SOCIAL NETWORKS WITHIN FILTERED ICT NETWORKS:
A CASE STUDY OF THE GROWTH OF INTERNET USAGE WITHIN IRAN

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Abstract   This chapter investigates the growth of the Internet in Iran, the effect of Internet filtering, and the impact on marginalized groups including NGOs, female activists, religious minorities, the younger generation and the increase of the digital divide. Using secondary data from multiple sources, the chapter presents the current use of the Internet in Iran and makes comparisons with other countries in the Persian Gulf region. The chapter argues that Internet filtering and severe restrictions on SMS messaging negatively affect not only ICT expansion, but also civil liberties— thus increasing the digital divide regionally, as well as on a global scale.

Keywords: ICT, digital divide, filtering, weblogging, gender digital divide, NGO, civil liberties, democracy

1.   Introduction

In a report published by the United Nations Conference on Trade and Development, former UN Secretary General Kofi Annan observed, "Information and Communications Technology (ICT) have considerable potential to promote development and economic growth. It can foster innovation and improve productivity. It can reduce transaction costs and make available, in mere seconds, the rich store of global knowledge. In the hands of developing countries, and especially small and medium sized enterprises, the use of ICTs can bring impressive gains in employment, gender equality, and standards of living"'" [63].

Kofi Annan's articulation of the influence and impact of ICT on socio-economic development is supported by many researchers in the field of ICT development. Some researchers argue that ICT provides an environment for political freedom [49, 46], freedom of information [41], virtual rights [22] and digital rights [34]. It involves people in a new form of governance, that is, e-government [9, 15, 36], public participation in the form of e-democracy [12] and fosters engagement of associations and communities [13, 40, 48, 65] by utilizing civil societies, NGOs, human rights activists groups and marginalized groups [14,

18, 21, 33, 42, 47, 51, 53], providing them with the opportunity to access information and knowledge and disseminate it within the public sphere [46].

Scholarly research on ICT development in developing countries has identified that ICT and the Internet in particular, positively correlate with the proliferation of democracy [10, 51]. Other scholars consider ICT and globalization as a means of imposing Western culture onto other cultures through hegemonic power and dominance [45].

Some researchers believe the Internet is undermining the foundation of authoritarian regimes in the Middle East and Arab world [35, 8]. Wheeler [66] emphasizes that the use of the Internet to openly oppose the states' political agendas is often punished by imprisonment. Ghashghai and Lewis [23] state that many Middle Eastern governments fear the Internet will facilitate communication among "subversive" individuals and other organisations such as special interest groups that have political agendas that challenge the legitimacy of their governments. These governments justify Internet content filtering by appealing to a constructed Islamic "moral majority" and claiming to uphold the moral values of their society [66]. In particular, filtering is justified as sustaining Islamic values by protecting citizens from sites that contain pornography and other "depravities."

This chapter raises two questions: 1) To what extent do ICTs and in particular, the Internet, promote freedom of speech and gender equality in Iran? and 2) What is the impact of ICT filtering on these activities in Iran? I use narratives of the Internet's usage along with a comparison study with other Middle Eastern countries to analyze the impact of ICT tools such as the Internet and SMS on Iranian citizens' freedom of expression especially the pursuit of gender equality.

2.   Background

Iran is a Theocratic Republic consisting of several interconnected governing bodies, with an Islamic Shi'a Law constitution. The chief of state is the Supreme Leader, a lifelong position appointed by the Assembly of Experts, who maintains the decisive edict in major political, cultural, religious, judiciary, foreign policy, and economic issues. The Expediency Council is a policy advisory body, which represents all major government factions, as well as clerics from the Council of Guardians. The Supreme Leader chooses the members of the Council of Guardians of the Constitution. Parliament (*Majles*) selects six jurists from a list of candidates recommended by the judiciary (controlled by the Supreme Leader). The Council of Guardians and the Supreme Leader have the power and authority to veto any proposed bills if deemed inconsistent with the constitution or Islamic Law. The President is head of government and is elected for a four-year term from a list of candidates adjudicated by the Council of Guardians. In the 2005 election, over 1000 individuals sought candidacy for election to the presidency. The Council of Guardians banned all but six [20].

