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# GSR

# 2010

# Discussion

# Paper

*Postcards from the Information Society:  
Living with Always-On Technology –  
the Good, the Bad, and the Just Plain Baffling*

***Work in progress, for discussion purposes***

Please send your comments on this paper at: [gsr@itu.int](mailto:gsr@itu.int) before 30 November 2010.





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# 1 POSTCARDS FROM THE INFORMATION SOCIETY: LIVING WITH ALWAYS-ON TECHNOLOGY – THE GOOD, THE BAD, AND THE JUST PLAIN BAFFLING

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## 1.1 Introduction

For nearly two decades, the world has been awaiting the arrival of the *Information Society*. Agencies and bureaus have been named after it. Programmes have been formed and funded to bring it about. So, how will we know when the long-anticipated Information Society has arrived? What will it look like when it gets here?

The answer is that for many of us, in many ways, it is already here. And the truth is, the Information Society is a richer, more varied – and often, more complicated – experience than we could ever have imagined. How do you know if you are living in the Information Society?

- You can apply online and fill out forms for routine government permits and fees without ever speaking to a government official – saving time and aggravation.
- You can make hotel reservations, purchase airline or train tickets, and "check in" while located miles away from the airport.
- While waiting for your plane, you "participate" vicariously in a young entrepreneur's trans-oceanic staff meeting, carried on at full volume on his open laptop computer.
- You see people strolling down city streets, seemingly babbling to themselves – until you get close enough to see the wireless earphones.
- You are able to order, online, a rare and beautiful handmade piece of jewelry made by artisans in your native country halfway around the world.
- You become "friends" on social networking sites with people you will likely never meet in person.

- Tragically, you are victimized by a financial or sexual predator, who fraudulently takes advantage of your hopes and dreams and betrays your trust.
- You log onto your workspace at the website of an online university, finding that your "classmate" on another continent has uploaded her part of your group project while you slept, allowing you to continue the work where she left off.

As it turns out, the Information Society is both magnificently liberating and calmingly natural – when it is not completely terrifying. On the positive side, broadband technologies can link people more easily to government services and market outlets, increasing quality of life and economic productivity. They are also revolutionizing social relationships and empowering civil society by linking individuals into social and interest groups. Around the world, they are altering politics, educating people in remote towns, and reuniting long-lost friends.

At the same time, there is a Pandora's Box of new issues: texting while driving; inappropriate content for minors; identity theft, malware and botnets; online invasions of privacy; fraudulent abuse of trust by individuals and organizations; and even (in rare cases) an almost pathological tendency to trade real life for a richer "cyber" life online. None of this was part of our world even 15 years ago. Our children will never know any other kind of life. Very rarely do we stop and ask: what does it all mean for us?

This chapter examines how the Information Society is changing every aspect of our lives. It also tries to provide an overview of what the Information Society really is – what we can expect when we join the online un-

iverse. This chapter describes the underlying technological developments in wireline and wireless networks and end-user devices. It explores the convergence of previously separate industries and products that is changing both government policy and daily lives. And it probes the roles of policy-makers and regulators, asking several basic questions:

- How can regulators ensure that the benefits of the new social networking websites and new social technologies are available to everyone – reversing the digital divide and not exacerbating it?
- What role do governments have in promoting social networking media or the underlying technology and market changes that make them possible?
- Should telecommunication regulators attempt to mitigate the unforeseen aspects of the Information Society, or are areas like computer viruses, data privacy, and online content beyond the scope of their authority?
- How can regulators in different countries cooperate to help guide the development of new media that clearly have international scope?
- What role is there for industry self-regulation? Can service providers and consumers send market signals to determine privacy protection and other standards?

Beyond the above, however, is the basic question: how do individuals who are now exposed to and experiencing the Information Society learn to maximize its benefits while managing the immense power that these new technologies have unleashed?

This paper takes an exploratory and critical view of the Information Society – not as it was predicted to develop, but as it actually is evolving in many areas of the world. As individuals, the "residents" of the Information Society inevitably experience myriad benefits, but also frequently find themselves in uncharted territory. As broadband networks grow (albeit unevenly), their capacity to carry multimedia content, as well as voice, is generating an unprecedented number of new services and applications. Where the Information Society has reached a "critical mass," user demand is driving growth in these new services and applications, often pioneering telecommunications into unregulated terrain.

Section 1.2 of the paper explores how far the Information Society has progressed, both geographically and in terms of new types of beneficial services. Sec-

tion 1.3 reviews the underlying technologies – from networks to handheld devices – that increasingly form the prerequisite for those services. Those sections provide an explanatory introduction to Section 1.4, which explores the effect of these "always-on" technologies and Information Society services and applications on our daily lives. Finally, Section 1.5 presents the challenges and some useful approaches for regulators as they attempt to understand and address the new Internet-infused world in which consumers now live.

As Sections 1.4 and 1.5 reveal, many of the issues confronting regulators are outside regulators' "comfort zones." That is, they often raise questions of social well-being in addition to economic vitality. Unfortunately, policy-makers and regulators often do not have the luxury of time in evaluating whether or how to extend their jurisdictions and rules to cover this new generation of packet-switched networks, services, and media. As the broadband revolution sweeps the globe, this paper explores how it is changing society, socially and personally, and what regulators are doing (and, conversely, *not* doing) in response.

## 1.2 *The Information Society Is Here – Or Is It?*

### 1.2.1 *Worldwide Acceptance*

In 2009, ITU estimated that more than a quarter of the world's population – some 1.7 billion people – were using the Internet.<sup>1</sup> Worldwide, the number of fixed broadband subscribers reached nearly 480 million in 2009, and ITU estimates indicated that the number of wireless broadband subscribers reached nearly 650 million, having passed the fixed broadband penetration rate the year before. While this marked a coming-of-age for an essentially new and revolutionary technology, the sober reality was that nearly three-quarters of the world was *not* using the Internet (see Section 1.2.2 below).

Nevertheless, there is evidence that people around the world have accepted the idea that the Internet is not only useful but perhaps even essential. During the spring of 2010, the BBC World Service carried out a survey in 26 countries, asking respondents about their opinions of the importance of the Internet and how it does or does not empower them (See Box 1.1). The BBC's headline finding was that a full 79 per cent of respondents in these countries regarded Internet access as a "fundamental right." Crucially, even 71 per cent of respondents that did not use the Internet (ei-



ther by choice or lack of access) felt they should have the right to access the Web.<sup>2</sup> Nearly half of all respondents (44 per cent) in countries around the world expressed the opinion that they would not be able to "cope" without having the Internet in their lives.<sup>3</sup>

Clearly, the Internet is providing value or at least an attraction. Moreover, that pull can be felt around the world, by people already experiencing the Information Society, and, perhaps more importantly, by those who want to experience it more fully. Increasingly, the Information Society includes an array of the following capabilities:

- Converged voice and data networks that empower text messaging, email and instant messaging, increasingly with pictures and multimedia content;
- Options for "e-government" services, allowing online public access to government information, programmes and services;
- Access to social and educational services, including distance learning, tele-medicine, job training, cooperative extension and other public benefits;

- A revolution in business and commercial behaviour, empowering telecommuting, accelerating e-commerce and innovating new "virtual" companies;
- A whole new universe of social networking, allowing individuals and groups to share information, pictures and contacts online; and even
- A growing "networked environment" of appliances, automobiles and handheld devices that are "aware" of their environs and can adapt their energy usage and other functions accordingly.

The following subsections briefly define and explore these manifestations of the Information Society, using examples from around the world.

### 1.2.1.1 Developments in E-Government

Governments began to make use of the World Wide Web almost as soon as it entered mainstream use in the mid-1990s. From almost 50 official government home pages in 1996, the number of websites ballooned over the next five years to approximately 50,000.<sup>4</sup>

#### Box 1.1: Is Internet Access a "Fundamental Right"?

In the global survey (26 countries) commissioned by the UK's BBC World Service, a full 87 per cent of respondents who use the Internet said they believe that Internet access should be considered a "fundamental right of all people." Moreover, even among those who do not use the Internet, 71 per cent agreed with that statement. The countries with the highest percentages of respondents that viewed the Internet as a fundamental right were Republic of Korea (96 per cent), Mexico (94 per cent), and China (87 per cent).

The survey went further, asking the 27'000 respondents exactly what benefit of the Internet they most valued:

- The ability to find information of all kinds (47 per cent);
- The ability to interact and communicate with people (32 per cent);
- The Internet as a source of entertainment (12 per cent);
- Tools to research, locate and buy products or services (5 per cent); and
- Forums for creating and sharing content (3 per cent).

Not all reviews of the Internet were glowing. The aspects of the Internet that caused the most concern internationally were:

- Fraud (32 per cent);
- Violent and explicit content (27 per cent);
- Threats to privacy (20 per cent);
- State censorship of content (6 per cent); and
- Extent of corporate presence (3 per cent).

Yet when asked whether the Internet should be regulated, more than half of Internet users surveyed (53 per cent) said governments should not regulate the Internet at any level. Individuals were surveyed in the following countries: Americas: Canada, USA, Mexico, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama, Brazil, Chile; Europe: UK, Germany, France, Spain, Portugal, Turkey; Africa: Egypt, Ghana, Nigeria, Kenya; and Asia-Pacific: Russia, China, Japan, South Korea, Pakistan, India, Thailand, Indonesia, Philippines, and Australia.

Source: "Internet Access Is a 'Fundamental Right'" at BBC World Service website, 8 March 2010

<http://news.bbc.co.uk/2/hi/technology/8548190.stm>

In May 2002, the UN undertook a global survey of its member states to measure the growth of e-government sites and to ascertain how they were being used. It classified online government sites according to levels of service they provided:

- **Emerging** – mostly information materials (32 countries);
- **Enhanced** – more sites, more dynamic information (65 countries);
- **Interactive** – allowing downloading, emailing and other features (55 countries);
- **Transactional** – allowing online payments (17 countries); and
- **Seamless** – full integration of e-services across administrative boundaries (0 countries).<sup>5</sup>

The fact that no government had yet achieved the UN's "gold standard" appeared to reflect a gap between what governments had envisioned in terms of public services and what they had been able to deliver up to that point. The report identified a lack of integration, or "one-stop shopping", among different agency websites, lack of user-friendliness and in many cases, lack of transactional capabilities.<sup>6</sup> E-government was, the report said, at a "crossroads."

Seven years later, however, significant advances in e-government have been made. The UN has continued to survey and monitor the development of e-government trends and services; in its 2010 report, the UN indicated that there had been a major step forward in e-government over the past two years.

*"On-demand access to information, services and social networks on the Internet through a personal computer is no longer considered cutting-edge in developed regions but a norm that many people take for granted. The same may soon be true of the more advanced middle-income countries."<sup>7</sup>*

The report noted that some governments, aware of the higher penetration of mobile services, had begun tailoring e-government applications to these users:

*"For example, alerts sent through short message services ("text messages") are being used to notify citizens that a request for assistance has been processed, that a permit needs to be renewed or that an emergency advisory notice has been issued. Cellular telephones are also being used in a more dynamic fashion to browse public services, authorize payments and engage in micro-volunteerism.*

*Cell phones are used, for example, to provide government agencies with images or descriptions of local environmental conditions and to respond to social surveys."<sup>8</sup>*

Middle-income countries have, in some cases, caught up with and exceeded wealthier nations in connecting their government offices and making e-government accessible. The UN report cited Ethiopia, which in 2005 adopted a national ICT policy, followed a year later by implementation of a five-year ICT action plan designed to boost public sector accountability and improve education, health, small business development and agricultural modernization. According to the UN report, "The country has now connected nearly 600 local administrations to regional and federal offices, linked 450 secondary schools to a national education network, and provided some 16,000 villages with access to broadband services."<sup>9</sup>

E-government programmes are increasingly incorporating advanced technologies such as GPS (Global Positioning System) and GIS (Geospatial Information System) features, allowing users to submit and access information that is specific in terms of location. Many of these capabilities include interactive and transactional features that combine location information with multimedia or graphical content. One such programme was launched in Singapore during March 2010. Billed as the "first intelligent map information system," the OneMap portal features a GIS map of Singapore. Users can click on a location and obtain information on government (and private sector) services and facilities at that location (see Box 1.2: Singapore's OneMap project).<sup>10</sup>

Perhaps the common hallmark of recent e-government initiatives is their emphasis on user accessibility and ease of use. As with other areas of the Information Society, however, e-government remains unevenly applied across the world, reflecting the ongoing digital divide.

#### 1.2.1.2 Public Services

In addition to open access to government, "netizens" of the Information Society increasingly benefit (either directly or indirectly) from the revolutionary use of ICTs to improve core public and social services. These include health and medicine, education and training, and agricultural or small business support services.

**Box 1.2: Geospatial Meets E-Government in Singapore**

Singapore's government has taken e-government to another level with OneMap, an initiative of the Singapore Land Agency. Essentially, OneMap is an interactive map portal that uses Geographic Information System (GIS) technologies to provide access to services and information at a mouse-click. Users view a map of Singapore and can roll over it to locate government services, information and even non-government offices and services.

Launched on 31 March 2010, OneMap has been described as a "complete, end-to-end geospatial value chain that acts as a bridge between public agencies and the public." Originally, OneMap brought together information from 16 government agencies – a number that has since grown to include more than 20 agencies, private and non-profit organizations. Among the features are locations for museums, food "hawker centres", day care services, parks, and sports centres. One feature allows users to determine whether their home is within a certain radius of a particular school.

OneMap also allows users to create their own applications based on the OneMap base maps. This allows the sharing of data through the Internet, for both desktop and mobile accessibility.

Sources: GIS Development: *The Global Geospatial Magazine*, at [www.gisdevelopment.net/magazine/global/2010/july/48-Onemap-One-stop-geospatial-solution.htm](http://www.gisdevelopment.net/magazine/global/2010/july/48-Onemap-One-stop-geospatial-solution.htm); "Check Out OneMap," *The Straits Times*, 1 April 2010, at [www.straitstimes.com/BreakingNews/Singapore/Story/STIStory\\_509240.html](http://www.straitstimes.com/BreakingNews/Singapore/Story/STIStory_509240.html); and Singapore Land Authority press release, 31 March 2010, at [www.sla.gov.sg/htm/new/new2010/new3103.htm](http://www.sla.gov.sg/htm/new/new2010/new3103.htm).

*Tele-Medicine and eHealth*

One of the most promising fields is "eHealth" – the use of ICTs for a range of medical-related clinical and support services. As the World Health Organisation (WHO) noted in a 2006 report:

*"Every day, across the world, people make improvements in health as a direct benefit of [ICTs]. E-health innovations like electronic health records, computer-assisted prescription systems and clinical databases are transforming health today, and hold even greater promise for the future. [ICTs] support clinical care, provide health information to the general public and scientific information to professionals. They provide a platform for publishing, disseminating health alerts and supporting administrative functions."<sup>11</sup>*

The first reported programmes to provide online health information to the public were in 1990, and by 2005, some 80 per cent of governments around the world were providing public eHealth information services.<sup>12</sup> That percentage ranged from 60 per cent in Africa to up to 95 per cent in Europe. WHO found a clear and consistent correlation between eHealth development and Internet penetration, and between eHealth development and national income.<sup>13</sup> WHO also identified a global shortcoming in eHealth governance, with only about half of its member states having an eHealth administration or governance structure.

