



# Iran

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## OVERVIEW

Information and communication technology (ICT) accounts for 1.1 percent of Iran's Gross National Product (GNP), which suggests that it plays a minor role in the country's economy. In 2007, there were many challenges to ICT as an enabler of economic and social development. High inflation rates, officially pegged at 16.7, but widely mistrusted as being skewed due to the downplaying of skyrocketing housing costs, adversely affected new investments and raised production costs. Although Iran's new president, in office since June 2005, is popular among the masses in the Middle East and parts of Asia, he has incurred the ire of world leaders for his insistence on Iran's right to develop nuclear capabilities. Unfair economic sanctions against Iran spearheaded by the United States (US) and its European allies, although constantly mocked as ineffective by Iranian leaders, are crippling Iran's banking system and blocking the flow of technology and foreign investment.

A motion to eliminate numerous overlapping councils and organizations governing ICT affairs has been praised as necessary to boost government performance. Unfortunately, this belated motion has boomeranged as no credible study was made to formulate the country's roadmap to success.

E-Banking gained momentum in 2007 and an inter-banking network named Shetab, controlled indirectly by the Central Bank, handled 47.7 million<sup>1</sup> transactions on average per month. This represents a huge increase from the 25.9 million transactions of the previous year. Internet banking reached 0.093 million transactions per month or 0.25 percent of the total, which is an indication of the potential for growth.

The number of mobile subscribers reached 26.3 million in 2007, representing a penetration rate of 37 percent, while the

Population	71,815,000 <sup>a</sup>
Literacy (6 years old and older)	84.6% (male: 88.7%; female: 80.3%)
Area	1,648,000 sq km
GDP	USD 206.7 billion (current prices) USD 2,880 per capita
Unemployment rate	11.0 <sup>b</sup>
Inflation rate	17.6 <sup>b</sup>
Computers per 100 inhabitants	7.8 per 100 inhabitants <sup>c</sup>
Fixed-line telephones	23,484,000 lines (33.0 per 100 inhabitants)
Mobile phone subscribers	26,355,000 subscribers (36.7 per 100 inhabitants)
Internet users	11.5 million subscribers (16.0 per 100 inhabitants)
Domain names registered under .ir	72,330
Broadband subscribers	350,000 subscribers (0.49 per 100 inhabitants)
Internet domestic bandwidth	20,180 Mbps (est.)
Internet international bandwidth	9,626 Mbps <sup>d</sup> (December 2007)
e-Readiness overall score	3.08 <sup>d</sup>

(Sources: <sup>a</sup>Statistical Center of Iran 2006; <sup>b</sup>Central Bank of Iran 2006; <sup>c</sup>Computer Guild Organization 2006; <sup>d</sup>Economist Intelligence Unit 2007)

Notes: <sup>1</sup>Academics and independent research groups dispute this figure. They estimate a minimum inflation rate of 20.7 percent and an unemployment rate of 15.4 percent (Sarmayeh 2007).  
<sup>2</sup>Consultant groups and independent sources have estimated this to be not more than 5,500 Mbps.

number of Internet users grew to 12 million, also a remarkable increase. However, Asymmetric Digital Subscriber Line (ADSL) private licencees have expressed concern regarding the growth of the government-owned company competing in an unfair manner and complained about increasing difficulties in gaining access to infrastructure. In mid-2007 the third mobile operator licence first conceived in 2004 in the process of opening up mobile telephony to competition gained momentum and attracted investors to assess the market.

The Fuel Smart Card project (FSC) was implemented on a national scale in 2007. More than 10 million automobiles and three million motorcycles were issued an FSC to use in 2,300 fuel stations all over the country basically to prevent the illegal sale of gasoline sold at USD 0.1 per litre to neighbouring countries.

## TECHNOLOGY INFRASTRUCTURE<sup>2</sup>

In 2007 the Telecommunications Company of Iran (TCI) remained the sole operator of fixed telephony nationwide. Although five regional fixed line operators were granted regional licences in 2001, they have remained minor players. The TCI provided close to 10 million fixed lines (14.9 penetration rate) prior to 2000. This figure reached 21 million at the end of 2006 and 23.4 million (33.2 of 100 inhabitants) at the end of 2007.