Since 1987, Iran has seen the emergence of many political parties and activist groups. The government has a stronghold on freedom of expression by repressing

organized and individual freedom of speech. It regulates the press through censorship and restraints, supported by extensive laws. The government issues controls on publication, television and radio broadcasting, issuing gag orders on media coverage of specified events/topics, and has successfully jammed broadcasts. Website censorship is justified by authorities to prevent social immorality, preserve the religious or political authority, or to preserve national security. According to Reporters Without Borders [55], Iran has one of the worst press freedom records in Middle East.

Country	Land area (mil Sq. km)	Pop. (mil)	LE 2006	Adult Literacy 2006	GDPP (US$) 2006	HDI index 2006	HDI rank 2006	EFR rank 2006	Democ rank 2005	PF rank 2005	Constit
Iran	1.648	68	70.7	77	7,525	0.746	96	156	132	164	Islamic Shi'a

Table 1: Demographic Data, LE= Life Expectancy, EFR= Economic Freedom Rank, HDI=Human Development Index, PF= Press Freedom. Sources: UN, ITU, Freedom House, World Audit, The Heritage Foundation, Reporters Without Borders

2.1   ICT development in Iran

ICT development in Iran could have revolutionized communication capabilities among its people by facilitating news reporting, supporting cultural events, broadening the expression of political views and the dissemination of research articles, and engaging thousands of bloggers. Iran's initial ICT development dramatically increased the capacity and speed of its telecommunication networks but the government's control over and monopoly on ICT infrastructure impeded future development of the ICT industry. Many Middle Eastern countries took a liberal approach towards ICT development. Bahrain, Jordan, Kuwait, Qatar and United Arab Emirates (UAE) privatized their government-owned telecom sector, reduced Internet censorship, and successfully increased the volume of operations and services to meet the demand of their markets. In contrast, Iran implemented strict controls on ICT development, particularly by deterring expansion of high-speed internet connections. The government banned high-speed Internet accessibility [60] thus slowing the country's development and modernization. Most developed nations either have established, or are moving toward high-speed access to enable Internet-based applications such as e-commerce, e-banking, e-government and other information-based services that require a higher speed and more reliable Internet connections.

Rahimi [54] states that the Internet in Iran was first promoted by the government to provide an alternative option to scientific and technological innovation during the troubled economic period followed the Iran-Iraq war (1980-1988).

The growth of ICT from 1995 to 2005 was 4.9 fold due to the government's investment in an ICT infrastructure. According to the World Bank [69], Middle Eastern countries had the highest Internet growth in the world (370%) during the period of 2000 to 2005. The Iranian Internet usage had a growth of more than 2900% for the same period. Iran has not only seen an increase in the number of Internet users, but also a significant increase in the number of Persian "weblogs", especially among the younger generation. Alterman [8] argues that while the Internet is not yet a mass medium in most countries, in the Middle East and North Africa (MENA) region, it is growing in popularity among young elites. The use of the Internet to mobilize citizens for democratic changes in Iran challenged the conservative rulers in Iran. The massive usage of the Internet, e-mails, chat rooms and online meetings during the student uprising in 1999 followed by the shut down of reformist newspapers in 2000 [54] made the powerful conservative Supreme Council for Cultural Revolution declare a vague order to all ISPs in Iran to remove anti-government and "anti-Islamic" sites from their servers [54]. The order also mandated all ISPs to operate under government approved monitoring system to filter the Net content [54]. Despite these restrictions millions of Internet users found the Net to be a forum to express their opinions, thoughts and ideas on personal and social levels; expressions that could not otherwise be published through conventional media due to the degree of control by the Iranian government. Many NGOs, minority groups, religious groups, political groups/organisations, and silent voices have used this venue to attract more people to their agenda and programs.