*Online Learning*

Another field in which the Information Society is revolutionizing daily life is education. In developed countries, increasing numbers of students are taking courses online or receiving online content to augment classroom education. The U.S. Department of Education estimated, for example, that the number of primary and secondary school pupils receiving online courses grew 65 per cent between 2002 and 2005.<sup>14</sup> Based on its estimates, the Department determined that more than a million American children took online courses during the 2007-2008 school year. Somewhat surprisingly, the study found that children who took all or part of a class online performed better than other students who took the same class with only face-to-face instruction.<sup>15</sup>

In a 2002 report on the rapid development of online learning, UNESCO noted the advantages of incorporating Web-based teaching methods into school curriculum – even where so-called distance learning was not required for students to reach far-away schools. *"The Web offers a worldwide forum in which to teach courses that can be radically updated in ways never before possible," the report stated. "Each student has an enormous range of resources available, free from limitations of time and space."<sup>16</sup>* Fully realized, the Internet becomes a medium not simply for the reproduction of print curriculum materials, but for interactive services and content that allows students to explore and link concepts that a single educator would not be able to provide in a classroom setting.

**Box 1.3: Spreading the Word about ICTs and Rural Development**

- In Uganda, there is a network of "community knowledge workers" (CKWs) that use mobile applications to give farmers a broad range of information, including farming practices, market conditions, pest and disease control and weather forecasts.
- A service called "Wizzit" in South Africa became the country's first "mobile bank" for residents without access to banking services, and Celpay's "mobile wallet" initiated an online payment service in the Democratic Republic of Congo and Zambia.
- In May 2003, French Guiana began installing GPS receivers in ultra-light aircraft to help combat the carambola fruit fly.
- Traditional hunters and trackers in Botswana now use GPS trackers to gather information about wildlife. That information goes into a database that can be accessed via a solar-powered PC to provide up-to-date information for game management programmes.

All of these innovative and practical applications of ICTs for rural development – and many more – are documented and described at a single online source: *ICT Update*. Published in English and French by the Technical Centre for Agricultural and Rural Cooperation (CTA) in the Netherlands, *ICT Update* is a bimonthly printed bulletin, a Web-based magazine and an email newsletter – all devoted to African, Caribbean and Pacific countries. Each issue focuses on a theme relevant to the use of ICTs for agricultural or rural development; the 50th issue was published in August 2009.

Source: <http://ictupdate.cta.int/>

The Web becomes an entirely new platform that features individualized learning and research, collaboration among students, mentoring of younger students by older ones, and access to remote research resources.

#### 1.2.1.3 Personal Networking

Social networking has exploded in the last five years and is becoming a global phenomenon (see Box 1.4 below). Sites such as Facebook and Twitter have changed the way people use technology, and have furthered the always-on communication paradigm. In June 2010, Facebook reported 400 million active users. A quarter of these users (100 million) access Facebook through their mobile devices, and Facebook mobile device users are twice as active as PC-based users.<sup>17</sup> As of April 2010, Twitter had approximately 100 million registered users, with 300,000 users signing up per day. Thirty-seven per cent of Twitter's active users employed their phones to "tweet" or publish messages to their followers.<sup>18</sup>

Mobile device users are using their mobiles increasingly within the home. A recent report by the media agency Initiative found that 60 per cent of mobile web usage occurred in the home. The report posits that this represents a sign that consumers desire a constant connection to their networked life.<sup>19</sup> Smartphone adop-

tion will continue to drive this always-on world. According to a Ryvasy Report, smart phones have a 25 per cent penetration rate in the U.S. marketplace; this figure that is expected to hit 50 per cent within two years.<sup>20</sup> As more consumers have access to faster connections and more feature rich smart phones, more users will be able to take their computer-based usage wherever they go.

Along with the pervasive spread of personal networking comes the inclusion of data connectivity as a component in all types of consumer electronics: digital cameras, portable media players, set-top boxes, TVs, DVD players, and gaming systems. This allows almost universal access to content, and the ability to shift and share that content across multiple platforms. Devices can connect to your home network, access or store information in the cloud, and receive software updates to improve their capabilities.

The number of Wi-Fi chips in consumer electronics goods worldwide, for example, jumped 33 per cent from 2008 to 2009 and is expected to continue to grow.<sup>21</sup> Car makers are putting in data connections into its vehicles to provide real-time traffic mapping, web browsing, data messaging, streaming music, and on-demand video.

**Box 1.4: The Year of Social Networking**

In April 2009, social networking reached a new height of media exposure when Hollywood movie star Ashton Kutcher became the first person to reach the 1 million follower mark on the micro-blogging social networking site Twitter. Just a year later, in August 2010, Kutcher had more than 5 million followers, but he had been far surpassed by others in follower counts.

Truly, 2010 has become the year of social networking. Major news media now post "news" based on the twitter feeds of athletes, politicians, and entertainment stars on a daily basis. Moreover, Twitter's reach in 2010 moved beyond the U.S. From June 2009 to June 2010, Twitter use doubled worldwide, with growth largely fueled by use in Latin America, Asia Pacific, and the Middle East-Africa. Twitter penetration in Indonesia and Brazil reached 20 per cent, just edging out the figure in Venezuela (19 per cent) among the over 15 age population.

| Visitation to Twitter.com by Global Regions<br>June 2010 vs. June 2009<br>Total Audience, Age 15+ - Home & Work Locations*<br>Source: comScore Media Metrix |                       |        |          |
|---|-----------------------|--------|----------|
|   | Unique Visitors (000) |        |          |
|   | Jun-09                | Jun-10 | % Change |
| Worldwide   | 44,520                | 92,874 | 109      |
| Latin America   | 3,792                 | 15,377 | 305      |
| Asia Pacific  | 7,324                 | 25,121 | 243      |
| Middle East - Africa  | 2,058                 | 4,987  | 142      |
| Europe  | 10,956                | 22,519 | 106      |
| North America   | 20,390                | 24,870 | 22       |

Meanwhile, Facebook attained more than 500 million active users in 2010, half of whom log on every day. While both Twitter and Facebook started in the U.S., non-U.S. use has greatly expanded; 70 per cent of Facebook users reside outside the U.S. Facebook reported that its users spent more than 700 billion minutes per month on its website, allowing it to surpass Google as the most-visited website in the world in March 2010.

Sources: Oprah, Ashton Kutcher mark Twitter 'turning point', CNN.com, April 18, 2009,

[www.cnn.com/2009/TECH/04/17/ashton.cnn.twitter.battle/](http://www.cnn.com/2009/TECH/04/17/ashton.cnn.twitter.battle/); and - Indonesia, Brazil and Venezuela Lead Global Surge in Twitter Usage, comScore, 11 August, 2010,

[www.comscore.com/Press\\_Events/Press\\_Releases/2010/8/Indonesia\\_Brazil\\_and\\_Venezuela\\_Lead\\_Global\\_Surge\\_in\\_Twitter\\_Usage](http://www.comscore.com/Press_Events/Press_Releases/2010/8/Indonesia_Brazil_and_Venezuela_Lead_Global_Surge_in_Twitter_Usage)

**1.2.1.4 Virtual Business**

Always-on access to the Internet is also revolutionizing the way people and corporations do business. The ability to access broadband networks from literally everywhere through wireless networks is altering the work experience, irrevocably, in the following ways:

- **Tele-Working** – Individual employees no longer have to endure time-consuming, costly, and environmentally damaging commutes over long distances. Using home computers or laptops, they can work from home, from coffee shops, or from pool-side cabanas (if they want to), increasing their ability to mesh home and work life and to increase overall productivity.
- **Virtual Businesses** – Companies no longer need to even maintain offices or facilities, they can simply exist "virtually" in cyberspace, with broadband networks connecting their management and employees. The individual "co-workers" may never even meet each other in person.
- **Online Retailing and Marketing** – Amazon.com popularized the long-standing trend of selling over the Internet, vastly expanding the online "inventory" available to consumers. Some products and services are now marketed, sold, and delivered with a series of mouse clicks (e.g., music downloads, airplane tickets, and hotel bookings).



- **Outsourcing** – Many large corporations (and smaller companies, as well) opt to hire specialized firms to provide functions such as accounting or service support rather than to continue to perform such functions internally; this often results in material cost savings. Many of the "outsourcing" firms that perform these functions provide their services globally, from locations in developing countries or remote areas with lower labor costs.
- **Virtual World Trading** – A spin-off from gaming and personal networking, virtual worlds (e.g., Second Life) are highly articulated online virtual realities that often engender secondary markets. Users can buy and sell real estate, durable goods (e.g., boats and cars) in these online environments using real currency. This has led to virtual "entrepreneurs" that buy and sell fictitious goods and services and collect real money for them from other players.

In addition, of course, much of the world's trade in securities (i.e., stocks, bonds, and derivatives) now takes place online, at the speed of light. The massive volumes of transactions and trade defy quantification. The array of business activity enabled by the Information Society is growing and morphing so rapidly that it has become extremely difficult for consumer-protection or business regulators to monitor or even describe all of the types of transactions. In this "buyer beware" environment, there is an ever-present danger of fraud (see Section 1.4.2, below and the GSR discussion paper entitled, "Addressing Cyberthreats – The Role and Responsibilities of an Effective ICT Regulator") and financial mismanagement. Moreover, because these transactions increasingly involve international data flows, there is no single regulator anywhere on the planet that can act unilaterally to combat abuses or predatory practices.

#### 1.2.1.5 Machines That Talk to Each Other

As if the risk of fraud and other forms of cyber-crime was not alarming enough, the machines are now talking to each other. Telecommunications is increasingly automated, with everyday household appliances, energy grids, and automobiles equipped and linked to relay data, including location information determined through global radio-determination satellites (e.g., GPS). Machines can be monitored from half a world away – by other machines.

Perhaps the most active application of machine-based telecommunications is in the automobile industry.<sup>22</sup> Cars can speed through tollbooths, with fees au-

tomatically deducted and billed to customers' credit card accounts, through radio-frequency identification (RFID) technology. GPS-enabled subscription services allow drivers to obtain directions through on-board navigation systems, receive trouble-shooting diagnostic information during breakdowns, and obtain immediate help when they have an accident. In case of theft, police can recover equipped automobiles through tracking signals. Manufacturers increasingly place sensors on vehicles that warn drivers if they are in danger of hitting a person or object, and some high-end automobiles even use such sensors to help drivers parallel park.

The other major market for automated systems is the home. Machine-to-machine (M2M) technology can be used to remotely monitor and adjust home heating or cooling systems, allowing power companies to cope with peak electrical demand or simply letting homeowners turn up the heat as they return from a ski trip. Home security systems are designed to automatically signal law enforcement if buildings are broken into.

#### 1.2.2 Where the Info Society Isn't

All of these technologies, and the applications that go with them, are increasingly available to consumers. But are they realistically available to everyone, everywhere? The answer to that question, unfortunately, is still "no." Data on the extent of broadband network infrastructure provide clear evidence that the Information Society may be just as stratified as "high society" was some 150 years ago. The prevalence of access to the Internet is not spread equally around the globe.

Internet penetration reached 64 per cent at the end of 2009 in already-developed countries. In developing countries, however, the penetration number lagged behind at just 18 per cent.<sup>23</sup> More to the point, there continues to be both a regional divide and an overall lag in the build-out of fixed and mobile broadband networks. Broadband access – which empowers much of the advanced multimedia and graphically rich content that defines the Information Society – remains largely confined to Internet users in developed countries in 2010. Fixed broadband Internet access penetration reached 23.3 per cent in developed countries, but only 3.5 per cent in developing economies.

There is even greater disparity in mobile broadband penetration. While developed countries are looking ahead to 4G technologies such as LTE-Advanced and WiMAX 802.16(m), many countries still have not widely implemented 3G networks. In developing countries,

mobile broadband penetration achieved a penetration rate of only 3 per cent in 2009.<sup>24</sup>

The implications of stratification in Internet access are twofold. First, the digital divide between countries threatens to widen information and economic disparities between more developed countries (or rapidly developing ones) and economically undeveloped countries. Second, the limited availability of broadband access could easily widen disparities between the economically advantaged and disadvantaged populations *within* countries. Particularly with regard to public services and business opportunities, lack of access to the Information Society may be a critical "glass ceiling" that impedes economic and social mobility. Among the causes of the so-called digital divide are:

- **Lack of access to sufficient infrastructure** – From a lack of last-mile access networks to a paucity of backbone networks and international gateways, many countries lack the required network infrastructure to support the rollout of broadband services and applications.
- **Cost and pricing** – The high cost of building broadband networks, particularly wireline ones, leads to high prices for the services in order to recover these sunk costs. In what becomes a self-defeating cycle, high tariffs suppress demand, which reduces revenues, further discouraging investment in infrastructure. That lack of infrastructure means that there are no economies of scale and scope that would otherwise lower build-out costs. So broadband services remain rare, inaccessible, and prohibitively expensive in many areas of the world.
- **Lack of end-user devices** – The ability to take full advantage of broadband services depends on the user's access to (or possession of) a terminal or handset that can turn 1s and 0s into streaming video and interactive content. Many populations lack reliable or routine access to computers or smart phones. In many countries, the solution likely will be to generate business cases that incorporate subsidies for end users to obtain 3G-equipped mobile handsets as an entry into the broadband universe.
- **Lack of content** – There certainly is no lack of content available on the Internet, as residents of the Information Society know. But for much of the world, what is there is irrelevant, culturally alien, or published in the wrong language. The Internet will give you a recipe for stuffed ptarmigan and a contact to buy pet rocks. But for communities in the developing world, what they need is detailed

health information in Quechua or expanded distance learning opportunities in Assamese.

Any analysis of the Information Society has to include a component of "where it isn't" in addition to "where it is." But in reality, the Information Society is a trans-border phenomenon. In any city in the world, there likely are offices and homes where computers are never turned off just metres away from pedestrians who have never accessed the Internet even once in their lives. The ability to engage and secure information and make contact with others is a global ability, but only when the end user has access to the underlying technologies that form the foundation of the global info-village. The next section examines those technologies as building blocks in that foundation.

## 1.3 Underlying Technologies

From the consumer's perspective, the Information Society does not necessarily appear to be groundbreaking international technological development. It is simply the smart phone or computer program they enjoy using, with all of the attendant applications and services. But to make the consumer's engagement with the Information Society seamless to the individual user, of course, there must be a universe of interconnected networks, servers, earth stations, international gateways, satellites, netbooks, dongles, and handsets, many of which have been developed and marketed only within the past few years. This section reviews the blistering pace of product research and development that has now laid the foundation for an "always on" economy and society.

### 1.3.1 Broadband Network Technologies

At the most foundational level are the packet-switched networks, both wireline and wireless, that provide ever-increasing capacity for massive broadband throughput. These include backhaul and backbone trunking facilities that serve as the major highways or arteries to circulate data. Through peering or transit arrangements, these facilities are interconnected with the access networks of smaller ISPs, which provide the last-mile links through a variety of delivery platforms: telephone networks (through digital subscriber line or DSL), cable TV (through coaxial cable), or fibre-to-the-home (FTTH) networks. Broadband Wireless Access (BWA) networks, such as WiFi, WiMAX or 3G cellular systems, also provide increasingly high speeds that rival or exceed landline speeds.<sup>25</sup>

### 1.3.1.1 NGNs

Next Generation Network (NGN) is a catch-all term for high-speed, packet-switched networks that promise increased uplink and downlink speeds to consumers. When implemented, NGNs will provide enough backbone and backhaul capacity to enable a whole new class of applications, such as three-dimensional (3-D) television, high-definition video conferencing, and virtual-reality type gaming. Fixed broadband NGNs involve deploying new networking techniques over cable TV, DSL, and FTTH systems, greatly boosting capacity and speeds.