The number of mobile phone subscribers grew to 26.3 million in 2007, representing a 130 percent increase from the previous year's total and a penetration rate of 36.7 percent. The growth is due mainly to the competition introduced by the second mobile operator, which commenced operations in 2006 and

accounted for a third of the total subscribers in 2007. A major development has been the marketing of prepaid SIM cards by the second mobile operator for an initial fee of USD 50, which was later reduced to USD 15. This is far more attractive to consumers than the USD 400 official price offered on a limited basis by the first operator for its postpaid services.

The packet switching data network based on x.25 introduced in 1994 has legacy subscribers mainly in government agencies and the airline and banking industries. The number of transmission circuits in 2007 reached 1.69 million.

The fibre optics network reached up to 375,000 kilometres by the end of 2007. However, the deployment of fibre optics in other infrastructure sectors, such as Iran Railways and Iran Power Generation, Transmission and Distribution Company (TAVANIR, <http://www.tavanir.org.ir>), remains unchanged.

In 2005 the Communications Regulatory Authority (CRA, <http://www.cra.ir>) opened satellite services to competition, targeting the issuance of five licences over a period of five years. Including the capacity created by TCI and the central bank, a total of 5,500 very small aperture terminals (VSAT) were in operation as of the end of 2007.

Among the services opened for licencing to the private sector were data communications service provider licences (known as PAP for ‘Public Access Providers’ in the Persian language). At the end of 2007 there were 11 private broadband operators in the market providing ADSL, XDSL, G.HSDSL, and wireless services such as Worldwide Interoperability for Microwave Access (WiMAX) to about 350,000 subscribers in more than 40 cities. Surprisingly, and supposedly to uphold standards of decency by preventing the downloading of unsuitable images and clips, the Ministry of Communications and Information Technology (MCIT, <http://www.ict.gov.ir/>) has banned Internet connection speeds higher than 128 Kbps to homes. The decree, which was made public in 2006, was heavily criticized, and it has hampered the growth of ADSL in Iran.

The number of Internet service providers (ISPs) remained steady at 747 as there was no policy to issue more permits. The same is true of the number of Internet connection providers (ICPs), which remained at 35 at the end of 2007.

In 2007 the Institute for Research in Fundamental Sciences (Institute for Research in Theoretical Physics and Mathematics — IPM, <http://www.ipm.ac.ir>) continued to preside over and manage the .ir top level domain. IPM started providing domain names in the Persian language in 2006. As of the end of 2007, in addition to the 72,330.ir domain names, there were also 4,300 Persian domains registered.

The number of Internet users is still a source of debate. The figure announced by the MCIT and its affiliates is 11.5 million, or 16.5 for every 100 inhabitants in 2007, which indicates a

50 percent increase from the previous year. Independent sources are questioning the MCIT figure.

## KEY INSTITUTIONS DEALING WITH ICT

The High Council of Informatics (HCI), composed of representatives of several key ministries and organizations, was the first body empowered by the Council of the Islamic Revolution to address and make decisions on computer-related issues in Iran. Its major activities in the first few years following its establishment in 1979 were to manage and settle claims and disputes with large international computer companies departing Iran at will. In 2001, the High Council of Information Dissemination (HCID), with its initiative called TAKFA (an acronym in Persian that stands for ‘Development of Information Technology Applications’), began to take over policymaking in information technology (IT), and the role of HCI as the policymaker gradually faded away.

In 2003, a law specifying the duties and powers of the MCIT was passed and the Supreme Council of Information Technology (SCIT, <http://www.shci.ir/>) was born. The law sought to:

1. Expand the duties of the new ministry from telecommunications and management of the radio frequencies to formulating strategies and the national IT plan and policies for the dissemination and implementation of information technology in social, economic, and cultural arenas nationwide; and
2. Establish a regulatory body to implement approved policies to restructure the telecommunication sector and allocate and monitor the frequency spectrum.

