT standards and frameworks that will be applied to schools across Qatar, including standards for deployment of IT in new schools; creation of a national e-library that includes digitized books and other learning resources; ICT training and professional development for educators; and increased usage of the National Government Network to enhance information sharing between schools.

ictQATAR is taking the lead on two e-Education initiatives, e-Maturity assessment and e-Content for education.

» The e-maturity diagnostic and self assessment tool created by ictQATAR measures the extent to which ICT is integrated and adopted in each school. Schools can evaluate their current e-maturity level, compare themselves to other schools, and develop targeted action plans to update and improve their technology. The assessment, which began as a pilot in 26 public and private schools, will be implemented in more schools across the country over the next five years.

» To improve ICT skills among K–12 students, ictQATAR will develop a broad-based strategy that will make digital content available for educational purposes, including a curriculum on cyber safety. The SEC will continue to develop curriculum-based digital content for the K–12 public schools.

Program 10 // e-Health

Precise and accurate information is essential to high-quality medical care and related health services. Huge amounts of data need to be securely stored, especially systems that manage workflow and patient records, which are vital for effective patient care. The more information available to doctors and other healthcare workers, the more informed and accurate their decisions will be. ICT can improve the ability of caregivers to perform the following functions:

» Monitor the health status of patients

» Provide accessible, quality healthcare for everyone

» Accelerate research and the dissemination of findings

» Empower individuals to take more responsibility for their own health

Nearly 100 percent of school teachers, university educators, and university students have access to PCs for educational or personal purposes.

ictQATAR worked with the Supreme Council of Health (SCH) and the Hamad Medical Corporation (HMC) to draft an e-health strategy that is currently being implemented. This strategy will enhance healthcare through better prevention, detection, diagnosis, treatment, and rehabilitation. The Hamad Medical Corporation and the Supreme Council of Health have begun efforts to build a unified health records system. Nearly 500 doctors, nurses, and therapists have already received training in how to use the system. Four of 12 hospitals have fully integrated the system, and it is now the standard for new hospitals in Qatar.

ictQATAR will continue to work with the Supreme Council of Health and the Hamad Medical Corporation to monitor progress and leverage ICT in ways that will enhance healthcare service quality and delivery. Key initiatives of SCH and HMC include a healthcare data warehouse information system to improve management and planning; rollout of a high-speed national healthcare network; defining of IT standards for the healthcare field to ensure interoperability of systems; development of an advanced electronic health record for all patients in Qatar; deployment of interoperable image-sharing platforms; development of an e-health portal that provides users with health information and services that will empower them to make informed healthcare decisions; and ICT training for medical professionals.

Program 11 // Internet and Society

As Qatar continues to advance in the digital age, ictQATAR will closely follow the impact of the Internet and its governance on the progress of its society through this newly established program. This program will serve as ictQATAR's research and policy hub, studying Internet technology, policy, and economics. The overarching objective of this research will be to ensure that ictQATAR is able to respond effectively to emerging technological, policy, and regulatory developments, and determine the most effective ways individuals and businesses can benefit from ICT innovations.

Through the work of Internet and Society, ictQATAR will become a thought leader and center for best practices on digital inclusion, skills, and engagement.

Several key initiatives will define this program over the next five years.

Emerging Technologies

This initiative will examine how new developments in digital technologies affect Qatari industry and society as a whole. It will explore issues including:

- How Qatar can work toward a long-term sustainable infrastructure
- How Internet developments can be implemented in a cost-effective way

ictQATAR will work closely with other government entities as well as industry as it examines these issues.

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Studying the impact of the Internet and its governance will ensure that ictQATAR is able to respond effectively to emerging technological developments and ensure that individuals and businesses can benefit from ICT innovations.

Internet Governance

ictQATAR, in collaboration with industry, other government ministries, civic organizations, educators, and other interested groups, will develop mechanisms to create a responsible and informed ICT environment, instilling core values of openness, transparency, and collaboration. ictQATAR will also work with organizations and individuals to establish an Internet Society chapter in Qatar to act as a forum to debate issues related to the Internet.

Internet Societal Impact

This initiative will be focused on the Internet's impact on the lives of those who live and work in Qatar. ictQATAR will conduct research into people's attitudes toward and use of communication technology to measure change over time and ensure that policies are in place to provide maximum benefit to the public.

Particular areas of focus will include the following:

- Informed society An informed society is one in which its people have the resources, education, and skills to access and participate in the free flow of reliable and useful information through a diverse range of platforms.
- Youth and ICT Technology is having a profound effect on all aspects of young people's lives. Understanding this impact—from how young people are using ICT to their attitudes toward technology—is essential to harnessing the power of ICT to help young people realize their full potential. ictQATAR has commissioned a comprehensive study to understand how Qatari youth are affected by and use ICT in their daily lives. A committee of academics, researchers, policy makers, youth advocates, and young people is contributing to a groundbreaking analysis using data from 1,200 young Qataris ages 11 to 29. Through exploring how this group accesses online content and communicates with each other, the findings will provide insight into how ICT shapes their identity in relation to their peers. This study can serve as a model in the Arab world and can be used in the future to provide a comparative assessment of the socioeconomic impact of ICT on this age group.

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By 2015, Qatar will benefit enormously from a vibrant and innovative ICT sector that will support the growth of a knowledge-based economy, position Qatar as a regional ICT hub, and empower all members of society to enrich their lives through the innovative and sophisticated use of technology.

Conclusion

Monitoring and Assessing Progress

A Final Note

Monitoring and Assessing Progress

Successful implementation of the National ICT Plan requires collaboration between ictQATAR and all invested stakeholders. It also requires regular monitoring of progress across key performance indicators and assessing each program and initiative at critical phases.

ictQATAR will develop benchmarks and a system to track and assess progress for all the major programs under the five thrusts. These metrics will be developed based on regional and international ICT benchmarks.

ictQATAR will also conduct an annual ICT survey to monitor adoption and usage of ICT in Qatar's households, businesses, and the government sector. The information gathered will enable ictQATAR to make a yearly comparison and assessment of progress in each critical area of the ICT sector.

A Final Note

The significant growth and maturity of the ICT market over the past several years has laid a strong foundation for future progress.

But much work remains. To meet the plan's ambitious goals, Qatar must accelerate its efforts. The strategies and programs outlined in this plan demonstrate the path to success. While ictQATAR is spearheading and coordinating the implementation of this plan, all stakeholders have a critical role to play. Among them, government agencies and departments will mobilize resources to deliver tangible programs and projects. The private sector will play a key role in the development and expansion of the next-generation ICT infrastructure and will provide new products and services. And the international community will not only serve as models for best practices, they will see that investing in Qatar is a smart business decision.

As Dr. Hessa Al Jaber, Secretary General of ictQATAR has said, "Everyone in Qatar should feel greatly empowered by the progress we have made. I am confident we are well on our way to even more incredible advancements."

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