On the wireless broadband infrastructure side, flat-IP wireless networking architectures found in WiMAX and the 3GPP Long-Term Evolution (LTE) technology are expected to offer mobile and portable download speeds that rival those of fixed broadband networks, allowing similar kinds of broadband applications, including mobile television and video telephony.

The forecasted growth of Internet traffic, fueled by many of the Information Society services mentioned in Section 1.2, is relentlessly driving technology development. Internet capacity use is predicted to grow by a

factor of four from 2009 to 2014, approaching 64 *exabytes* a month. Video content is expected to comprise over 91 per cent of that total by 2014 (see Figure 1.1 below).<sup>26</sup> NGN technologies that provide backbone connectivity are advancing to provide the necessary capacity to last mile networks to meet this demand. Equipment manufacturers and carriers are deploying 40 GB/s architectures, and manufacturers are readying 100 GB/s solutions using fibre or Ethernet technologies.<sup>27</sup> Terabit networking solutions are being considering for the next technology iterations. Innovations at the Internet backbone and in last-mile network technologies are poised to deliver new higher speeds and meet future Internet traffic demands.

### 1.3.1.2 Wireline Access Platforms

Advances in cable modem and FTTH networks promise to dramatically increase the speeds businesses and consumers will have to access Internet content and applications. The cable TV industry is utilizing DOCSIS 3.0 to offer theoretical download speeds of up to 160 Mbit/s and upload speeds of 120 Mbit/s.<sup>28</sup> Some U.S. cable operators have already begun offering speeds in excess of 100 Mbit/s to large portions of their coverage areas.<sup>29</sup>

**Figure 1.1: Stairway to (Digital) Heaven: The Broadband Usage Forecast**



Note: "Managed IP" refers to enterprise-level private network services.

Source: Cisco, VNI, June 2010.



In Japan and the UK, cable operators have also deployed DOCSIS 3.0. Japan's Cablenet is offering a 160 Mbit/s service tier,<sup>30</sup> and the UK's Virgin Media is piloting a 200 Mbit/s tier, with an eye toward offering a 400 Mbit/s tier in the future.<sup>31</sup>

Within the telephony industry, FTTH networks are the current next-generation wireline alternative to (coaxial) cable-based technologies. Fibre can offer very high bandwidth to consumers and businesses. Some FTTH providers are delivering 1 GB/s symmetrical service (both uplink/downlink) to residential customers in Hong Kong, China; Republic of Korea; Germany; Australia; Portugal; Amsterdam; Japan; Sweden; and the U.S.<sup>32</sup> The Organization for Economic Cooperation and Development (OECD) found that in October 2009, the fastest speeds advertised by the incumbent telcos, using fibre, were in Portugal and Slovakia (see Figure 1.2).

According to OECD figures, at the end of 2009, 54 per cent of Japanese broadband service subscribers were on fibre networks, with Republic of Korea close behind at 49 per cent. The FTTH Council, on the other

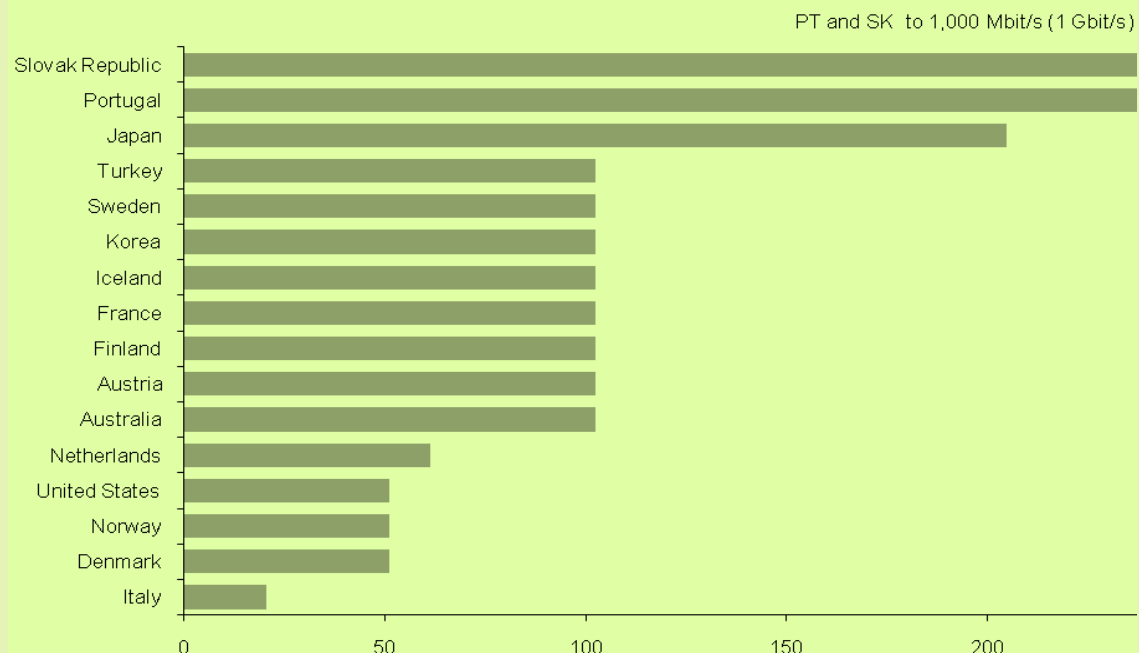
hand, found that Republic of Korea was the world leader, with more than 50 per cent of its households subscribing to high-speed access through FTTH broadband connections. Japan was second globally, with more than 34 per cent penetration, while Hong Kong, China, was only slightly behind Japan in third place.

### 1.3.1.3 Broadband Mobile Services – 3G and 4G

Wireless access networks based on so-called 3G and 4G technologies are expanding the availability of the Internet to more people, providing the flexibility to take one's broadband connection anywhere. High Speed Packet Access (HSPA) networks – commonly known as "3.5G" networks – have proliferated in many countries. The Global Mobile Suppliers Association (GSA) released statistics in June 2010 identifying 353 HSPA operators in 147 countries, with over 100 more planned by the end of 2010.<sup>33</sup> Current HSPA networks provide peak downlink speeds of 21 Mbit/s, with future iterations of the technology able to achieve peak download speeds up to 84 Mbit/s.<sup>34</sup>

**Figure 1.2: Off to the Races: OECD Countries Add Fibre Throughput**

Fastest advertised broadband speeds, using fibre, Kbit/s, Oct 2009

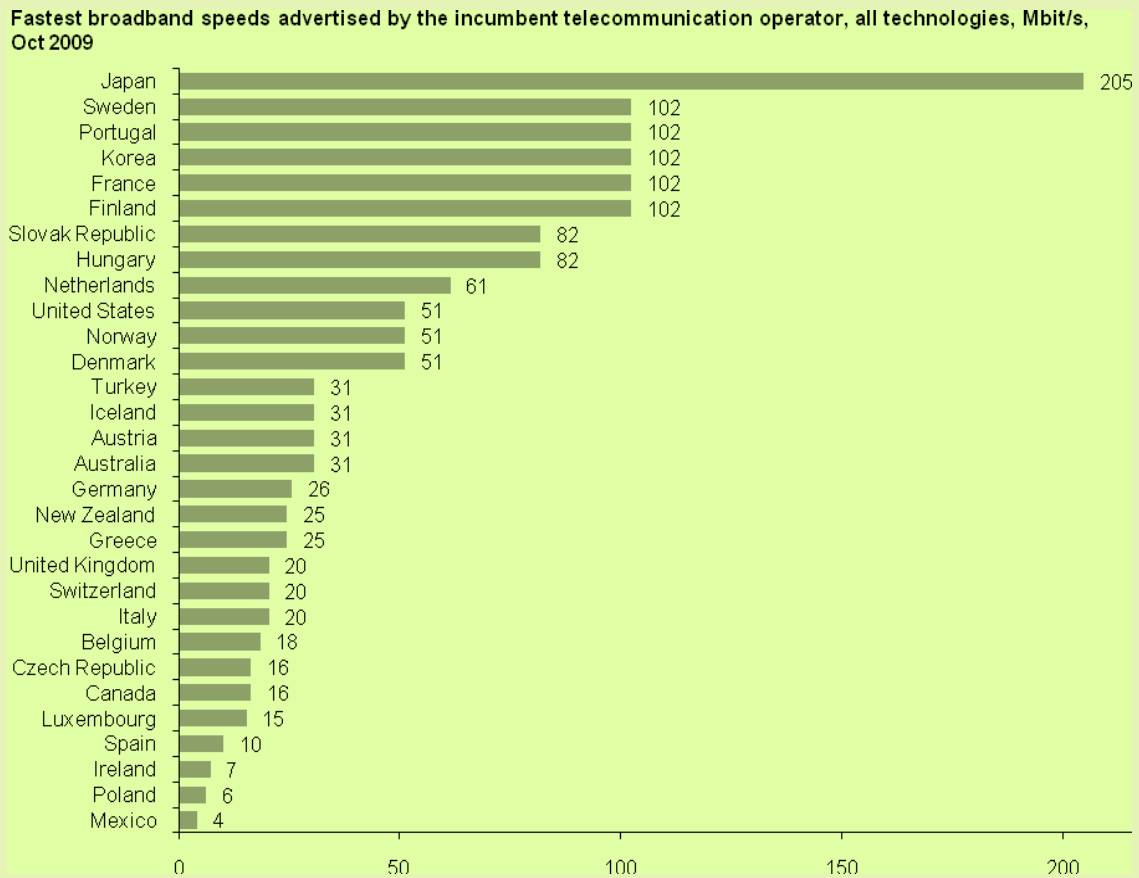


Source: OECD

Note: See the OECD broadband portal for information on data sources and notes.

Note: The offers used to calculate the average include all combinations of single, double and triple-play offers in the survey. This is because some top-speed broadband subscriptions only are available as part of a package.

[www.oecd.org/sti/ict/broadband](http://www.oecd.org/sti/ict/broadband)

**Figure 1.3: Keeping Up with Japan: Broadband Speeds Using All Technologies**

*Note: Includes fibre-to-the-home (FTTH) and fibre-to-the-building (FTTB or apartment LAN) connections. Some countries may have fibre but have not reported figures so they are not included in the chart. See the OECD broadband portal for information on data sources and notes.*

*Source: OECD, OECD Broadband statistics [oecd.org/sti/ict/broadband]*

Meanwhile, commercial WiMAX networks already are deployed in more than 147 countries, covering 620 million people.<sup>35</sup> LTE, a technology that often competes with WiMAX, also enjoys widespread adoption by major carriers, although deployment and operation of networks is well behind WiMAX. At mid-2010, LTE networks were operating in Norway and Sweden, but there were 80 more LTE network commitments in 33 countries.<sup>36</sup>

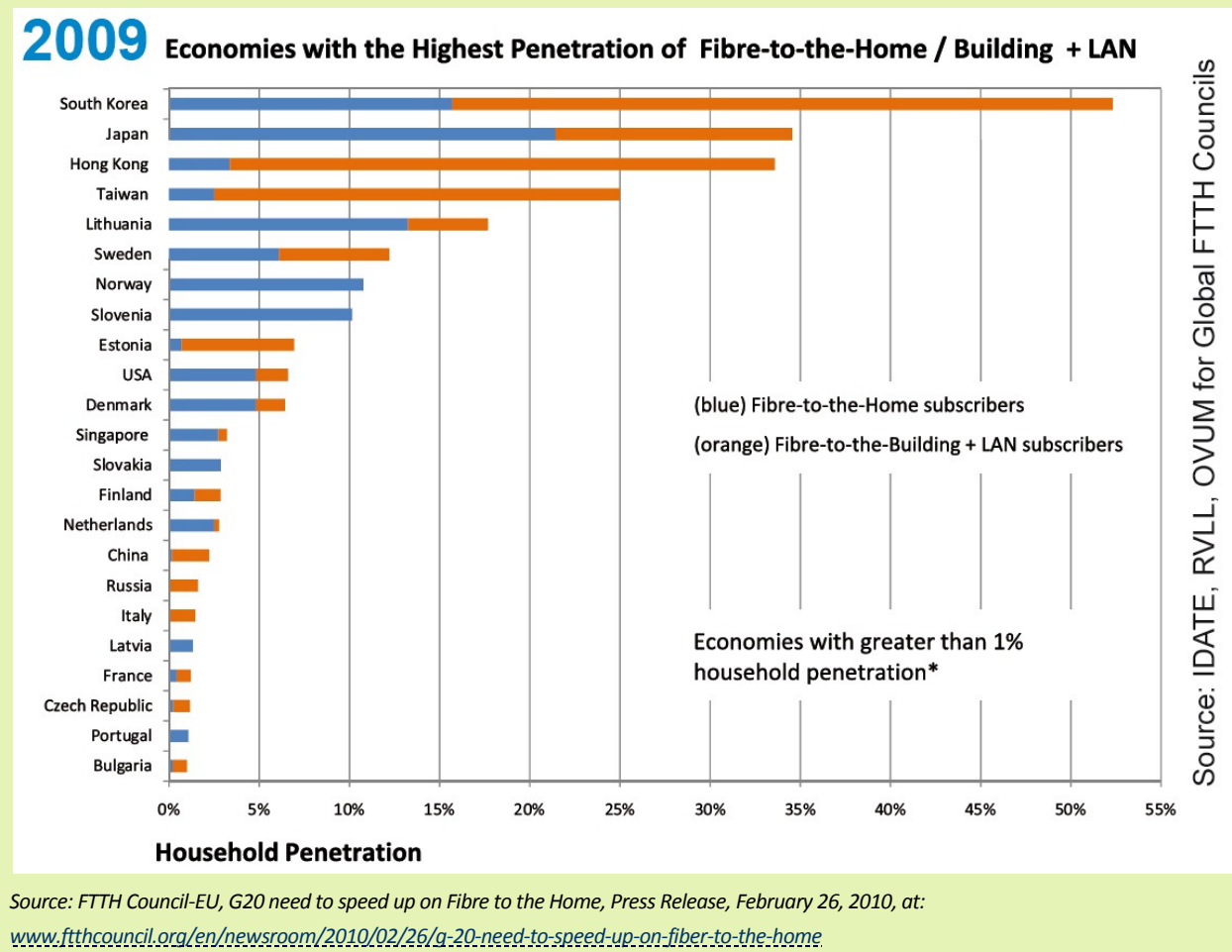
Backers of both WiMAX and LTE networking technologies have applied for ITU's IMT-Advanced certification, which requires 100 Mbit/s mobile download and 1 GB/s fixed download speeds. WiMAX-Advanced and LTE-Advanced, as they will be known, are expected to be approved and could be deployed as early as 2012.<sup>37</sup>

It is these IMT-Advanced systems that most industry observers now consider true 4G technologies.

### 1.3.2 Devices

Notwithstanding the download speeds available to consumers, few residents of the Information Society are closely counting these speeds by the hour or minute. What they are looking at – and mesmerized by – are the gadgets. Whether they are I-phones, G-phones, I-pads or I-pods – or laptops, desktops, netbooks, or dongles – the devices are the keys to the Internet. They provide the intelligence for otherwise largely bent-pipe packet-switched networks. And it is really these end user devices that offer the online experience.