However, the new legislation fell short of dissolving outdated, ineffective, and redundant government bodies. Although the new SCIT, chaired by the president and managed by the MCIT, has taken over all aspects of ICT, overseeing digital content development remains the responsibility of the HCID.

Thus, the official policymakers in ICT in Iran are the MCIT, HCI, which is affiliated with the Management and Planning Organization, SCIT, and HCID, which is affiliated with the High Council of Cultural Revolution.

As part of a radical policy of downsizing, the President issued a decree in mid-2007 to dissolve or merge numerous councils with overlapping mandates. The decree included the merger into one council of most of the above-mentioned ICT-related councils. Unfortunately, the policy has backfired as no credible study was undertaken to design the roadmap to success.

Moreover, the parliament immediately expressed its disapproval, arguing that the move requires legislation that should be approved by the parliament. With the parliament discrediting the President’s move to restructure the bureaucracy, legal entities dealing with ICT have been left in disarray and no one is being held to account for various negative developments. In late 2007 the parliament finally passed a law enabling the government to pursue a limited restructuring effort, but this law is pending approval by the Guardian Council.

In addition to the official bodies, the High Council of Cyberspace Information Exchange Security (AFTA, <http://www.afta.ir/>), which is affiliated with the President’s office, has assumed responsibility for security issues among government organizations. Other government-affiliated supporting bodies or organizations involved with ICT developments are:

- The Hi-Tech Industries Center (<http://www.hitech.ir/>) affiliated with the Ministry of Industries and Mines.
- The Electronics Fund for Research and Development (<http://www.esfrd.ir/>) also affiliated with the Industries and Mines.
- TASMA (Production and Management of Electronic Content, <http://www.scict.ir/>), an initiative to complement TAKFA started in early 2006 under HCID.

Several non-government organizations (NGOs), some of which have been active for more than a decade in Iran, are active in the ICT sector. They are the Computer Guild Organization, Iran Informatics Companies Association, Sanaray Software Export Research & Development (<http://www.sanaray.com/english/Site.aspx>), Informatics Society of Iran (<http://www.isi.org.ir>), Computer Society of Iran (<http://www.csi.org.ir>), and the Union of Iranian Software Exporters (<http://www.uiseonline.org>).

## ICT AND ICT-RELATED INDUSTRIES

The opening up of the telecommunications market at the end of the 3rd Five Year Development Plan (2000–2004) created an opportunity for small and medium-sized companies in electronic industries and encouraged new companies to join the bandwagon. Each of these companies created 300–2,500 jobs. In 2002, 22 new general contractor (GC) companies were registered and won contracts to install new Base Transceiver Stations (BTS) in the 1800 MHz band and widen coverage in the 900 MHz band. It was also during the 3rd Five Year Development Plan that the government privatized major government IT companies and reduced the involvement of such companies in major IT contracts.

However, the past three years until 2007 have seen a reversal of the policy, with major IT contracts being awarded to companies affiliated or associated with the government. This has resulted in a number of Iranian IT companies and professionals abandoning business in Iran to start afresh in Canada or the United Arab Emirates. Over the past decade, the migration of technical capacities from Iran has been fluctuating, with some reversal noted in 2003–2005. But the new wave of migration could prove detrimental to the growth of Iran’s IT industry and the economy as a whole.

While the production of telecommunications switches, fibre optic and copper cables, Liquid Crystal Display (LCD) TV and monitors, Global System for Mobile-Base Transceiver Station (GSM-BTS), antenna, power supplies, and the like did not expand in 2007, negative indicators have been noted in the same period, such as a reduction in the number of companies registered with the SHCI from 993 in November 2004 to 798 in 2007. Membership in the Computer Guild Organization declined to 650 in 2007. Moreover, ICT fairs, exhibitions, and events in 2006–2007 were smaller and had fewer visitors than in previous years, another indicator of the decline of ICT companies and business activities and of the need to revitalize the market.