3.   The Iranian Digital Society

Thousands of educated young men and women use one of the core components of ICT, the Internet, for promoting democracy, human rights, freedom of speech and gender equality in Iran. The increase in the weblogs and the proliferation of text messaging have enabled the formation of organized socio-political groups in Iran, reflecting the fact that young Iranians strive for changes in traditional Iran to allow for a space for the creation of ideas, promoting gender equality and respect for human rights.

The Iranian digital society seeks and finds freedom of expression on the Internet. Opinions, concepts, ideas normally filtered or suppressed, due to the monitored and controlled media, are expressed freely on the Internet. In this way, the Internet is becoming an increasingly popular tool among the young generation and those who want access to an unrestrained/uncontrolled source of information. Thousands of Iranian youths, men and women, are active in today's blogging and are among the world's leading Bloggers.

This activity has changed the social boundary that is drawn between men and women in their society; crossing the "red line" over which one cannot step and being a faceless opinion maker is a new experience that internet users in Iran are

practicing. Bloggers have also changed the conventional way of publishing ideas, namely the official means of publication.

A review over two Iranian web hosting servers, namely PersianBlog and Mihanblog, during the period of June 6th 2004 to August 5th 2005 (Table 2) shows that 78% of web postings receive responses of one or more comments. These response comments and their subsequent conversion into a multilateral discussion about social, political or cultural issues is a phenomenon that will slowly but undoubtedly help the emergence of a multi-voice society rather than the current single voice. As one Iranian blogger explains, "In my previous weblog there was no 'comments' section. I mean, I didn't allow others to voice their opinions…. When I enabled the comment section in my new weblog, I began to find it very interesting. As others commented and I responded, I noticed a gradual change in my real life as well" [9].

3.1   Weblogging in Iran

A more popular method of Internet usage in Iran includes both active and passive capacities that have enabled people to disseminate articles regarding social/political issues, art and humanities and personal expression (Table 2).

Some bloggers have and are using pseudonyms to avoid prosecution or other social problems whereas others do not go incognito. Various issues are discussed openly and brought forward to share and challenge the judicial system. This culls sympathy and empathy in order to place social and political pressure on government to overturn or rescind legal decisions. In a country controlled by Shi'ite Sharia law, there is little tolerance towards other religions. The Internet provides a secular environment. Weblog postings have challenged the theocratic system in Iran. Table 2 shows no more than 3% of all web postings relate to supporters of the theocratic Shi'ite system. It is of no little consequence that many of the government sectors including the judiciary have implemented harsh law enforcement against bloggers. The practice of Bahaism, one of the minority religions not recognized as legitimate in Iran, is forbidden. This and other religious minorities such as Sunnit Muslims, Christians, Zoroastrians, Sufis, and Jews have established their own web sites outside Iran [71] with the hope that their readers will forward their articles to users in Iran. Most Iranian bloggers are more interested in social and political issues rather than the religious Islamic practices that are discussed on official Islamic Shi'ite institutions' and schools' websites.

Weblogs contain art in the form of music and poetry. Many active music weblogs promote Western music. For example, the punk metal [17] groups and Rap lovers (such as Eminem supporters) that are officially forbidden in Iran are accessible on the Internet. Along with many Farsi-based music weblogs there are also weblogs belonging to the growing underground music scene. One of the most famous Iranian rap groups widely introduced on the Internet is "Emziper " [17].

Although access and exposure to the underground music scene is denied in the official Iranian media or public, it is widely accepted on the Internet.

Weblogs	Persianblog	Mihanblog
News	666	89
Journalism/ Literacy composition	2557	26
Trade and commerce/ e-commerce	2312	344
History	302	13
NGOs	176	-
Philosophy & Mysticism	1572	34
Islamic religion	2564	77
Computer Games	272	69
Humorous and Satiric webs	2559	227
Literature	5406	241
Cinema	991	51
Music	1015	530
Arts	2314	78
Sport	395	121
Technology	7202	31
Information and Communication Tech	4047	299
Health and Medicine	281	9
Nature and Environment	302	4
Research and Education	6694	142
Diary	14115	314
Public issues	29600	433
Neighboring countries	563	-
Total	85905	3132