Figure 1.4: Global FTTH Council Ranking of FTTH Penetration Rates



Source: FTTH Council-EU, G20 need to speed up on Fibre to the Home, Press Release, February 26, 2010, at: [www.ftthcouncil.org/en/newsroom/2010/02/26/g-20-need-to-speed-up-on-fiber-to-the-home](http://www.ftthcouncil.org/en/newsroom/2010/02/26/g-20-need-to-speed-up-on-fiber-to-the-home)

Faster networks have given rise to powerful new devices in many forms, ranging from smart phones such as Apple Inc.'s iPhone and Google-powered Android phones, to portable computing devices such as netbooks and smartbooks, to tablet devices such as Apple's iPad, to single purpose devices such as Amazon's Kindle. Advances in chip design, manufacturing, and cost-reduction have enabled a variety of devices that bring computing to larger segments of the population.

### 1.3.2.1 Smart Phones Are Driving Demand

Smart phones and netbooks are driving demand for mobile broadband and WiFi networks. In Asia, smart phones accounted for one-third of handset sales in the first quarter of 2010 and this trend was expected to continue.<sup>38</sup> In other parts of the world, similar rapid adoption of smart phone devices is expected. In Europe, Gartner Group found that 28 per cent of phones sold in 2009 were smart phones. It predicted that by 2012, the

percentage of smart phones sold would increase to 70 per cent of all phones sold.<sup>39</sup>

These devices are gradually becoming the primary means for people to get on-line, as consumers cut the cord and use a wireless broadband connection to connect to the Internet. This trend holds much promise for developing countries, where many consumers cannot afford a laptop or personal computer or have no access to fixed line broadband services. Smart phones operating on a mobile broadband network can provide access to the Internet at a low cost, particularly if operators provide handset subsidies to "seed" the growing broadband wireless market.

A recent study found that wireless broadband service using HSPA or LTE provided connectivity to 17.3 per cent of PCs in Europe.<sup>40</sup> Wireless technology can be the Internet on-ramp for billions around the world, particularly because more people are already using mobile

phones as their primary or sole voice communications device.

### 1.3.2.2 Device Convergence

In the wake of the digital revolution, the most substitutable part of the communications value chain may well be the device used to generate the digital transmission. We live in an era when gaming consoles are also computers and when computers double as telephones.

In 2005, South Korea became the first country in the world where mobile phones could receive digital television signals. South Koreans had bought 20 million handsets by the second quarter of 2009 – double the number from the first quarter of 2008 and 11 times the number of handsets sold when mobile TV was first launched.<sup>41</sup> In South Korea, free-to-air mobile TV is a five-year-old fact of life. According to the country's broadcasters, 27 million people — 56 per cent of the population — watch regularly.<sup>42</sup> While South Koreans are the world leaders in mobile TV viewing, the technology is also catching on in China, Southeast Asia, India, Africa, and Latin America, where 80 million people now have cell phones that can receive largely analog TV broadcasts.<sup>43</sup>

In the U.S., over-the-air broadcasters are starting to trial free mobile TV programming. Broadcasters plan to launch regular service in the 2011-2012 timeframe. Plans for free, ad-supported mobile service will be first to be made available. Paid premium content is expected to be offered in the future.<sup>44</sup>

### 1.3.3 There's An App for That

So, you want to use your phone as a compass or a personal fireplace? There's an "app" for that: a software application that usually can be downloaded in minutes, purchased and paid for online, and stored on the mobile device for future use (or, often, not). (See Box 1.5 below.)

Mobile apps and mobile app stores are a relatively new phenomenon. In 2007, Apple introduced its iPhone and kicked off the mobile app revolution with its App Store, which made it easy for consumers to find and install applications. The smart phone and its accompanying app-store "ecosystem" showcases the power and flexibility that advanced handsets can offer in tandem with high-speed mobile data networks. As of June 2010, with more than 2 billion downloads and 225,000 applications in its App Store, Apple still led the way.<sup>45</sup> But Google, with its Android smart phone operating system and competing Android Market for compatible applications, was posting dramatic growth over the two years since the first Android device was introduced in 2008. Google's Android Market has sold more than 250 million downloads,<sup>46</sup> and as of June 2010 had more than 65,000 apps available. Meanwhile, additional app stores from manufacturers and operators were being developed, increasing the accessibility of features for smart phone users.<sup>47</sup>

Mobile applications provide a targeted user experience that can simplify access to a whole slew of online services, such as social networking, mobile banking, entertainment, sports, and health information. These apps can greatly enhance and ease people's access to an unlimited number of services.

#### Box 1.5: Apps-a-Go-Go: The World of Wild and Wondrous Applications

The explosion of smart phones and "app stores" has brought a wide range of mobile applications to the market, driving customers' fascination with their new, high-tech handsets. Many of these apps make use of smart phone cameras, GPS location capability, and Internet access, resulting in new features that many consumers find irresistibly useful. Other apps, while still seemingly irresistible, rank a bit lower on the usefulness scale. Many apps could best be described as niche applications.

For example, star navigation map apps allow would-be astronomers to simply point their phones to the night sky and see on their mobile screens the names of the constellations they are viewing. Augmented-reality apps, meanwhile, allow users to see "overlay" information relating to restaurants, movie theatres, and other public places caught in the smart phone's camera view. One need only point the mobile phone to unspool real estate listings, menus, parking lot prices, and other data.

Of course, not all apps reach that mind-expanding level. As with any new technology, some apps are of dubious social benefit or even downright silly. One prime example is a popular app called "iFart," which produces noises of a decidedly impolite nature. Other apps provide visual and audio sound effects mimicking light sabers, cigarette lighters, firearms, and even the vuvuzela of South African World Cup fame. While the history of smart phone apps is still in its early stages, only time will tell which apps are true trailblazers and which ones will end up in the dustbin of history.

Source: Authors.

### 1.3.3.1 It Knows Where You Are

The world is still seeing the early days of location-based apps, but according to new data from Skyhook, there are now more than 6,000 location-based iPhone apps, 900 Android apps, and 300 BlackBerry apps.<sup>48</sup> These location-based applications range from social networking ones like Twitter, Foursquare, or Google Buzz to child tracking to gaming, to targeted, location-based advertising.<sup>49</sup> *Augmented reality* applications are also generating excitement. These applications use the smart phone's location, mapping, and/or camera functionalities to provide an overlay that gives users data about and enhanced views of their surroundings.

Privacy concerns are one of the growing social harms associated with these applications. The greatest fears of using location-based apps are (1) revealing where one's home is, and (2) facilitating stalking behaviours, according to Australian respondents to one survey.<sup>50</sup> A study by the U.S. Carnegie Mellon University revealed that people also worried about being tracked by the government and do not want to be annoyed by receiving ads based on their exact locations.<sup>51</sup> One website, dubbed "Please Rob Me," highlighted the potential risks of sharing location-based data by aggregating publicly shared check-ins of Foursquare users and informing others of the locations of these users. While the site stopped its service after a short while, it raised awareness of the privacy risks associated with location-aware apps.<sup>52</sup>

### 1.3.3.2 Push and Pull Apps

One set of mobile apps push information from a server to a mobile device. Another set of mobile apps are initiated by the mobile device (by user interaction or automated scheduler) and pull information to it from the web.<sup>53</sup> Smart phones take advantage of both types of applications. Push apps require little user intervention but may be viewed as more invasive, as the user does not control when they receive app updates. To the user, however, the difference between the two types of app update is often hard to differentiate. Some email programs like Blackberry and Gmail on the Android OS provide push service, but these devices also are able to use pull technology via POP<sup>54</sup> to download emails to the device.

### 1.3.4 Tariff Trends

We have established that all the underlying parts of the Information Society are falling into place: we have the high-speed, large-capacity backbones, the wireline and wireless broadband access networks, gadgets and gizmos, the features and applications to make them sing, and advanced services like mobile TV to provide content. Just how are we going to pay for all this?

Leaving aside the question of affordability, what pricing and metering mechanisms make the most sense? In many areas, the easiest and simplest way to promote take-up of service has been to offer non-usage-sensitive, flat-rated pricing. Customers would pay (sometimes) a service-initiation fee, followed by unlimited usage on a monthly payment basis.

This can lead, however, to massive imbalances in data downloads by a few customers, straining the capacity of even a broadband network. According to U.S. operator AT&T's head of consumer services, Ralph de la Vega, about 3 per cent of smart phone users are consuming about 40 per cent of AT&T's network capacity (see Box 1.6).<sup>55</sup> iPhone users on the AT&T network are usually targeted as the culprits. As a result, the U.S. mobile service market has begun to see tiered wireless data plans. For example, AT&T's DataPlus service provides 200 MB for USD 15 per month, and its DataPro offering provides 2 GB for USD 25.

In the first quarter of 2010, Nielsen Corp analyzed 60,000 mobile bills in the U.S. and discovered that the average smart phone mobile data user consumed approximately 300 MB per month.<sup>56</sup>

Metered data pricing that offers lower price points may be fairer to consumers.<sup>57</sup> UK telecom operator O2 has also moved away from unlimited data plans. Wireless operators in Sweden, however, are going the other way, moving from tiered plans to unlimited usage plans. 3 Sweden and Tele2 have removed the data caps on their most expensive plans, noting the reduction in cost of adding additional capacity.<sup>58</sup> Another potential driver for metered data pricing is to provide less-expensive options to entice mobile customers to purchase a data plan.

**Box 1.6: U.S. iPhone Capacity Issues – a Sign of Things To Come?**

In 2009, Apple iPhone users in the U.S. cities of San Francisco and New York experienced a love-hate relationship with their devices. They loved their slick, user friendly, state-of-the-art mobiles, but many of them grew increasingly frustrated with their periodic inability to use them, due to capacity issues experienced by AT&T, the exclusive U.S. provider of iPhone service.

While the operator has invested billions of U.S. dollars in upgrading and improving its network, the capacity problems illustrate the huge demand new smart phones will place on wireless networks. Smart phone users consume five times the amount of data capacity that standard mobile phone users do. As more users buy and use smart phones, operators are struggling to keep up with the huge data capacity demand, and they are attacking the problem on multiple fronts.

One approach is to address their network capabilities. Operators are upgrading copper backhaul connections to fibre, splitting cell sites, and adding newer towers in densely populated areas. They are also using additional spectrum resources to offer greater capacity, investing in WiFi networks, and encouraging users to purchase femtocell devices to off-load traffic from the operator's network onto the consumers' facilities.

Meanwhile, operators have worked with hardware and software manufacturers to optimize how devices such as the iPhone and bandwidth-intensive apps such as Internet TV and radio streaming use the network. Operators have also introduced different tariff structures, charging higher prices to customers with high data-rate plans or penalizing customers that exceed certain data allotments.

Operators are also looking for more spectrum allocations. In the U.S. and Europe, operators have campaigned for more harmonized spectrum, preferably in contiguous blocks, for next-generation wireless technologies (LTE and WiMAX). In addition to more spectrum licensing, increasing the availability of unlicensed spectrum might allow for greater opportunities to off-load operator traffic onto alternate networks. Regulators may also be asked to look at opening access to incumbents' fibre networks to provide critical backhaul needed to support mobile data traffic.

*Source: Authors.*

On the fixed-line side, U.S. cable operator Comcast has been experimenting with metering data usage since 2008. It has instituted a 250 GB combined upstream/downstream cap per month. The median Comcast customer averages 2-4 GB/ month and fewer than 1 per cent come close to the 250 GB cap, according to Comcast officials.<sup>59</sup> Internationally, fixed-line operators have been more comfortable instituting bandwidth caps and have not faced consumer backlash for their actions. Some critics argue, however, that fixed-line network operators are eager to impose caps to ensure that their own proprietary video offerings are not impacted if customers choose to drop those subscriptions and rely on Internet-delivered video programming.<sup>60</sup>

### 1.4 Impact on Everyday Lives

It is one thing to say that governments, businesses, and organizations are using new networking and personal computing technologies more than ever before. The real question is how this may be changing individual lifestyles and lives. The news media in many developed countries are now sharply attuned to issues of how the saturation of "always on" media may be affecting society. Along with clear advantages, there is growing concern that some people may have become so ad-

dicted to constant connectedness that it alters their relationships and capabilities – even their thinking patterns – in the "real world". In Canada, for example, a number of provinces have enacted laws that prohibit drivers from texting while they are driving and from talking on mobiles other than hands-free devices. Similarly, in the United States, many state legislatures have introduced similar legislation.

Recently published books have posed questions about whether:

- Increased telecommunication connectedness has actually made us less social in face-to-face settings;
- Total immersion in online activities may be a form of escapism that amounts to an addiction;
- Instead of liberating us, online services actually burden us with accumulated passwords, jargon, and time-intensive monitoring of multiple networking sites (see Box 1.7, "Is It Okay to Unplug?"); and

Our children experience too much unfiltered online media and not enough outdoor activities that used to characterize childhood in earlier years.



**Box 1.7: Is It OK to Unplug?**

In the Information Society, there is no end to the opportunities to get online, through smart phones, netbooks, laptops, desktops, game consoles, iPads, social networking sites, and so on. All of these devices and applications are meant to make life easier, but is there a point where it just becomes a burden keeping up with all of it? Do we work for our machines? Is it OK to unplug once in a while?

Increasing buzz in the media points to a sociological trend in the making: instead of immersing themselves in the always-on Internet universe, some people are turning that into the *almost* always-on revolution. In other words, they are making a point of actually turning their electronics *off* occasionally, just to de-stress and re-engage with family and friends in person. Some call it the "digital sabbath." The idea is to take a day, or a weekend, to just rest from the burden of answering texts, posting Facebook entries and tweeting, if only to put all the information into perspective.

William Powers, the author of a book that explores new media overload, tells of standing on a New York City corner with a half-dozen other people, all of them were engaged in pecking on their smart phones. Here, amidst one of the liveliest, most energized cities in the world, people were tuned out: there, but not there. Powers' book, entitled *Hamlet's Blackberry: A Practical Philosophy for Building a Good Life in the Digital Age*, tries to help individuals obsessed with digital connectivity re-draw a balance between life online and life in the actual world around them.

That advice may have come just in time. In a front page article in February 2010, a newspaper in Washington, DC, related, among other things, reports from marriage counselors in the U.S. that online behaviour is actually threatening marriages in many cases. That included one instance in which the husband reportedly began surfing the Web on his smart phone – in the middle of the marriage act itself!

Sources: National Public Radio, "Hamlet's Blackberry: To Surf or Not To Surf," 20 July 2010, downloaded from

[www.npr.org/templates/story/story.php?storyId=128364111#128364178](http://www.npr.org/templates/story/story.php?storyId=128364111#128364178); and Rosenwald, Michael, "Obsessed with Smartphones, Oblivious to the Here and Now," *Washington Post*, 22 February, 2010.

Doubtless, these lifestyle complaints will seem over-wrought to most individuals who are seeking broadband access to improve their livelihoods, educations, and health. But consider this a fair warning: when the broadband faucet opens, it can often turn into a torrent of unwanted and seemingly uncontrolled content, as well as fraud, invasion of privacy, computer viruses, and other unintended consequences. So, for individuals with broadband access to the world, and for the regulators who are called upon to protect them, the Information Society has truly become an environment of "the good, the bad, and the baffling." This section explores this multi-faceted nature of online culture – a culture that regulators must decide whether, and how, to monitor and regulate.

#### 1.4.1 The Good

There is no doubt that broadband networks, smart phones, computers, and the Internet together provide enormous advances in social and personal welfare. For most observers, the positive aspects of the Information Society more than outweigh the drawbacks. To take the example of the most basic online applications, since the early 1990s, email and Web browsing have made personal communications and basic research infinitely more accessible, affordable, productive and common. In many primary schools (where computers and broad-

band are available) children as young as 5 or 6 are now being taught how to gather information over the World Wide Web and how to present it in graphic and written formats.