## KEY ICT POLICIES, THRUSTS, AND PROGRAMS

Privatization was the main theme of ICT development during the 3rd Five Year Development Plan. Articles 24 and 128 of the Plan outline a framework for the development of the telecommunications sector based on three distinct and well-designed strategies:

1. Require the incumbent operator to extend coverage, diversify quality services, and boost performance by outsourcing its major activities and new developments of the network to qualified private sector companies.
2. Issue licences to the private sector to provide fixed-line telephony, cellular or mobile telephony, broadband data communications, and wireless services.
3. Establish a credible regulatory authority to implement the strategies and policies and guide the private sector to reach the milestones specified in the Development Plan.

The 4th Five Year Development Plan, covering 2005–2009, envisions the creation of a knowledge-based economy through:

1. Systematic expansion of ICT application consistent with national development goals.

2. Development of human resources as a strategic priority in the expansion of ICT application to create more ‘value creating’ jobs.
3. Cultural development and creation of an empowering environment for creating maximum national synergy.
4. Implementing the necessary infrastructure for development of ICT, including access network, security, laws and regulations, resources, and facilities.
5. Development of facilities and opportunities toward mobilization of the private sector.

The Plan also exempts technology parks from state and local taxes, on top of a number of other incentives, as a strategy to attract investors.

The Telecommunications Regulatory Organization was established in 2003 and the framework for granting the licences for fixed line telephony, mobile services, data communications, satellite communications, and Voice over IP (VoIP) was approved by the Communication Regulatory Commission. Between 2003 and 2005 all licences except those for VoIP were granted to qualified applicants.

TCI, which was established in 1963, was broken up in 2005 into four new companies in line with principles stipulated in the 3rd Development Plan. The four new companies are:

- Telecommunications Infrastructure Company (TIC), to concentrate on infrastructure maintenance as well as the development of new infrastructure, including the fibre and copper cable inter-province network and switches, microwave network, satellite earth stations, and international switching and calls.
- Mobile Communications of Iran Company (MCI), the state operator for mobile telephones and the country’s first mobile services operator.
- Information Technology Company (ITC, <http://www.itc.ir>), the state operator for broadband and international data communications facilities such as X.25 and gateways to the Internet and provider of access to major government users.
- The legacy TCI that now acts as a holding company managing baby TCIs and owns the provincial TCIs that are actually the provincial fixed-line operators with right-of-way benefits granted by law. The network of copper cables and wires to subscribers, distribution frames and posts is an asset worth billions of dollars that has been given to TCI for its development.

A report prepared in 2007 by the MCIT in response to criticisms about its anti-privatization moves indicates that the new TCI Company and all provincial companies shall be privatized.

However, analysts and consultants have criticized the plan as being anti-competition. This is because once it is sold for the best price, the last mile copper network could end up in the hands of one of the private sector operators, which in effect would be a monopoly albeit wearing a different façade.

With regard to public key infrastructure, the Root Certificate Authority and the second layer certificate authority were established in 2007.

To promote ICT projects by the private sector, the government grants low-rate loans through several agencies. One of these is the ESFRD, which was established in 1997–1998 with a total paid-in capital of USD 37 million. Its objectives are to promote entrepreneurship, software development, engineering services, international collaboration, and export. The ESFRD assists non-government ICT projects by extending inexpensive loans, issuing guaranties, and providing information services, and soon by means of venture capital investment. However, due to shortages in capital funds while lowering the interest rates for loans, the ESFRD now lacks financial resources to fulfil its mission.

The Ministry of Labor and Social Affairs (MLSA) also grants medium-term business and self-employment loans to small businesses. In 2006 and 2007, following the populism advocated by the government, the MSLA announced unlimited low-rate loans for rapid return investments and flooded the market with cash. The result is that the loans, which are spread over many sectors, have brought a huge amount of cash liquidity to the market with inflationary effects. Moreover, the loans have had little impact on the growth of the ICT sector as they have not been allocated to ICT projects.

In e-government, TAKFA was an initiative by the President’s special envoy and an instrument of the secretariat of the HCID in 2001–2004 primarily to assist ministries and other government agencies in the pursuit of their ICT development goals and projects. It encouraged government bureaus to explore how ICT can help them accomplish their mission, and it provided funding support for the integration of ICT into bureau operations. The initiative devised 110 major projects consisting of more than 5,000 sub-projects in almost all sectors.