Table 2: Number of blogs and topics hosted by two Farsi Weblog servers

Personal weblogs bring private domain issues into the public domain. A private domain is defined by the restricted and traditional society (as opposed to open society). Weblogs provide a platform for the expression of personal thoughts, sometimes using stream of consciousness, discovering intrapersonal and interpersonal areas such as self-regard, emotional self-awareness, assertiveness, independence, self-actualization, empathy, social responsibility, and interpersonal relationships. Iranian bloggers use this medium to express their inclusion within a

group that has a common goal: to have their opinions/views heard and validated. As one blogger states, "I am alive because I am writing a weblog. Weblog is my identity exact like my fingerprint that uniquely identifies me…I found freedom in cyberspace, I got self confidence by writing a weblog…I am not only a citizen of my country but also a citizen of cyberspace… "

Iranian women write some of the most popular blogs. A female Iranian pioneer blogger [32] stated: "I could talk very freely about things I could never talk about in any other place, about subjects that are banned…Women in Iran cannot speak out frankly because of our Eastern culture and there are some taboos just for women, such as talking about sex or the right to choose your partner…I have the opportunity to talk about these things and share my experiences with others". ICT has enabled communication to transgress gender boundaries in a gender-segregated society. While female bloggers enjoy the freedom of speech outside of Iran through the exchange of information such as the criticism of political situations in Iran with their homeland bloggers, their postings receive responses from within Iran, a phenomenon not experienced before. Some female bloggers within Iran have posted their weblogs to those hosted outside of Iran, freely criticizing political issues in Iran.

3.2   The Iranian women active on the Internet

Although Iran is a male dominated society, there are a growing number of intellectual and educated women making demands for a constitutional change in law to support gender equality. This has been a major impetus for many female weblogs to grow rapidly. The recent demonstrations by Iranian women [43], organized by Iranian Women NGOs and female bloggers, are examples of their struggle for raising their social status through gender equality.

Although primary schools and high schools are all same-gender schools, universities in Iran do not have this limitation. The assimilation of young boys and girls in universities in smaller cities has created cultural changes in these cities.

More than 58% of the country's students are women [58]. Iranian women enrolled in universities and other educational institutions are becoming highly qualified specialists in the field of medicine and ICT. This has resulted in promoting women's freedom and equality rights. Women are becoming more socio-politically active and taking their first steps in campaigning for equal rights, a campaign that is one of the strongest social movements in the Middle East, especially in the Persian Gulf. Li [39] points out that the female population is involved in social activities despite the social limitations placed on their liberty by the constitution and other laws of this Islamic republic.

The literacy rate for Iranian female adults increased from 68% in 1999 to 82.6% in 2004, an increase of 14.6%. The rate for Iranian male adults in the same period increased by 5.7% from 82% to 87.7%.

Although the number of educated women in Iran increased dramatically, the employment rate decreased during this period. The statistics published by the

Statistical Center of Iran shows an interesting picture for changes in higher education in Iran [58]. According to UNICEF [62] women's employment, which had reached a high of 13.8% of total persons employed just before the Revolution (1979), has actually declined since (12% in 1996). The desire for equality in employment opportunities is frequently expressed in hundreds of Iranian women's weblogs.

3.3   Civil society and NGOs online

Mostashari [44] argues that NGOs are an important part of social movements within a civil society. In Iran, NGOs are playing an important role in strengthening the foundation of an emergent civil society. In the Middle East, Iran is considered as having a highly developed civil society. It has many different active NGOs ranging from women's issues, development (school construction, cultural centers), community health promotion and education, emerging health crises (HIV/AIDS education and support [52]), community social problems (runaway girls, street children), environmental, to economic (career services, skill training, micro-loans). For example, the NGO "The Society for the Protection of the Socially Disadvantaged Individuals" is actively present on the Internet which aims to increase awareness and enhance discussion on social issues [57].

Other civil society groups in Iran presently active in cultural activities with enormous presence on the Internet include "The Iranian Writers Association" (http://www.Kanoon-nevisandegan-iran.org). Defending freedom of speech is the most important goal of the Iranian writers association. Their members are very active both online and printed publications in Iran through their personal weblogs.