Social networking and multimedia content now enrich the online experience of millions of people. The very act of shopping for household items has become computerized, as people go to Internet websites such as craigslist to seek out bargains. And yes, even basic human relationships have gone cyber with online dating sites and chat rooms. In fact, one of the salient aspects of the Information Society is that it can touch every facet of a person's life, depending on how deeply that individual chooses to immerse himself or herself in the online world.

Perhaps the best way to envision the benefits of the Information Society is to define them in terms of how they affect individuals' lives. The benefits could be categorized as:

- Citizenship;
- Consumer Empowerment;
- Communitarian Involvement; and
- Personal Welfare.

### 1.4.1.1 Citizenship

The growth of e-government services around the world has been accompanied by corresponding gains in openness and transparency of government activities. Government agencies have increasingly begun to post proposals and decisions on their websites, in the process inviting public consultation and public awareness of their activities. Individual citizens often now expect to see notifications of meetings, the texts of judicial and administrative decisions, and other government documents online. Governments have moved to online publication, in many cases, to save printing and distribution costs.

Along with access to government, citizens are obtaining enhanced, and often direct, modes of communication with elected officials. Broadband services can allow elected representatives to host online chat sessions and "pod-casts" that give them more chance to solicit opinions, explain their positions and communicate the progress of legislation. In some countries, legislators provide phone numbers and email addresses on their official web pages, and in some cases, there are automatic links that allow constituents to draft and

send messages directly through those websites. The combination of increased information and greater accessibility to government officials provides everyday citizens with unprecedented opportunities to participate in the governance and civic life of their countries.

Moreover, that increased availability and access carries over into political campaigns and movements (see Box 1.8 below). With access to texting, email, and the Internet, individuals can contribute money and time to causes and political campaigns more easily. Political candidates increasingly respond to these opportunities by starting blogs, sending out Twitter "tweets", and maintaining Facebook pages. The combination of mapping software and broadband access, for example, allows visitors to a campaign web page to call up a map of their geographic area and click on various locations to see descriptions and schedules of upcoming campaign events in those locations. The effect of broadband technologies on political activity is (1) to decentralize it, (2) to make it more accessible, often to previously un-involved individuals, and (3) to capitalize on the energy generated by rapidly snowballing media momentum.

#### Box 1.8: The Information Society: Not Politics As Usual

As access to the Internet spreads and social networks become more prevalent, politics has changed, as well. Politicians and the public alike are using the new online tools to advance their views on governance.

Heru Sutardi, commissioner of Indonesia's Telecommunications Regulatory Authority, has recognized the growing importance of social networks, calling them collectively Indonesia's "fifth estate", after the legislature, the executive branch, the judiciary and the traditional media. Sutardi noted how social networking sites are changing how Indonesians interact with their political leaders and influence policymakers. For example, at the end of 2009, a Facebook group advocated the release of two leaders of Indonesia's Corruption Eradication Commission (KPK). Indonesia is not the only country seeing the growing influence of social networking. In Thailand, Facebook and other sites have become a hotbed of political activism, providing a way for groups to identify political opponents (in one case, targeting them by name).

The increasing influence of social networking sites on political campaigns was a topic of discussion in 2010. In the Republic of Korea, the National Election Commission (NEC) restricted the use of Twitter three months prior to elections held on 2 June 2010. The NEC applied the same treatment that it applies to campaign advertising emails, citing an election law that bans distribution of promotional material 180 days prior to the election. The New Progressive Party (NPP), whose candidate was one of the most followed politicians on Twitter, was quick to issue a statement against the prohibition, providing evidence of the growing influence of the medium.

Citizen mobilization and political campaigning are not the only examples of the use of social networking. Existing heads of government can use the technology, as well. In 2010, Venezuelan President Hugo Chavez joined Twitter, and by August of 2010 he had more than 720,000 followers. Chavez encouraged Venezuelan citizens to tweet him with their concerns. His use of the medium has given Chavez's popularity a boost and has become a significant communication tool for his administration.

Sources: Robin Hicks, *SOCIAL NETWORKS: INDONESIA'S FIFTH ESTATE?*, *futuregov*, 22 July 2010, [www.futuregov.asia/articles/2010/jul/22/social-networks-indonesias-fifth-estate/](http://www.futuregov.asia/articles/2010/jul/22/social-networks-indonesias-fifth-estate/);

Simon Montlake, *Thailand's red shirts and yellow shirts battle it out on Facebook*, *Christian Science Monitor*, 24 May 2010, [www.csmonitor.com/World/Asia-Pacific/2010/0524/Thailand-s-red-shirts-and-yellow-shirts-battle-it-out-on-Facebook](http://www.csmonitor.com/World/Asia-Pacific/2010/0524/Thailand-s-red-shirts-and-yellow-shirts-battle-it-out-on-Facebook); Kim Tong-hyung, *Crackdown on Twitter Brings Criticism of NEC*, *The Korea Times*, 16 February 2010, [www.koreatimes.co.kr/www/news/biz/2010/02/123\\_60930.html](http://www.koreatimes.co.kr/www/news/biz/2010/02/123_60930.html); Rory Carroll, *Hugo Chávez's Twitter habit proves a popular success*, *The Guardian*, 10 August 2010, [www.guardian.co.uk/world/2010/aug/10/hugo-chavez-twitter-venezuela](http://www.guardian.co.uk/world/2010/aug/10/hugo-chavez-twitter-venezuela).



Meanwhile, the Information Society is also reinventing the old styles of journalism and commentary. The "press" of yesteryear is now a wide-open universe of blogs, online news sites, YouTube clips, and cable TV commentary, all of which is accelerated into a nearly instantaneous news cycle. In the Information Society, the medium is now *faster* than the message, and the Internet delivers the news almost as rapidly as it happens. Again, as with political activity, the impact of always-on media upon journalism has been hard-hitting and far-reaching. Access to the media has been revolutionized because anyone with a computer (or cell phone) can now "broadcast" or "report" events simply by texting pictures or uploading content to the Internet. For good or ill, the new media environment has rapidly decentralized journalism and turned every computer into a newsroom.

#### 1.4.1.2 Consumer Empowerment

Much attention has been given to how the Internet empowers companies to access markets they could never before reach. This works two ways. Consumers now have the access and the reach they need to purchase unique, high-value, and affordable goods and services literally anywhere in the world. Broadband connections allow buyers to see what they are buying (often, with views from multiple angles), ask questions or input the various options (color, size, functionality, etc.), and then, after providing payment authorization, simply click a button and have that product delivered to their homes. Online shopping has become so ubiquitous that in many countries it has almost entirely replaced human contact in several major industries, including air travel, entertainment (i.e., the sale of tickets for concerts or sporting events), and hotel accommodations. When online purchasing works (and it increasingly does work), the benefits are manifest:

- The ability to purchase goods and services not available in one's immediate area;
- Savings in time and energy (i.e., petrol) by avoiding having to travel to find, purchase, and transport an item to one's home;<sup>61</sup>
- Access to multiple choices of suppliers, stimulating competition, lowering prices, and causing suppliers to be more efficient; and
- Access to an enriched quality and variety of goods and services in national or worldwide markets.

There are, however, drawbacks and uncertainties associated with online consumerism, which will be addressed in detail in Section 1.4.2.

#### 1.4.1.3 Communitarian Involvement

As with increased availability and participation in government and political life, broadband Internet access provides new avenues for organizing groups to fulfill community needs and individual interests. Charity groups, sports leagues, literary clubs, youth groups, religious gatherings: any routine activity in a community can be captured and organized on a website. A youth football club, for example, can announce a meeting to plan a tour in a nearby region, post practice schedules, itineraries and permission forms, and then post pictures and videos of the matches once the tour is over. With web hosting services now widely available and increasing numbers of individuals having learned how to maintain content, there are fewer and fewer limits to the creativity and content that community groups bring to their online sites.

Moreover, "communities" can be regional, national or even global. For example, support groups for individuals stricken with very rare diseases can communicate with each other and spread information on treatment options being explored in different parts of the world. Émigrés from a single town in the "old country" can continue to share news, pictures, videos, and conversations from places as diverse as Chile, Australia, Zimbabwe, and Canada. In the process, they can continue to learn about issues and problems in their hometown, and provide support to help their friends and relatives still living there.

Social networking sites are frequently used, as another example, to organize reunions of extended families and school classmates. The broad availability and public awareness of such services as Facebook have made it possible to re-establish links with individuals that may have been "lost" or out of communication for years.

Moreover, the ability to provide a cyber "home" site for individuals with like interests and backgrounds can serve as an incubator for the preservation of rare and threatened languages, cultural traditions, arts, trades, and musical styles. It may be ironic that a 21st century technology can help resurrect an ancient art form, but the power of broadband interconnection is that individuals accessing a website can download audio and video and participate in streaming of live performances and post their own content. Experts, aficionados, and other performers can then interact with it. The result is living cultural experience, not a static, dead artifact.

#### 1.4.1.4 Personal Welfare

The improvements to life described in the previous sub-sections are, of course, apt to bring more happiness and fulfillment to individual lives. But in several direct ways, the Information Society provides more opportunity for enhanced personal welfare than perhaps has ever been possible before.

Through tele-medicine and eHealth services, individuals can gain access to services and medical expertise that would otherwise not have been available to them. Moreover, hospitals, doctors' practices, and other facilities can employ information technologies to digitize medical records, so that they can be rapidly transferred or called up for use by multiple professionals. This makes the practice of medicine more efficient and could improve patient outcomes. It allows greater sharing of patient data to compare symptoms and conditions, which could potentially improve medical research and lead to advances in treatment.

In addition, individuals will gain access through broadband services to online education and training programmes, books, and libraries. These resources can expand personal knowledge and lead to better employment and career opportunities.

Moreover, broadband services can put individuals in touch with personal and family counseling services, addiction treatment options, and other social support mechanisms. These services can help not only the individual seeking assistance, but members of that person's family and community, as well.

Perhaps the most recognized area of personal benefit is the ability to communicate easily, through voice and texting, with loved ones, friends and co-workers. Always-on communications means that people can keep up with each others' activities, locations, and even feelings. The fact that texting, and now social networking, are major drivers of the Information Society technologies, is a testament to how quickly they meet individuals' needs and desires for interpersonal connectedness.

Finally, people can enhance their quality of life through access to entertainment, online books, music, and the arts. The Information Society is also inherently a portal to culture and diversion, including movies, popular music, and online games. The latter can include

alternate cyber "universes" where "avatars" can trade, build, play, and live vicarious lives.

So rich are the varied opportunities for online experience that some observers question whether the totality of that experience is altering perceptions of reality. (See Section 1.4.3 below.) There is no doubt, however, that access to the Information Society can bring real-life improvements in health, education, career development, and other aspects of personal life.

#### 1.4.2 The Bad

With all of the avenues open for cultural, political, community, and personal development, it is not hard to see why the Information Society is a popular destination for policy-makers and individuals all over the world. But a funny thing happened on the way to the "global village": we picked up some unwanted fellow travelers. As with every technological and sociological revolution, this one has had some unintended consequences (see Box 1.9). This section explores the clearly detrimental aspects of the Information Society: new facets of living that perhaps nobody expected and certainly nobody wants. These include:

- Computer malware and botnets that sneak in through the Internet and hijack control of our computers;
- Identity theft, fraud and invasion of our privacy;
- Content inappropriate for minors or offensive to community standards;
- Online "predators" seeking to establish contacts with potential victims of their crimes; and
- Unintended environmental and health impacts from discarded computer and cell phone components.

In mild form (i.e., email "spam" or even a relatively harmless computer virus), some of these negative aspects of cyber-life are merely nuisances. On the other extreme, they can be tragic and even fatal for children and adults who are not able to detect fraud or protect themselves from criminals who hide behind the anonymity of the Internet. These are the threats that pose a challenge to governments and regulators. How can governments and regulators ensure the benefits of the Information Society, outlined in Section 1.4.1, while still protecting consumers, particularly the most vulnerable of individuals, from harm?

**Box 1.9: The Internet: Innocence Lost?**

In May 2010, Sydney, Australia was shocked by the report of an 18-year-old who was lured to her death by an Internet predator who allegedly set up a false Facebook site, in which he claimed to work for an animal welfare group. Following her dream of working with animals, the young woman agreed to meet the man in a rural area to help "rescue injured animals." Her body was found two days later. Australian detectives took the step of publicly warning young people not to be fooled by the anonymity of social networking sites, saying "you just don't know who you could be talking to."

While such mayhem may be relatively rare, the Internet has empowered new ways of committing crime, including identity theft, fraud, extortion – even sexual assault and murder. In one reported case in the U.S., a sophisticated hacker was accused of tapping into peer-to-peer networks and sending files that were disguised as popular songs but that really contained malware. Once downloaded by unwitting victims, that malware allowed the hacker to take over the victims' computers, enabling him to search for intimate or sexually explicit images of young women stored on their computers. In several cases, the hacker actually turned on video cameras remotely, or posed as the women's boyfriends, asking them via email to send explicit images or videos. The hacker then threatened to distribute these images and videos widely on the Internet unless the victims agreed to make more explicit images or to pay money.

In 2009, the amount of malware (of all kinds) in circulation increased 71 per cent over the previous year, according to a survey conducted by the cybersecurity firm Symantec. The company estimated that nearly 7 million PCs were compromised and turned into hacker-controlled botnets. Symantec also estimated that 51 per cent of all viruses, Trojans and other malware it had ever seen were logged just during the year 2009.

For more discussion of cybercrime, see the chapter in this volume entitled "Addressing Cybercrime – The Role and Responsibilities of an Effective ICT Regulator".

Sources: BBC News, "Shock at Woman's Facebook Murder," 17 May 2010, at <http://news.bbc.co.uk/go/pr/fr/-/hi/asia-pacific/8686417.stm>; Sydney Morning Herald website, "Man Accused of Extortion through Hacking," 23 June 2010, [www.smh.com.au/technology](http://www.smh.com.au/technology); and BBC News, "Web Hit by Hi-Tech Crime Wave," 20 April 2010, <http://news.bbc.co.uk/go/pr/fr/-/2/hi/technology/8630160.stm>.

As indicated, this section outlines some of the threats that exist in the online environment of the Information Society. For more information about the challenges posed by malware and botnets for governments and regulators, see the chapter in this volume entitled, "Addressing Cybercrime – The Role and Responsibilities of an Effective ICT Regulator".