However, there was no coordination between TAKFA and the HCI. Moreover, without a coherent vision and solid strategies, TAKFA initiated hundreds of open-ended projects. There were no specific selection criteria and no plan for monitoring and assessing project outcomes. TAKFA was also heedless of the capacity required for ICT development. In 2005, TAKFA faced numerous obstacles on its oblique course and, unable to establish any form of organization to be able to move forward, it perished in late 2005.

TASMA emerged in early 2006 and was nicknamed TAKFA2, although it is not a sequel to TAKFA. TASMA has seven areas of focus:

- e-Government
- Education and development of digital skills
- Higher education, health, and medical therapy and training
- Social services
- Commerce and trade
- Culture, arts, and Persian language and script in the computer environment
- ICT industry through small and medium-sized enterprises (SMEs) empowerment, incubation centres, and technology parks

However, TASMA’s ability to produce results is being questioned because there is no government recognition of and commitment to the role of ICT in development. Moreover, a parallel effort is in progress within the MCIT.

## LEGAL AND REGULATORY ENVIRONMENT FOR ICT DEVELOPMENT

The telecommunication regulatory authority was established in December 2003 following a comprehensive study conducted for the Ministry of Post, Telegraph and Telephone (MPTT, now the MCIT), in collaboration with the Management and Planning Organization and with assistance from the ITU. Among the study’s recommendations, which was based on international practice and which stakeholders in the ICT sector unanimously adopted, was the establishment of an independent regulatory authority prior to or alongside the privatization and opening up of Iran’s ICT market. It was believed that an independent regulatory authority, backed by the MCIT, would succeed in getting TCI to comply with the requirements of privatization.

The regulatory authority was designed to have a board or commission with the power to approve regulations for the shaping of the telecommunications market, and an executive body or organization to implement the regulations approved by law or by the commission, control and audit the service providers, and assess the outcomes of policies implemented. The first was the Communications Regulatory Commission, consisting of five members and headed by the MCIT minister. The second was called the Communications Regulatory Organization and was headed by the deputy minister of the MCIT.

The appointment of the head of the regulatory authority and the pivotal role of the minister in the commission was criticized from the outset as a design flaw that could undermine the

regulator’s credibility. But the counter-argument was that the new regulatory authority would not survive without the protection of the minister of the MCIT who has full control of the incumbent operator and that anything less, at least for the duration of the five-year plan, would result in the failure of privatization. It was noted that a controlled approach to deregulation and the opening up of the market is imperative in an environment that is fully managed by the government and characterized by a frail private sector consisting of small and medium-sized companies. It was also argued that getting the incumbent operator (TCI) to share the infrastructure impartially with other operators would require the intervention of the minister who alone had the necessary legal power to push for such objectives.

However, the expected removal of TCI’s monopoly status has in fact not taken place. The second mobile operator has complained about TCI’s shortcomings in providing access to the telecommunications infrastructure and about being pressured to comply with TCI’s pricing scheme. Now, independent analysts believe that to achieve the objectives set forth in the 4th Development Plan, it is time to press for a regulatory agency that is independent of the MCIT.

As one of the conditions for the licencing of the second mobile operator, the regulatory authority pledged not to issue a third licence for mobile services until two years after the licence of the second operator had been issued. The deadline has passed and the MCIT has announced its decision to kick off the licensing process before June 2008. However, no official specifications and information on the process have been released to date.

In late 2004, 11 licences were issued to provide the public with wired and wireless data communications services. The licencees, known as PAP operators in the local market, could provide any type of connection, such as ADSL, WiMAX, G.HSDHL, and other high-speed services, to upto 350,000 subscribers in more than 40 cities. However, beginning 2005, the PAP providers have expressed grave dissatisfaction with the regulatory authority and the MCIT, pointing to pressure from the incumbent operator for them to leave the market to government-owned and operated companies (see ‘PAP Operators Denied Access to the Last Mile’).