At the same time, the presence of Iranian women in different NGOs (the number of Iranian Women NGOs increased from 67 in 1997 to 480 in 2005), and on the Internet has provided them with important tools to battle the social injustices dictated by Islamic laws. Publishing Internet weblogs has been a release valve to express and communicate their current situation to their audience, and is a means by which to increase pressure on Iranian policy makers.

Shirin Ebadi, one of the most appreciated Iranian female NGO activists, a recipient of the Nobel Peace Prize in 2003, played a vigorous role in Iranian NGO activities by taking part in the formation of the two most important NGOs in Iran. One is the "The Children Rights Society" in 1994 and the other is the "Human Rights Society of Iran" in 2001. Activities of the Children's Rights Society include sending informative news through the Internet to schools and giving access to students in order to identify problems and society's responsibility toward the matter. These activities will have a long term effect on the culture of Iran.

Iranian women are active in guiding NGOs. They not only attend NGO meetings, but also promote a movement in support of women's rights. Many of these NGOs question their "male dominated" society and have requested equal rights for men and women. Many websites and weblogs support this demand. Articles posted which pertain to social injustices advocate for changes in the

Iranian constitution. Many female-oriented NGOs instigated demonstrations in support of women's rights in Iran such as the one in Tehran on June 12, 2006 which protested the violation of women's rights in the constitution and the general humiliation of women in Iranian society. Unfortunately, if not unexpectedly, many of the female activists were arrested [43].

The "Stop the violence against women" movement is gaining substantial momentum particularly with the engagement of bloggers who campaign for cultural change and equal rights for Iranian men and women. These are examples of successful female-oriented sites. Several Iranian women's rights activists recently initiated a wide campaign demanding an end to discriminatory laws against women in Iranian law. Their Campaign "One Million Signatures Demanding Changes to Discriminatory Laws" went online to attract more people to their agenda [5].

3.4   Online news

Weblogs related to news and political topics were among the first weblogs censored by the Iranian government. The judiciary decision to shut down many reformist papers [54, 61] was one of the main reasons for going online to publish what authorities censored. There were firm restrictions on the allowable content for media publication. The atmosphere of censorship and self-censoring on publications caused rapid development of weblogs to compensate for the current lack of sources of information. Many Iranian university students converted weblogs into an important source of political and human rights debates. Thousands of weblogs became a fast and reliable source for collecting and distributing news and political discussions in response to the lack of reliable sources of information since the government controls all of the major broadcasting institutions including national radio and TV. The judiciary helps to maintain state control of the media. The government's reaction to the proliferation of weblogs was to filter popular sites, weblogs, and arrest many blogging activists, especially those who posted articles challenging the political hardliners [1]. "We have suffered under unjust press laws," said one of the members of the Iranian branch of the Committee to Protect Journalists. "We are afraid of more to come with this new parliament" [1],

3.5   Mobile SMS

Another ICT tool widely used for communication and exchange of text, image, and video messages is the mobile cell phone. The Short Message Service (SMS), commonly known as "text messaging", is particularly popular among young people. It has transformed the means of communication within that generation for personal, social, business, and political purposes. A popular feature of mobile cell phones is their video transmission capability, the Multimedia Messaging Service (MMS), which makes it possible to capture visually events as they occur. The increased number of posted cell phone captured video clips on YouTube that

originate from Iran attests to the importance of this type of ICT to support freedom of expression. Since most clips are politically motivated criticizing the current socio-political situation, they are not available through official media. In a recent video clip posted on YouTube called "No More Lies" [19] the video editor chides authorities for their persecution of Iranian young people who flout the dress code. The video is based on an Iranian underground rap song directed towards the political leadership and describes the official repression of young people. The 29-year-old editor of the video says that he simply pieced together snippets of videos and other images that were already on the Internet. The posting has received messages of support from Iranians around the world – including people inside Iran. "I've received many e-mails," he says. "I see there is a lot of discussion about [the video], it has already [more than] 95,000 hits. The message is the same – all Iranians are upset, there is lots of anger in their messages, they're really concerned" [19].