#### 1.4.2.1 Computers Out of Control: Malware and Botnets

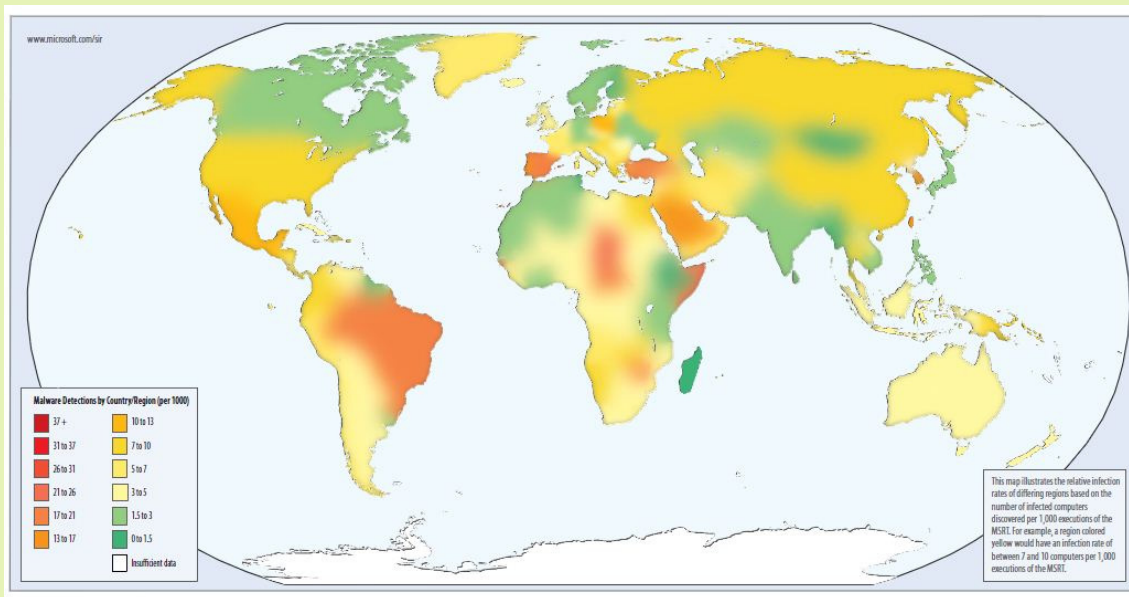
Today, users of computers, laptops, netbooks, and now even smart phones are at risk of infection from *malware* and other unwanted programs. These programs can be used to track keystrokes, steal passwords, obtain personal identifying information, and cripple or disable devices. Hackers can also install *botnet* programs, allowing an unwanted party to hijack the computer to send spam or initiate denial-of-service or other coordinated attacks – essentially, creating an unseen army of computer zombies.

A Microsoft report found that 7 out of every 1000 computers globally are infected with malware.<sup>62</sup>

Individual countries had different infection rates, but those rates did not correspond to overall economic development, for instance, Bangladesh (1.1), Ivory Coast (1.8), Ethiopia (1.1), Brazil (18.1), South Korea (16.0), Turkey (20.0), U.S. (7.8), and Indonesia (3.5). Figure 1.5, below, shows Microsoft's "heat map" showing global infection rates for the second half of 2009. Areas with yellow, orange or red colouring indicate higher frequency of malware detection and generation, while the green areas indicate less malware.

The same Microsoft report found that the type of malware detected varies by country. For instance, in the second half of 2009, password-stealing programs proliferated in China due to the targeting of online games. In Brazil, password-stealing programs targeting banks were the most common form of infection detected. In Republic of Korea, *worms* (autonomous programs that attempt to replicate themselves onto other computers) dominated malware infections because they are spread easily through the popularity of Internet cafes and LAN gaming.

Figure 1.5: Global Malware Infection Rates



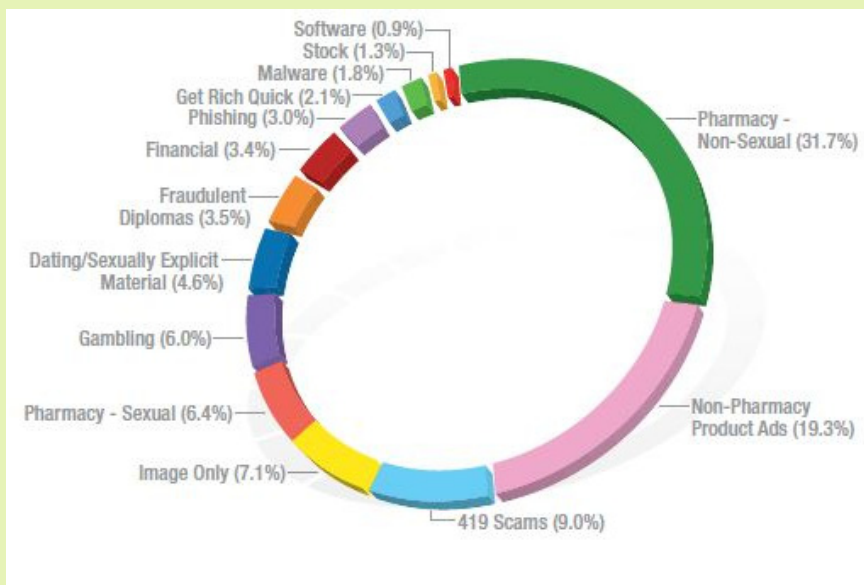
Source: microsoft.com

#### 1.4.2.2 Identity Theft, Fraud, and Invasion of Privacy

Identity theft, fraud, and invasion of privacy are some of the many hazards in the online world. Identity theft can occur through hackers' theft of passwords, credit card numbers, or banking information; it allows criminals to use the victims' accounts to purchase goods on an ecommerce site. Fraud is often perpetrated by scam artists via emails seeking payments for a

share of "tied up funds"<sup>63</sup> or to pay off a "hit man" or pay medical expenses. Fraud artists often seek to prey on the elderly, the disabled, or other vulnerable populations, particularly because many of those individuals are not experienced online travelers. Criminals often seek to sell illegal goods (e.g., prescription drugs and pirated video) or counterfeit goods (e.g., watches, purses, and other designer items), or to obtain bank or credit card information to perpetrate identity theft.

Figure 1.6: Break down of global online threats and fraudulent content, 2009



Source: Microsoft Security Intelligence Report Volume 8 (July through December 2009).

Privacy protection is another concern of regulators. Employers, hackers, *phishers*, and others have been known to employ both legal and non-legal means to obtain information for their own purposes. Different jurisdictions have varying protections in place to safeguard their citizens' personal information. Some countries and regions, including Canada, Asia Pacific, and Australia have based their privacy laws on the OECD Guidelines on the Protection of Privacy and Transborder Flows of Personal Data.<sup>64</sup> The guidelines outline basic principles for nations to apply when developing their own laws regarding privacy. Online privacy protection is continuing to evolve as social networking sites like Facebook, Myspace, and Twitter, redefine attitudes toward privacy, especially among younger users who have grown accustomed to sharing more of their information online.<sup>65</sup>

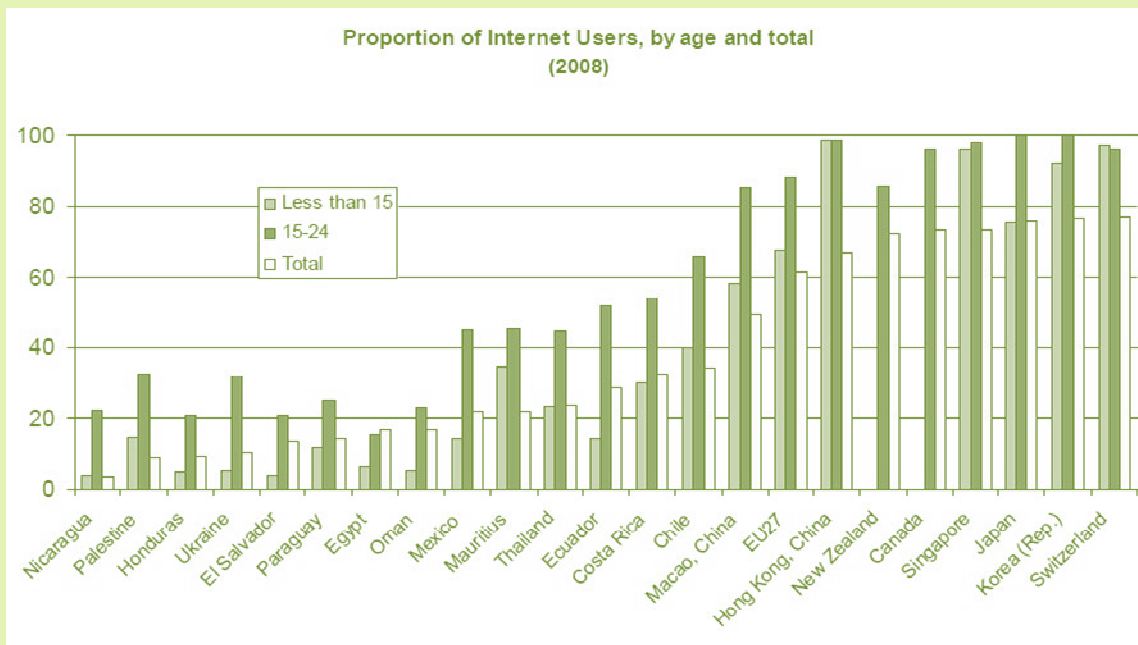
#### 1.4.2.3. Inappropriate Content and Protection from Online Predators

Children are especially vulnerable to dangers lurking on the Internet. Symantec, makers of the Norton anti-virus suite of products, conducted studies of minors' Internet use in India and Malaysia. In India, they

found that 77 per cent of children have had a negative experience, such as receiving inappropriate sexually explicit texts.<sup>66</sup> Twenty-four per cent of children Symantec interviewed in India expressed regret over some actions they took while online. In Malaysia, Symantec found that 87 per cent of children they surveyed had had a negative experience, such as receiving inappropriate content, and 72 per cent had had strangers try to "friend" them on social networking sites.<sup>67</sup>

As part of its Global Cybersecurity Agenda (GCA), the ITU started the Child Online Protection (COP) initiative to foster international cooperation for ensuring a safe environment for children online. COP has identified bullying, violence, racism, pornography, and predation as risks that children face while online.<sup>68</sup> These threats confront a growing number of children. As Figure 1.7 below indicates, the proportion of children below age 15 who are Internet users has reached close to 100 per cent in many developed countries and nearly 40 per cent in some developing ones. Moreover, the proportion is far higher among older youths, from age 15 to age 24. Universally, the proportion of young people who use the Internet exceeds the number of mature adults (i.e., over age 24) in all countries.

Figure 1.7: A Youthful Inheritance: Internet Usage Under Age 24



Source: ITU



## 1.4.2.4 Potential Health and Safety Hazards

Rapid proliferation and use of mobile devices has increased potential health hazards. One area of concern is the possible effect of cell phone radiation from extended mobile phone use. The specific harm of extended exposure is a subject of much debate, and the research is contradictory and, so far, inconclusive. Some studies have suggested a link between long-term use (10 years) and cancer, but no conclusive or demonstrated evidence has been produced. Cell phone manufacturers in many countries are required to publish the *specific absorption rate* (SAR)<sup>69</sup> of a device prior to allowing it be sold.<sup>70</sup>

Safety effects of another kind are clearer: evidence points to a growing problem with individuals who text or use their smart phones while they are driving. The ensuing distraction leads to heightened risks of traffic accidents, resulting in injury and death. In the United States, 30 of the 50 state governments (plus the District of Columbia and Guam) have enacted bans on texting while driving.<sup>71</sup> Many countries have put in place bans on the use of handheld phones while driving (while allowing hands-free voice conversations), and several countries (Israel, Japan, Portugal, Singapore and parts of the United States) have banned any use of wireless communications while driving.<sup>72</sup>

## 1.4.2.5 Environmental Impact

When you “trash” your old computer, who or what is actually trashed? The United Nations Environment Program (UNEP) estimates that, globally, 40 million tons of waste is discarded annually from personal computers, televisions, cell phones, etc.<sup>73</sup> In emerging economies such as India, South Africa or Kenya, the amount of waste from electric and electronic equipment is growing (see Table 1.1, below). The number of mobile phones and personal computers sold are rising while the lifespan of these items is decreasing. UNEP estimates increases in e-waste from a factor of 2 to 20, depending on the level of penetration for each of the items and the expected lifespan of the items. For instance, in Uganda, where PC penetration is low, UNEP predicts a 6-to-8 factor increase by 2020 in e-waste from personal computers. In India, e-waste from cell phones is predicted to multiply 18 times by 2020. In China, e-waste from cell phones is estimated to multiply by only seven by 2020. China will experience proportionally less growth in its e-waste from mobile phones as China’s mobile phone market has high saturation levels. India’s cell phone market is less saturated. As a result, the amount of e-waste from cell phones in India is expected to grow proportionately much higher.<sup>74</sup>

Table 1.1: Quantity of E-Waste Generated in Metric Tons/Year

| Countries       | South Africa | Kenya   | Uganda  | Morocco | Senegal   | Peru   |
|-----------------|--------------|---------|---------|---------|-----------|--------|
| Assessment date | 2007         | 2007    | 2007    | 2007    | 2007      | 2006   |
| PCs             | 19 400       | 2 500   | 1 300   | 13 500  | 900       | 6 000  |
| Printers        | 4 300        | 500     | 250     | 2 700   | 180       | 1 200  |
| Mobile Phones   | 850          | 150     | 40      | 1 700   | 100       | 220    |
| TVs             | 23 700       | 2 800   | 1 900   | 15 100  | 1 900     | 11 500 |
| Countries       | Colombia     | Mexico  | Brazil  | India   | China     |        |
| Assessment date | 2006         | 2006    | 2005    | 2007    | 2007      |        |
| PCs             | 6 500        | 47 500  | 96 800  | 56 300  | 300 000   |        |
| Printers        | 1 300        | 9 500   | 17 200  | 4 700   | 60 000    |        |
| Mobile Phones   | 1 200        | 1 100   | 2 200   | 1 700   | 7 000     |        |
| TVs             | 18 300       | 166 500 | 137 000 | 275 000 | 1 350 000 |        |

Source: United Nations Environment Program, *RECYCLING FROM E-WASTE TO RESOURCES*, July 2009,

[www.rona.unep.org/documents/publications/E-waste\\_20100222.pdf](http://www.rona.unep.org/documents/publications/E-waste_20100222.pdf).

### 1.4.3 The Just Plain Baffling

So far, this section has made clear that the Information Society has brought some intended good consequences and some unintended bad consequences. And then there are some unexpected consequences that, well, we have not really figured out yet. Perhaps a better way to phrase this is that the intensive use of online services and new forms of social interaction have generated questions that have never been addressed before. Among the questions that have emerged during the past decade's immersion in cyber-mania are:

- Are online links and relationships crowding out face-to-face interaction?
- Can individuals actually become addicted to online experiences, to their own detriment?
- Are individuals using the anonymity of the Internet to bully, harass, or deceive others?
- Does the hyper-kinetic, multi-tasking nature of living online lead to a re-ordering of the way we think, observe, and make decisions?
- Are the omnipresence and variety of the online experience affecting the welfare and development of children?
- What affect are Internet commentary and political blogging really having on the level of civil and political discourse?

Typically, one of the best places to seek out discussion of these issues is the Internet itself. In the maelstrom of content being pumped onto the Internet daily (at least in English), nothing escapes becoming a target of discussion or speculation, even the medium itself. In many developed countries, the focus on Internet impacts increasingly features reports (many of them shocking or sensational) about Internet addiction, Internet stalking, Internet bullying and other newfound effects of the Information Society. But the process of systematically studying the nature and frequency of social and psychological effects is really only beginning. As broadband Internet access increases and as children and adults spend more time "inside their monitor screens," there will be more serious academic efforts to determine whether or not the cyber revolution is re-ordering our psyches and societies. Here are some of the areas that will be explored.