Another key initiative is the proposed legislation on freedom of information. The need for such legislation was first cited in 1995 by the HCI secretariat as part of its focus on legal aspects of ICT. Following scattered studies and a review of the literature over seven years and three years of work on the draft, the proposed act finally reached the parliament in 2005 for approval. The act, which aims to facilitate access for individuals to government and other public information, is expected to be signed into law within 2008.

## PAP Operators Denied Access to the Last Mile

The licences granted to 11 PAP operators were affixed to a set of commitments signed by the regulator and the MCIT minister. It specifies that they have the right to access the cable distribution frames and copper lines to subscribers that they specify. The provisioning of space and other telecommunications facilities belonging to TCI was promised on the condition that such facilities do exist at the centres or nearby buildings.

But a report issued by the PAP operators claims that on many occasions and in more than half of the telecommunications centres where the facilities are available, they were denied the service and their complaints to the regulator and the minister have not been acted upon. Moreover, in 2007 the PAP operators were encouraged by the MCIT to dissolve and become a partner to provincial TCIs. In return, the MCIT would outsource all existing and future ADSL development to them. Although the MCIT plan did not materialize and the PAP licencees rejected it, the PAP operators cite it as evidence of the MCIT’s backtracking on privatization and they blame this for rumours of a sell-out to TCI by some PAP operators.

(Source: *Communication World* 2005)

## DIGITAL CONTENT INITIATIVES

The growth of Internet usage in Iran is being driven by people’s need to express ideas and circulate news and information where ordinary means are not adequate or are expensive or where there are political and social controls and blockages. Newspapers, social organizations, and NGOs are using the Internet to spread their ideas, recruit members, and stay in touch with their members. There are numerous blogs and long mailing lists that are attracting more and more users by the day. The number of Persian blogs is estimated to be around 800,000. About an eighth of these is registered with service providers like Persian Blog (<http://www.persianblog.com>) and Blogfa (<http://www.blogfa.com>) and actively engaged in producing content. Other sources have reported the number of active blogs to be around 200,000, representing a 30 percent increase from the previous year’s total.

Tebyan ([www.tebyan.net](http://www.tebyan.net)) is a Web portal established in 2000 and affiliated with the Islamic Development Organization. It has generated about 350 Gb of cultural and Islamic content, mostly for the youth, and it has about 300,000 visitors a day. Tebyan also owns 30 ISPs in all states, which provide access to the portal.

TASMA was launched by the HCID in 2006 to promote digital content. The program is part of a restructuring plan that led the HCID to focus exclusively on Persian content and leave other aspects of ICT development to the SCIT. In 2007 TASMA organized an exhibition intended to introduce the main issues in content development and solicit support from the government. Unfortunately, the exhibition was not well attended.

Religious institutes capitalizing on public funds and donations have concentrated on digitizing old documents and inscriptions, some dating back to 1,200 years ago. These are available for a minimum charge in digital versatile disc (DVD) format.

## ONLINE SERVICES

The number of e-government services in Iran is very low compared to that in many countries in the Middle East. But the existing online services are now more diversified and are enjoying wide patronage.

In 2007, probably a turning point in the number and magnitude of e-government projects, one project attracted the most attention from the government and the parliament and it had a major impact on everyday life in Iran. This was the Fuel Smart Card project (see ‘The Fuel Smart Card Project’).

### e-Banking and Inter-Banking

Also in 2007 e-banking gained momentum with all public and private banks joining Shetab, an inter-banking system controlled indirectly by the Central Bank. The implementation of a real-time interbank gross settlement system (RTGS) is also in progress. Shetab handled 47.7 million<sup>3</sup> transactions per month in 2007, which represents a huge increase from the 25.9 million transactions of the previous year. Internet banking accounted for 0.093 million transactions per month, or 0.25 percent of the total.