Surarez [59] argues that mobile cell phones have the potential to mobilize people and impose changes in certain aspects of political activities, including public participation in the political process. Regarding the use of SMS mobile messages in the Philippines Lallana [37] explains that text messaging is used as the medium for organizing rallies, spreading information, and stating political positions. SMS helped to develop the political account or interpretation of current events in the Philippines.

During the June 2005 Iranian presidential election, millions of young Iranians sent SMS messages to boycott the election or to support the other candidates. The massive use of SMS messages angered hardliners who appealed to the Ministry of Justice to ban SMS messaging [3].

4.   Iran state censorship on ICT

According to Reporters Without Borders' annual press freedom index [55], the Middle East region has one of the worst press freedom records in the world. In its press freedom ranking report, RWB announced that Denmark had the best press freedom record in 2005, while North Korea was placed at the bottom of the list (167th place). Some Middle Eastern countries ranked near the bottom including Iran (164th), Iraq (157th), Saudi Arabia (154th), and Syria (145th), while Lebanon (108th), United Arab Emirates (100th) and Qatar (90th) ranked somewhat higher. Kuwait had the best press freedom record in Arab world (85th).

Studies on Internet content filtering show systematic Internet filtering typically targets political and religious sites as well as those that promote gender equality and women's rights [50]. The Iranian government actively tracks and filters six major types of Internet sites. The sites under surveillance are primarily related to political and religious issues, ethnic minority groups, women's rights, or contain sexual content, or links to various international organisations. With the assistance of some well known international Internet companies [37], the government has implemented an effective Internet filtering mechanism to track millions of Internet

users searching the Internet for the latest news and information that is otherwise censored by the traditional local media.

OpenNet Initiative[1] (ONI) [50] reports that Iran's Internet filtering system is one of the world's most substantial censorship regimes. It was adopted at a time of extraordinary growth both in general Internet usage and in the number of its citizens who write online in Farsi. ONI explains that blogs have become an important forum for personal, social and political expression in Iran, and the move to control this content is consistent with the regime's overall Internet censorship strategy. The filtering Internet content has a negative impact on accessibility and increases the digital divide between developed and developing countries. It has a direct and profound impact on NGOs, minority groups, religious groups and other marginalized voices in the country. It further increases the gap between genders and their ability to access information technology. A "gender digital divide" is the ultimate result of Iran's Internet filtering especially when the number of special interest group web sites is on the rise. These groups and other individuals use the Internet to express their concerns about the current situation and are using it as a venue by which to increase pressure on Iranian policy makers [26].

Historically, women in the Middle East and North Africa region have had low levels of formal political participation, and little access to the political process or to state power as well [56]. However, a growing number of studies about the region clearly demonstrate that women are extensively involved socially and politically in local and international NGOs, local and transnational social movements and networks, including feminist ones, and the media [, 43, 44, 28] where they are actively working towards women's empowerment. A review of ONI's documents shows that the filtering applied on sites related to women's rights is placed among the highest on the filtering list (fourth place).

Filtering and censorship are also applied to other ICTs such as satellite TVs. According to Guardian news agency report [60], millions of Iranians use satellite dishes to watch Western television. In a recent crack down, Iranian police seized thousands of dishes in an attempt to end access to uncensored programming. The government further restricted ICT access by declaring it illegal for internet service providers to offer broadband internet connections. The government justified this action as an effort to protect the country's Islamic beliefs from Western influence.

5.   ICT development in Iran vs. other Persian Gulf states

Over the last decade, governments in the Persian Gulf region invested heavily in ICT, enabling them to not only renew but expand their ICT infrastructures via the implementation of new technologies. During the period of 1995 to 2002, expenditure on equipment, software and telecom services in these countries was an estimated 5.2% of the combined GDP of these countries. Overall ICT

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[1] The OpenNet Initiative is a collaborative partnership of four academic institutions: University of Toronto, Harvard Law School, University of Cambridge, and Oxford University.

investment during the period of 2000 to 2003 increased from 2.8% of the combined GDP to 3.02% [67].