#### 1.4.3.1 Does the Internet Make Us Less Social?

In 1995, at the dawn of the Internet age in most countries, the U.S. political scientist Robert D. Putnam

published a book that exploded like a hand grenade in the western media. Entitled *Bowling Alone: America's Declining Social Capital*<sup>75</sup>, the book put forward the proposition that as individuals' economic welfare grew during the decades between 1950 and 1990, their participation in civic organizations actually declined. He used the sport of bowling as an example or metaphor. Traditionally, bowling had been a communal sport, in which adults had joined leagues and played together on teams representing their workplaces, local pubs, or community groups. By the 1990s, however, that communal tradition had unraveled and had been replaced by occasional bowling in pairs or small groups. Bowling remained popular and people continued to do it, but they were not using it to build the same kinds of links and relationships within their communities.

Accordingly the question has arisen: are the groups that coalesce around social networking the new "communities" of the 21st century? Do terms like *friending*, *followers*, and *fans* have relevance in sociological terms? Or, as some critics might suggest, are they contrived, inferior to face-to-face contact, and inauthentic – more the example of "bowling alone" than engaging in a real community? Are Internet interactions replacing real communities, or are they simply adding another layer of social interaction to existing, face-to-face ones?

#### Internet "Addiction"

Perhaps the most formidable application driving consumer take-up of broadband services is Internet gaming. Through gaming consoles with Internet connections, gamers can engage in real-time with other gamers around the world, often in fantasy-type worlds or alternate-reality landscapes. Once logged on, they assume the identities of characters or "avatars" and may quickly become lost in the new cyber-reality created for them. At times, they can become very lost, to the point where they spend nearly all of their waking hours within the game. In the early months of 2010, several horror stories emerged in the global press:

- In Suwon, Republic of Korea, a married couple (who had met through online chatting) was arrested after their three-month-old daughter died, allegedly from accumulated neglect and malnutrition. The parents had been over-indulging at an Internet café, spending essentially all their time there (they were both unemployed), while allegedly leaving their infant child mostly unattended (see also Box 1.10).<sup>76</sup>

**Box 1.10: Republic of Korea: A Wired Nation Addresses Social Change**

Fans by the thousands gather on the beach, paying for tickets to sit in plastic chairs close to the action. The players enter in uniforms featuring corporate sponsors, embraced by cheers, music and spotlights, and welcomed by over-enthusiastic announcers. When they win, they jump up and do specialized dance moves as the crowd goes wild.

Beach volleyball in California? Not hardly. Dragon-boat racing in Singapore? Guess again. It's professional video-gaming in Busan, Republic of Korea, where high school students often spend up to 23 hours a week playing Internet games. In what many consider to be the most highly wired country in the world, gaming may well have reached the status of a cultural institution, like football (of all kinds), cricket, or baseball in other countries.

Stung by high-profile cases of "Internet addiction," however, the National Assembly appears to believe the trend has gone too far. It is debating a bill that would block under-age users' access to online games between midnight and 6 a.m. The online "curfew" proposal follows efforts by the government to educate parents, counsel players and promote alternative activities. So far, nothing seems to be working.

The Republic of Korea government is not united, however, in viewing Internet gaming as a problem. Officials in the Ministry of Culture, Sports and Tourism downplay excessive gaming as "Internet over-indulgence," and broadcasters view it as a new class of "e-sport" to be marketed to fans. Still, Internet de-programming or "rest" camps have begun springing up in several countries, including Republic of Korea (others reportedly include China and the U.S.), where children are given the opportunity to do alternative activities such as canoeing and berry-picking. No word yet on recidivism rates.

Sources: Harlan, Chico, "South Korean Gamers Now Have Plenty To Cheer About," *Washington Post*, 18 August 2010; BBC News, "Gaming Curfew for South Koreans, 12 April 2010, <http://news.bbc.co.uk/1/hi/technology/8617372.stm>.

- Around Asia, there have been at least four cases since 2002 of young men dying of exhaustion in Internet cafes after gaming sessions lasting up to 86 hours, during which they did not sleep and barely ate.<sup>77</sup>
- In China, some psychologists have reportedly sought to define Internet addiction as a clinical disorder, and have set up treatment camps to isolate young people from the Internet.<sup>78</sup>
- In 2007, a teenager in Ohio reportedly killed his mother and wounded his father after the parents confiscated the boy's game console.<sup>79</sup>

Other anecdotal evidence concerns a student at Harvard University who lost his scholarship because he spent all his time online; a man who spent so many sedentary hours sitting down that he had to have his leg amputated due to blood clots; and an 18-year-old who literally chose homelessness when his parents told him to cut back on gaming or move out.

Indeed, there are psychologists that deem Internet or gaming addiction a clinical disorder, although it is not yet universally recognized as such. British psychologists have estimated that between five and 10 per cent of online users are Internet addicts.<sup>80</sup> A study carried out in February and March 2010 at the University of Maryland in the United States found that university students, after only 24 hours without any media exposure (i.e., computers, cell phones, I-Pods, etc.) characterized their

response using "literal terms of addiction." Students reporting feeling uncomfortable or agitated, "frantically craving", and "alone and secluded from my life." The organizers of the study reported that:

*"The major conclusion of this study is that the portability of all that media stuff has changed students' relationship not just to news and information, but to family and friends — it has, in other words, caused them to make different and distinctive social, and arguably moral, decisions."<sup>81</sup>*

In short, the Information Society spent much of 2010 waking up to the fact that it was now a place in which smart phone users could download an application that would show them a view of the street or sidewalk ahead of them. This would allow them to continue texting as they walked, without looking up and without getting hit by a car or running into a light pole.

#### 1.4.3.2 Changing Cultural and Psychological Patterns

Given the ubiquity and near complete acceptance of new modes of media use, it is no surprise that some observers have begun to question what the always-on media explosion may be doing to basic, bedrock assumptions about the way we think and act.



### Online Psychology: A New Way of Thinking?

There is no doubt that the Internet, as a media, offers a more active and interactive experience than was available through print media. This has prompted questions about whether Internet users, particularly children, are learning to read and mentally process information in a way that is fundamentally different from past generations. In a 2009 broadcast, the BBC interviewed high school students about their Internet use and how it has affected their reading habits. One student noted:

*"I know that my reading has changed, the way I read books has changed, since I've started getting most of my information from the web. That I tend not to have such great concentration. I tend to be more distracted when I read books. I don't sit down with a book for hours at an end as I used to. Now doesn't that say something about the impact of the Internet on our reading capacity?"<sup>82</sup>*

Experts, however, differ on whether there is, in fact, any core difference in learning or thinking in a mind molded by Internet multi-tasking. Many point out that the use of digital media has not replaced interpersonal communication or reading and that it is not likely to. Rather, the Internet may simply augment existing media, much the way that television joined radio, magazines, and books as forms of mass communication. It is clear, however, that the more widespread broadband media become, the more they are likely to generate questions, such as:

- What is the role of a teacher in an environment in which students can access any information they need, nearly instantly?
- If every individual can become a "reporter" and "editor," how will readers be able to judge accuracy and detect bias?
- Are newly developing social networking services promoting superficiality at the expense of in-depth contact and the exchange of intellectually challenging ideas?
- Can one really *trust* another person known only as an avatar or a chat-room buddy?

In other words, the Information Society is, in some sense, shaking previous conceptions of authority and legitimacy of information. Even as people find their way to websites that help them to redefine their personal

identities socially, culturally and politically, there literally is no one "in charge" of this process. Ultimately, it may be up to individuals, through personal experience, to derive their own answers to questions of validity and legitimacy in what they experience online.

### Children: Pioneers of the Information Society

Perhaps the most profound development, however, is the extent to which children are on the front lines of this pedagogical and informational paradigm shift. These *digital natives* often get little or no guidance from their elders – the *digital immigrants* – on how to navigate through the online universe.

In many countries, children have cell phones, Facebook accounts, and even smart phones by the age of 12. Research in the United States, for example, indicates that as of 2010, 75 per cent of children aged 12 to 17 owned cell phones, up from 45 per cent just six years before.<sup>83</sup> Moreover, the study found that fully a third of all teens were sending more than 100 text messages per day, with girls sending on average more than twice as many as boys.

Interestingly, the Pew study found that parents were the largest single source of cell phones in the United States; fully 70 per cent of teens' mobile phones were bought and paid for by someone else (i.e., a parent).<sup>84</sup> Parents appeared to value the ability to reach their children amid busy school and work schedules more than they feared the results of giving unlimited communications freedom to their minor children. (See Box 1.11 below.) Schools in the United States do not share this enthusiasm for mobile communications: only 12 per cent of students reported being permitted to have cell phones with them during class periods, and many students faced possible confiscation of their phones if they used them to text during instruction. The most commonly experienced negative aspects of mobile phone use faced by US teenagers in 2010 were:

- Receiving spam (54 per cent of teens reported this);
- Talking while driving (52 per cent reported);
- Texting while driving (34 per cent);
- Being bullied or harassed via mobile phone (26 per cent); and
- Receiving sexually explicit text messages (i.e., "sexting") (15 per cent).

**Box 1.11: Cyber-Bullying: Reaching Out To Hurt**

In January 2010, "cyber-bullying" gained international recognition after a 15-year-old female student in the U.S. state of Massachusetts committed suicide. The girl, who had immigrated to the U.S. from Ireland, apparently had been the subject of taunts and harassment over teen dating disagreements and jealousies. What made the bullying newsworthy was that it played out over text messages and Facebook postings, as well as in school hallways. The incident raised awareness about the role of social networking technologies, cell phones and online anonymity as pathways for threats and emotional abuse.

The case echoed an earlier public outcry in 2006, when a Missouri mother allegedly created a fake account on MySpace, masquerading as a teenaged boy, and then reportedly used it to spread false rumors about a 13-year girl who had had a falling-out with her daughter. The 13-year-old target of this abuse committed suicide, apparently after reading a posting that suggested that the world would be better off without her.

Dubbed "cyber-bullying," the targeting of individuals, many of them young and psychologically fragile, for online abuse has become an increasingly common fact of life for many children. One survey indicated that in the U.S., as many as 25 per cent of children have been a victim of cyber-bullying in one form or another.

Cyber-bullying has presented a grey area for educators, law enforcement, and legislators who are struggling with how to address this new form of bullying. For instance, educators in some "cyber-bullying" instances are unsure whether they can intervene if the activity happens off school property and in cyberspace. Cases such as those in Missouri and Massachusetts have spurred some community and legislative action. Schools are increasingly becoming engaged in educating students about the consequences of cyber-bullying, in an effort to prevent it from occurring. Legislative bodies in the U.S. have in some cases outlawed cyber-bullying, a measure that in many cases may be very hard to enforce.

Sources: Kathy McCabe, "Teen's suicide prompts a look at bullying," *Boston Globe*, January 24, 2010, [www.boston.com/news/local/massachusetts/articles/2010/01/24/teens\\_suicide\\_prompts\\_a\\_look\\_at\\_bullying/](http://www.boston.com/news/local/massachusetts/articles/2010/01/24/teens_suicide_prompts_a_look_at_bullying/); "Cyberbullying, 'Sexting' Major Problems for Schoolkids," *US News*, 20 August 2010, <http://health.usnews.com/health-news/managing-your-healthcare/insurance/articles/2010/08/20/cyberbullying-sexting-major-problems-for-schoolkids.html>; Steve Pokin, "No charges to be filed over Meier suicide," 3 December, 2007, <http://suburbanjournals.sttoday.com/articles/2007/12/03/news/doc47543edb763a7031547461.txt>; "Texting and driving, cyberbullying now illegal in LA," *KSLA News 12*, 15 August 2010, [www.ksla.com/Global/story.asp?S=12981977](http://www.ksla.com/Global/story.asp?S=12981977).

**What Happened to Civility?**

Some observers have noted that, on the way to making social and political discourse more open and accessible, the Internet may also have made that discourse more nasty and intolerant. Depending upon the website or individual blog, reader comments can be disturbingly insulting, insensitive, sophomoric, and often shockingly uninformed. Perhaps what encourages commenters to "have a go" at each other so publicly is the anonymity of the Web. On many websites, commenters must register in advance, but they do not have to identify themselves by name or specific location. This protects the speakers from retaliation or potential targeting, but it also shields them from any accountability for what they post.

In periods of significant political churn, rapid social change, and economic hardship, the result can be commentary that is little more than emotional spleen-venting, with little regard for fact or taste. As a result, operators of blogs and news websites have implemented moderated posting in which reviewers or other readers weed out the most abusive postings before or after they appear. Of course, the coarseness of the comment does not, in the minds of many, preclude it

from being posted on a news site or blog. Many supporters of Internet news media believe that it is better to "let a thousand flowers bloom" rather than to rein in this new venue for political and social expression. But as a warning of *caveat emptor*: many of the "flowers" on news and opinion comment sites are apt to read more like weeds.

**1.5 Has the Information Society Outrun Regulation?**

At its beginning, this chapter posed some basic questions to regulators:

- How can regulators ensure that the benefits of the new social networking websites and new social technologies are available to everyone; that is, how can regulators reverse the digital divide and not exacerbate it?
- What role do governments have in promoting social networking media or the underlying technology and market changes that make them possible?
- Should telecommunication regulators attempt to mitigate the unforeseen aspects of the Information Society, or are areas like computer viruses, data

privacy, and online content beyond the scope of their authority?

- How can regulators in different countries cooperate to help guide the development of new media that clearly have international scope?
- What role is there for industry self-regulation? Can service providers and consumers send market signals to determine privacy protection and other standards?

This section attempts to answer these questions directly, but the most fundamental question is whether a state's existing regulatory structure is appropriate to deal with the new aspects of living in the Information Society. After all, it has only been within the past 20 years that many countries have evolved from state-owned, monopoly provision of telephone services to competitive markets for mobile services and ISPs. The rapid advent of packet-switched, broadband, digital networks and ubiquitous access to content are again posing challenges to regulatory structures that are themselves still in their infancy.

### 1.5.1 The "Regulation Gap"

Increasingly, governments have been reviewing their regulatory structures and codes to determine whether and how they should be amended to address the differences between older, circuit-switched networks and newer, packet-switched ones. Existing regulatory frameworks often do not address newer technologies or maintain outdated categories that do not account for convergence of platforms to provide similar services. Governments can choose to update their regulatory frameworks to rationalize treatment of different network platforms that provide "substitutable" services (i.e., ones that provide essentially the same value or appeal to the consumer).

This entails asking some hard questions. For example, if a consumer can obtain telephone service just as easily over a broadband Internet access service as he or she can using conventional telephony, should the ISP providing VoIP services be regulated in the same way as an incumbent telephone network operator? If so, would such regulation reduce or eliminate the ISP's incentive to build out more broadband infrastructure or to provide more attractive multimedia services? If not, will the broadband ISP bleed off telephone traffic from the incumbent, leading to stranded investments and declining revenue bases?

The following sub-sections explore several areas of regulation that may be impacted by the growth of broadband networks and services and the new Information Society issues that arise.

#### 1.5.1.1 Redefining "Telecommunications"

At the heart of most regulatory structures is a basic determination of what constitutes "telecommunications" and what does not. This provides the basis for a national regulatory agency's (NRA's) jurisdiction or authority over some services and not others. To oversimplify, this is the reason that regulatory agencies have authority over mobile phone networks but not car washes. Furthermore, once jurisdiction is established over a certain set of activities and services, the regulatory structure may then be more explicit about whether to regulate all such activities and services identically, or to apply different regulatory approaches to different segments.

In many cases, the move to broaden the scope of regulatory jurisdiction takes place in the context of discussions regarding convergence, which have been taking place for many years. In Malaysia, for example, the government acted as early as 1998 to establish the Malaysian Communications and Multimedia Commission (MCMC) as the sole regulator of telecommunications, broadcasting, and computing industries.