## The Fuel Smart Card Project

The Fuel Smart Card project (FSC) was probably the single most important ICT project in Iran in 2007. The project had been proposed by previous governments but it was never implemented due to public resistance to rationing systems, as the latter call to mind bitter memories of the eight-year war with Iraq. The project was finally implemented in 2007 on a national scale, at a cost of USD 130 million. About 15 million cards were issued (of which one million were replacements for lost, stolen, and burnt cards). More than 10 million automobiles and three million motorcycles were issued the FSCs with specific gas quotas to use in 2,300 fuel stations covering 28,000 pumps all over the country.

Because the FSC is considered a mission-critical project by the government, the designers had to consider both online (priority) and off-line situations. Gas stations are grouped by regions, with local database servers in the regional bases and gas stations. These regional and local databases are updated by the central system a few times each day in order to be able to handle off-line incidents. The database system is reported to be available 96 percent of the time.

The FSC is capable of supporting e-purse transactions and it can connect to the Shetab gateway to handle gas payments and similar transactions. However, although this aspect of the project has been successfully piloted, no instruction for its regular implementation has been given.

The FSC project could also help the police department to complete its vehicle identification database, where many similar previous attempts have failed.

The project's next step will be the inclusion of gasoil used by trucks and buses in the rationing plan and use of the FSC infrastructure to implement rationing objectives. One of the main goals of the FSC project was to enforce a diversified rationing plan based on application and vehicle specifications, and control the black market and smuggling of USD 0.1 per litre gasoline to neighbouring countries. It was reported that during a three-month period, a total of 2,300 million litres of gas was saved from illegal business at the borders, resulting in savings of USD 920 million.

The experience gained by Iran Telecommunication Industries Co. (ITI) during the successful implementation of the FSC project has qualified the company to win a similar project in Syria.

(Source: Ghaemian 2008)

## Online Registration for University Admissions

Every year millions of high school graduates compete for limited places at prestigious universities and colleges. The process involves obtaining registration forms, paying the requisite fees, shipping the documents, and receiving the registration number that the applicant must present at the testing centre as proof of registration and payment. The process was widely considered to be tedious, time-consuming, and highly stressful given the grave consequences for the future of the applicants of a failure of postal services. In 2007, after a few years of trials in small colleges, the entire process was conducted online for 850,000 students nationwide.

Besides the burden inflicted on the applicants in the past, the ISPs had their own share of headaches when millions of registered applicants and their families used the Internet to access the few sites that published the examination results. Now the new online registration system allows the applicants and their families access to examination results without too much hassle.

## Online Registration of Candidates for Parliamentary Elections

Much less complicated (compared to online registration for admission to university) was the online registration of candidates in the parliamentary elections in March 2008. The anticipated number of candidates was less than 10,000 nationwide and the online service included the registration and notification of candidates of the status of their registration. The Ministry of Interior had proposed the project some years back but because of lack of trust in the supervising authorities, conservative chiefs and trusted merchants unfamiliar with and partly frightened by the stories of security flaws and technical glitches refused to give the administration a chance — until 2007 — to show them the benefits of e-government.

## Other Online Services

Payment of bills for electricity, telephone, mobile phone, gas and water services using ATM machines, websites, and telephone

banking facilities was implemented in Iran in 2007. Currently under study are an e-passport system, online visa application and processing, and an online vehicle identification system using radio-frequency identification or RFID.

## ICT-RELATED EDUCATION AND CAPACITY-BUILDING PROGRAMS

IT and computer engineering programs are widely offered in Iranian universities and other higher education institutes. Together these programs had an intake of 95,800 in 2007, which represents an 80 percent annual increase over the last two years. In 2007 the total number of students in computer and IT programs at major government (public) universities, without taking into account Payame Noor University (a distance learning public university) and Azad University (a non-government public university), was 108,700 students, of which 49 percent were female. Of the total, 45.5 percent were enrolled in post-diploma programs, 52.8 percent were in Bachelor’s programs, and 1.7 percent were in Master’s and doctoral programs. About 60 percent of the postgraduate programs in IT are offered in government (public) universities, and majority (62 percent) of the students pursuing a Bachelor’s degree were enrolled in Payame Noor University.