ICT development in the Middle East was accomplished by the use of two different approaches. One approach was oppressive control of ICT development imposed by governments such as Iran in the area of Internet development, radio, and television broadcasting. In Iran, the telecommunication sector has been viewed as a key element of national military and economic security, too important to be left in private hands, whether domestic or foreign [24]. The second, more liberal approach, has been deployed by countries such as Bahrain, Kuwait, Oman, Qatar, and UAE. Their approach emphasized partial privatization of the state owned telecommunication sector. For example, Bahrain, one of the leading countries in ICT development, introduced telecommunication privatization in 2001 and opened its telecommunication sector to the private sector and foreign investors. The Kuwaiti Mobile Telecom company (Zain) became the largest private operator in the region providing wireless services to seven Middle Eastern and 15 sub-Saharan African countries [70].

The government of Qatar owns the telecommunications system Qatar Telecom (Q-Tel), which was partially privatized at the end of 1998. In 2004, the Supreme Council for Communication and Information Technology was created to enable and regulate the country's ICT sector [16, 4]. Similarly, the UAE's telecommunications entity "Etisalat" was 40% privatized [2]. Finally, in 2004, the Omani telecommunication sector opened its doors to the private sector as part of an agreement with the World Trade Organization (WTO). The government of Oman recently completed the privatization of Omantel [4], the country's primary provider of Internet services in October 2005 when its shares became available to foreign investors.

As Table 3 indicates, Bahrain, Kuwait, Qatar and United Arab Emirates not only had the most successful ICT implementation and digital access in the region, but also gained a ranking well above the world average. Iran on the other hand had the least ICT development in the region. According to ITU's 2007 dataset [29] Iran ranked in 105th place in ICT expansion among 183 economies. Countries such as United Arab Emirates, Qatar, Bahrain and Kuwait were ranked in 45th, 46th, 47th and 57th place respectively. This shows that the digital divide exists at both the regional and global levels.

Period	1996		2005	
Country	Internet	Mobile	Internet	Mobile
Bahrain	0.83	6.65	21.33	103.04
Iran	0.02	0.10	10.07	10.39
Kuwait	0.79	7.97	26.05	88.57
Oman	0.00	0.67	11.10	51.94
Qatar	0.99	5.69	28.16	92.15
Saudi Arabia	0.03	0.99	6.62	54.12
United Arab Emirates	0.39	7.78	31.08	100.86
World Average	1.27	2.5	15.25	34.02

Table 3: Mobile and Internet growth per 100 inhabitants, Source: ITU.

ICT development in Iran and Saudi Arabia warrants further comparison. As Table 3 indicates, Saudi Arabia saw enormous expansion in mobile development due to the establishment of a regulatory telecommunications authority in 2001 to implement ICT privatization [6]. However, Saudi Arabia's Internet growth is not particularly encouraging due to restrictive government policy in this area. According to ONI [50] and Reporters Without Borders [55], Iran and Saudi Arabia not only have ultimate control of Internet expansion but they also impose the most active filtering of Internet content [55, 50]. Iran, in contrast to Saudi Arabia, also imposes heavy governmental control on mobile expansion. Both Iran's Internet and Mobile growth show very limited growth despite the citizens' demands for services in these areas [31].

The Middle East's digital gap is best illustrated by comparing ICT expansion in Iran and Bahrain. As the Figures 1 (ICT index[2]) and 2 (Internet growth) indicate the digital gap between Iran and Bahrain increased by 1.2 fold during the period of 1995 to 2005. Two main reasons for this digital gap are: 1) Bahrain implemented partial privatization of its government owned telecom sector in 2001 and 2) Bahrain implemented a liberal policy towards Internet usage. According to the ONI report [50], Bahrain has the least amount and level of Internet filtering in the Persian Gulf region.