The number of graduates in fields directly related to IT is estimated to be about 20,000 per year, which far exceeds the number of job vacancies. The IT industries have criticized universities for not responding to the market’s need for more diversified and multidisciplinary programs and graduates.

The influx of students to the universities is putting a severe strain on faculty resources, which in turn is preventing faculty members from pursuing research and post-doctoral activities and new course designs. The decision of the government universities to offer more postgraduate programs (even a post PhD) is exacerbating the problem.

A total of 4,108 high schools was reported to have access to the Internet using DSL by the end of 2007. This number had increased to 5,813 high schools by April 2008.

As part of an agenda to promote entrepreneurship, the MLSA is pushing for vocational and postgraduate training to help entrepreneurs understand business and investment needs, and to make job seekers qualified for the market.

## ICT RESEARCH AND DEVELOPMENT

The Iran Telecommunications Research Center (ITRC, <http://www.itrc.ac.ir/en.php>) was established in 1970 by the

University of Tehran and the Government of Japan (NTT) to conduct research on telecommunications issues. The ITRC later became TCI’s research centre. In 2005 the ITRC’s mandate was expanded to cover research on a national scale and not just research related to TCI. The ITRC is fully supported by the MCIT and the head of the organization is directly appointed by the MCIT minister.

In 2006–2007 the ITRC went through a shakedown, including a redefinition of its goals and missions. However, the restructuring fell short of setting clear objectives and left unresolved the matter of whether the ITRC would become a private or a government entity. As a result, many ongoing projects came to halt and team members were laid off.

In 2007 the ITRC outsourced about USD 50 million of its research and development (R&D) projects to the universities. Its 2008 target is to outsource about USD 120 million of its R&D projects. A notable ITRC project was preparing the bidding documents for the third mobile operator to be managed by the regulatory authority. There are also pilot projects in New Generation Network (NGN), third generation (3G) network, WiMAX, and intelligent processing of medical information. In late 2007, the ITRC announced a new list of research priorities ranging from infrastructure to policymaking.

## CHALLENGES AND OPPORTUNITIES

The ICT sector in Iran faces a number of important challenges. First, conditions prevailing since 2006 have not been in favour of an open market and privatization, and recent ambiguous pronouncements by the MCIT and other authorities indicate that this trend is continuing. Mounting pressure from TCI on PAP operators, which is intended to re-monopolize the broadband market, and on other mobile operators to follow pricing schemes that are incompatible with the principles of competition, are a testimony to the fact that the regulatory body has lost its credibility to some extent. For this reason, the principles of regulatory independence and impartiality now need to be reaffirmed and heeded.

Second, the regulatory authority needs to take a stronger position in favour of competition in the ICT market and against monopolistic moves. A particular area of concern is the granting of VoIP licences, which is being derailed by the incumbent’s move to maintain its monopoly over international calls. In 2004, the MPTT (now MCIT) prepared a temporary (renewable annually) permit to regulate the growing market in international calls. The permit covered only international calls originating from Iran and declared terminating calls as illegal.



One year later, a full VoIP licence was drafted, finalized and approved by the Communications Regulatory Commission. The draft licence, which was based on a comprehensive model named ‘international voice services’, covered both origination and terminating calls, as well as transit calls, and could have eliminated the gray market operated by unlicensed companies. Unfortunately, the new VoIP licence was never issued due to a renewed claim by TCI that it has the monopoly over international calls by virtue of a 1965 government mandate. In its argument, TCI capitalized on the issue of security and centralized control, which has become a popular theme in the region.

Finally, the concerned government agencies should aim to foster the growth of mobile services in Iran. There has been rapid growth in mobile services in the region and in Iran’s neighbouring countries, with some of the latter achieving a penetration rate of more than 100 percent, compared to just 41 percent in Iran. This underlines the need to explore the opportunity and potential for mobile telephony in Iran.

## NOTES

1. All figures pertaining to the banking system are drawn from the Banks IT Commission, January 2008.
2. All figures in this section are from the 2007 Iran telecommunications indicators compiled by the Telecommunications Company of Iran.
3. All figures pertaining to the banking system are drawn from the Banks IT Commission, January 2008.

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