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[2] ICT index is a measure of four main ICT infrastructure indicators: fixed telephone lines per 100 inhabitants, mobile cellular subscribers per 100 inhabitants, computers per 100 inhabitants and Internet users per 100 inhabitants.
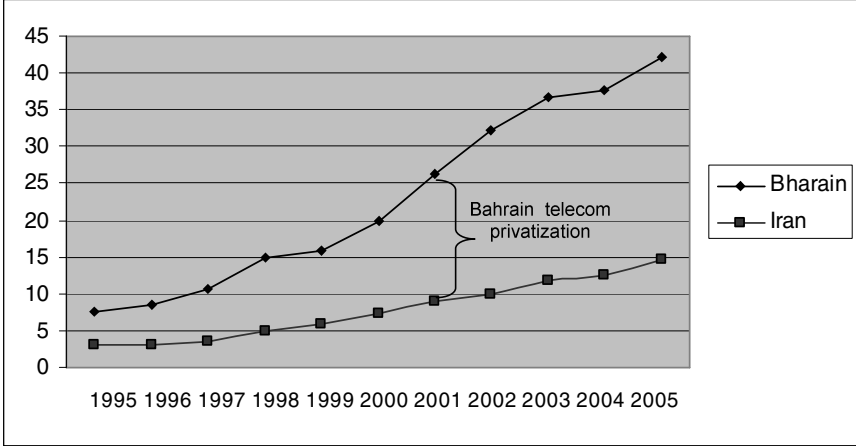
Figure 1: ICT index, the growth of digital divide between Iran and Bahrain. Source: ITU.

Many scholars view ICT privatization in developing countries as the key catalyst for modernization and expansion of public telecommunications networks [30, 27, 64, 11]. Specifically, the World Bank [67] emphasizes that governments can create competitive markets that grow faster, cost less, facilitate innovation, and respond better to user needs if they open their telecommunications markets through well-designed reforms resulting in increased private investment and ICT development.
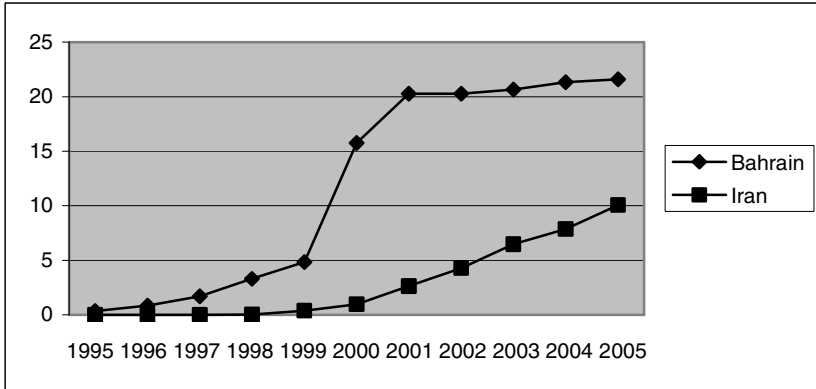
Figure 2: Internet users per 100 inhabitants. Source: ITU.

6.   Conclusion

During the last decade the digital divide increased between Iran and the rest of the world [29]. The digital gap is particularly pronounced when comparing Iran's position in ICT development with other Persian Gulf states. Even though Iran was one of the first countries in the region to go online [25] its Internet infrastructure development has lagged drastically from other countries in the region. State control of ICT development and Internet filtering by the Iranian government remain the two main impediments to Iran's ICT expansion. These barriers undermine future development of this industry. Perhaps more importantly, they negatively impact on Iranian citizens' freedom of expression and civil liberties.

The social need for individuals and groups to continue to interact and participate in social dialogue is growing with intensity in Iran despite governmental control and constraints on Internet content and activity. Government censorship drives a wedge in the ability of Iranians to communicate and share information thus inhibiting the development of social knowledge within their society. Because the mass of Iranian citizenry seeks secularization and liberalization of social and moral values [7] and mistrusts governmental information and intentions, they forge through and around political and physical obstacles by connecting with and creating cyber communities. These masses sift through opinions and facts to piece together a semblance of life outside their own world, seeking to learn about what they do not know. It is through this process that active and passive Internet users have developed a self and social awareness, a comprehension that they do not have what they need. They know that they do not know, and are willing to risk state sanctions to gain knowledge and inclusion in the global social network. Their journey of personal and cultural change continues in the face of official ignominy.

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