The Republic of Korea acted in a similar manner in 2008 when it created the Korea Communications Commission (KCC). The creation of the KCC combined the previously separate telecommunication and broadcasting regulatory entities, the Ministry of Information and Communications (MIC) and the Korean Broadcasting Commission (KBC). The new KCC has jurisdiction over telecommunications, spectrum allocation, and broadcasting, including content. This will give the new agency authority over Information Society technologies, including a rapidly growing shift to Internet Protocol Television (IPTV). The introduction of IPTV in the Republic of Korea had been delayed for several years due to disputes between the MIC and KBC over jurisdiction. Within a few months of the KCC's creation, however, the converged regulator finalized the rules enabling operators to provide IPTV. By the end of 2009, Korea had over one million IPTV subscribers.<sup>85</sup>

#### 1.5.1.2 Adopting a Consumer Focus

As this chapter has indicated, much of what the Information Society brings to our world is experienced

personally. That is, the individual experiences, often without any regulatory protection, a whole new universe of services, interactions, computer viruses, phishers, predators, and applications. Governments may come under increasing pressure to enact regulations to protect individuals from harmful content and to hold ISPs responsible for the content delivered over their networks.

In February 2010, for example, an Italian court found three high level Google executives guilty of privacy violations for videos posted on a Google video hosting website showing an autistic teenager being bullied. The verdict put into question one of the newer underlying principles of the Internet that a company is not responsible for prescreening the content of its users' posts. Google indicated that it would pull out of Italy while it appealed the verdict. Italy seemed willing to pursue similar actions against eBay, Facebook, and Yahoo.<sup>86</sup> While similar cases are unlikely to arise in other parts of Europe, similar government action could lead to a chilling effect where companies refuse to operate in certain areas.

Frequently, governments have multiple agencies, across different sectors that are responsible for protecting consumers. Some of these are specialized consumer-protection bodies. In Nigeria, one such agency, the Consumer Protection Council, signed a memorandum of understanding (MOU) with the Nigerian Communications Commission, setting out a division of labour and spelling out a common understanding about which entity would oversee which types of market behaviour. While the MOU, signed in 2005, did not directly address new media or Information Society services, it could easily be extended or expanded to do so.<sup>87</sup>

The question remains, however, whether governments should intrude into the newly emerging world of Internet services. Increasing regulatory attention in new areas carries several attendant risks:

- **"Mission Creep"** – Regulatory agencies possess the staff experts they need to perform their existing tasks, as well as the funding required to do them. The expansion of the role of the regulatory agency into new areas will strain existing resources and inevitably lead to calls for expanded funding and new hiring. Governments will have to decide whether the need for expanded oversight or promotion of Information Society technologies justifies adding those resources.
- **Expanding the "Nanny State"** – While many regulatory agencies do have mandates to protect consumers, it is not clear that all consumer behavior online should or could be micro-managed. Some governments may view online protection as more a matter for consumer education than for regulation. (See Section 1.5.3.)
- **Eliminating Bureaucratic Overlap** – Extending the telecommunication regulatory agency's authority over new areas of activity (e.g., content regulation of websites) may cause confusion, redundancy, or bureaucratic in-fighting if another ministry or agency already believes it has authority in that area. Uncoordinated forays into new areas of law or regulation might actually result in less effective regulation in such cases. One positive approach, as the example of the Nigerian MOU indicates, is for agencies or offices or their parent ministries to work out in detail which situations or issues will be under the jurisdiction of which entity. This can be helpful by (1) eliminating waste and redundant use of resources, (b) concentrating appropriate expertise in a single office, and (3) reducing or eliminating bureaucratic disputes.
- **Regulatory "Forum Shopping"** – In cases where the authority of agencies begin to overlap, the regulated companies soon begin to learn which agency, on balance, is more likely to be more friendly or more hostile to their interests. When that occurs, they are likely to favour having regulatory authority consolidated in one agency over another. They may also engage in "forum shopping": petitioning the "friendly" agency for redress on important issues, in an effort "lock up" that agency's authority or jurisdiction over those issues. Over time, this can exacerbate inter-agency rivalries as regulated entities "pick sides" in an effort to win more lenient treatment from their hand-picked patrons. The agencies caught up in such rivalries may lose their independence as they seek to cooperate with industry's attempt to bolster their jurisdictional authority. Discipline among government agencies can and should be reinforced through binding direction from oversight ministries or through inter-agency MOUs and other agreements. These documents, if they have the force of administrative law and the support of higher levels of government, can be effective in barring industry's attempt to "play one agency off against another."

In light of the above, it is extremely important to examine the regulatory and policy treatment of broadband services and online content carefully. Regulatory structures and codes should be rationalized holistically rather than through a case-by-case process in order to avoid the kind of regulatory uncertainty that dampens incentives for investment in new infrastructure and services. When policies and regulations are promulgated, governments need to articulate them exactly and succinctly to remove any doubt about where regulatory and enforcement powers reside while retaining a sufficient degree of flexibility in order to respond to technological innovation. Regulatory bodies and the regulations they produce should be flexible, not static. As conditions in the market and the world change, these living agencies have to change accordingly. But change does not have to equal chaos, and new rules and changes in authority should be carefully planned, articulated, and implemented to preclude unforeseen outcomes to the extent possible.

### 1.5.2 Potential Areas of Regulation

With those caveats in place, this section explores some of the regulatory areas in which governments are expanding, or considering expanding, their role in guiding the Information Society.

#### 1.5.2.1 Promoting Broadband Build-Out

In many countries, the first step in addressing the broadband revolution is making sure that, in fact, they are having one. The perception that more must be done to provide incentives or direct support for broadband build-outs appears to be nearly universal in both developed and developing countries alike. In general, government steps to promote broadband network-building can be classified as passive or active. Passive support often involves forbearing from regulation or withholding regulatory treatment (e.g., class licensing or lack of tariff regulations) in an effort to "get out of the way" of growth in Internet services. Active support, meanwhile, can include awarding direct grants for network projects, including broadband networks in existing universal service/access programmes, and funding public-private projects for NGNs.

In October 2009, for example, Finland became the first country to establish broadband Internet access at a designated speed as a legal right and part of its universal service programme. The Ministry of Transport and Communications expanded its definition of universal service to include an Internet connection of 1 Mbit/s,

effective 1 July 2010. The Finnish government's goal was twofold: (1) to create momentum toward an eventual goal of providing 100 Mbit/s service by 2015, and (2) to prompt carriers to extend broadband service into rural areas, where availability had lagged behind.<sup>88</sup>

Meanwhile, in May 2010, Brazil completed its National Broadband Plan and announced a USD 6.1 billion plan to increase access to broadband internet services among its low income households. To accomplish its plan, Brazil revived its former state telecom monopoly, Telebras, to handle the build-out of a new fibre network. The plan calls for Telebras to sell wholesale access to the new network to support other carriers who will deliver end-user services unless no current operator is willing to provide service.<sup>89</sup> Private telecom carriers expressed concerns that the plan rolls back privatization efforts Brazil undertook in the late 1990s and that it could negatively impact their businesses.<sup>90</sup> Other middle-income countries with active broadband strategies include:

- Chile – The first Latin American country with such an approach, the Chilean strategy has featured WiMAX development, sponsorship of e-government, and broadband usage by municipalities.
- Turkey – The Information Society Strategy for 2006-10 strove to provide broadband to educational institutions; it also worked to reduce tariffs to roughly 2 per cent of per capita income.
- Malaysia – The MyIMCS strategy in 2006 called for increasing broadband penetration to 25 per cent of households by the end of 2010; the government is now focusing on wireless broadband (WiMAX) and fibre-to-the-home (FTTH) development.<sup>91</sup>

Broadband promotion raises a non-trivial issue concerning who should administer these active support programmes. Typically, any country's national regulatory agency for telecommunications is likely to possess the most expertise and experience in adjudicating bids for broadband support. However, active investment of time and money into a project could colour the willingness or ability of the regulatory agency to crack down on it in an objective way if regulations are broken. Conversely, such an investment might even lead the regulatory agency to favour its "pet" projects over the operations of competitors. Wherever a communications ministry exists alongside an independent regulatory agency, one solution may be to fund any broadband projects through the ministry, thus allowing



the regulatory agency to remain independent and objective.

### 1.5.2.2 Rationalizing Jurisdiction and Regulatory Status

As stated in Section 1.5.1 above, the first step governments often take is deciding what services constitute "telecommunications" for the purposes of regulation. Governments may decide *not* to regulate newly emerging services out of fear that they could squelch innovation or intervene too strongly in a nascent market. Nevertheless, governments may want to ensure that they lay the groundwork for any future regulatory action by spelling out in detail what elements of the Information Society come under the jurisdiction/authority of which agencies.

In the U.S., the foundational statute governing telecommunications regulation remains an amended form of the Communications Act of 1934. Early in 2010, a Federal appeals court ruled that the Federal Communications Commission (FCC) did not have authority under the pertinent section of that law to establish rules requiring one of the country's largest ISPs (Comcast) to implement net neutrality (see Section 1.5.2.4). While the court found that the FCC had jurisdiction over Internet services, that jurisdiction was established

through a different portion of the law (Title I), not the portion that would have allowed the FCC to impose net neutrality (Title II). In effect, that meant that the FCC did not have the same kind of authority over Internet "information services" that it had over standard telephony, which was defined as a "telecommunication service."<sup>92</sup> This called into question FCC's ability to implement some elements of its March 2010 National Broadband Plan – a centerpiece of policy-making initiated a year earlier by FCC.

This raises a set of ongoing and largely unresolved questions in many countries: why is it necessary to continue applying different regulatory approaches to services or networks that provide the identical function to consumers? Particularly with regard to content, is it defensible or logical to regulate or even censor over-the-air broadcasting, but do nothing to influence content streamed from websites? If an incumbent telephone company's tariffs are regulated, why does the government not regulate VoIP providers in the same manner? Some countries simply take the route of banning new services (e.g., VoIP), perhaps in the hope that they will simply go away. This seems to be an effort to simply forestall addressing the changes in the market caused by technological development. In other words, ban it until we can figure out how to control it.

#### Box 1.12: The U.S. National Broadband Plan

In February 2009, the U.S. Congress directed the Federal Communications Commission (FCC) to develop a national broadband development plan. Like other countries, the U.S. recognized the importance of broadband access to its citizens in education, healthcare, energy, public safety, job creation, and economic growth. The goal of the plan was to determine the most effective ways to ensure access to broadband networks throughout the U.S., to accurately track deployment of broadband infrastructure, and to develop strategies to provide affordable access to broadband infrastructure and services.

Over the course of a year, an FCC task force carried out 31 public comment proceedings, held 36 public workshops and nine field hearings, and mounted its own research efforts. In March 2010, the FCC sent the resulting National Broadband Plan to Congress with recommendations for action by the FCC, Congress, and the Executive Branch agencies. The recommendations covered a wide range of topics including spectrum, competition policy, broadband adoption, healthcare, education, energy, economic opportunity, civic engagement, and public safety. The full text of the plan can be found on the FCC's website at [www.broadband.gov/plan/](http://www.broadband.gov/plan/).

The Plan was an attempt by the FCC to set an ambitious agenda for the U.S. to meet future challenges of increased global competition and to address issues of national importance to the United States. Other countries have developed similar plans. The need to provide access to ubiquitous and affordable broadband for all of a country's citizenry will be a challenge for all nations to meet.

*Sources: American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, § 6001(k)(2)(D), 123 Stat. 115, 516 (2009) (Recovery Act); and "FCC To Send National Broadband Plan To Congress," FCC press release, 15 March 2010.*

When new media and services are allowed into markets (as they almost inevitably are), the overall trend toward lesser regulation has meant that older, traditional voice and subscription television services remain under more stringent regulation. Newer, Internet-based or wireless services, however, are generally less regulated. This may well be a conscious effort to promote the growth of competition by placing a regulatory "finger" on the scale in favour of new media and services. It may also, however, be a politically expedient way to avoid the fairly massive effort to overhaul and update regulatory codes, particularly in the face of moneyed interests.

There are examples, however, of countries that have proactively addressed convergence by overhauling their regulatory regimes. As mentioned earlier, one of the earliest attempts to revamp legal and jurisdictional authority to cope with convergence was Malaysia, which enacted its Communications and Multimedia Act (CMA) in 1998. The law, which took effect in April 1999, established a new framework to regulate and accommodate the convergence of telecommunications, broadcasting, and computing. One of the more forward-looking elements of the CMA was a requirement imposed upon the new Malaysian Communications and Multimedia Commission (MCMC) to conduct a review every three years to determine how rules and regulations can be further revised to cope with ongoing convergence.<sup>93</sup>

Recently, regulators have begun to confront new services in order to determine how to regulate them. Internet Protocol Television (IPTV) is one example. IPTV allows traditional telecommunication operators to offer managed video services that resemble traditional, over-the-air or cable broadcasting. IPTV also can offer enhanced capabilities such as video on demand, web browsing, and messaging to subscribers. IPTV is delivered over a high-speed data connection, usually fibre to the home. This package of capabilities, however, is ambiguous in a regulatory context. Is it telecommunications, broadcasting, or a value-added information service?<sup>94</sup>

Countries have taken different approaches to regulating the technology. For example, Republic of Korea, Singapore, and Pakistan have classified IPTV as a broadcasting service and developed a new category of broadcasting licence to accommodate it. New Zealand has classified IPTV services based on the degree of interactivity the service provides, distinguishing broadcasting from Video On Demand (VOD) delivery. New

Zealand and the European Union have distinguished between linear (broadcast) and non-linear (VOD) and have applied different broadcasting and content regulations accordingly.<sup>95</sup>

In light of the above, there may be several different ways to classify a service for regulatory purposes:

1. What kind of entity provides it (this is essentially the traditional, pre-convergence model);
2. What kind of functionality it provides (i.e., is it interactive or one-way, point-to-point or point-to-multipoint);
3. Is the service generating content or merely serving as a conduit or transmission medium; and
4. Can the service be grouped with other services that are substitutable with each other in terms of defining a single market (e.g., cable modem service and xDSL both provide Internet access).

Regulators will have to decide what classification or taxonomy makes the most sense in terms of applying consistent regulatory treatment in a way that allows competition, provides incentives for investment and does not inadvertently favour one platform over another. Some 10 years into the convergence trend, however, many governments continue to overlook the glaring inconsistencies in regulatory treatment that they maintain between older technologies and Internet-related ones. It is hard to escape the conclusion that, for good or ill, the newer technologies are largely unregulated, even as the older ones fade to grey.

### 1.5.2.3 Competition and Tariff Regulation

One of the potential impacts of maintaining imbalanced regulatory treatment of different services is *regulatory arbitrage*.<sup>96</sup> In basic terms, arbitrage occurs when a market player detects a business advantage that occurs solely through favourable treatment built into a country's regulations. The company then exploits that advantage in order to maximize its interests. Common arbitrage strategies include:

- Grey market strategies – masking the true origination point of a call in order to charge a lower price but increase traffic volumes;
- Leaky PBXs – an enterprise customer with a private branch exchange (PBX) can "leak" calls onto local exchange lines to avoid long distance costs;

- Resale of private lines – resellers can market lower consumer rates because they do not have to cover the costs of building out the network facilities;
- International "call-back" – when a caller places a call, it initiates an automatic "call back" from the destination country, or a country with a lower termination cost with the destination country; either way, the cost is reduced from a normal international direct-dial call;
- Refiling or re-origination – operators can take advantage of large disparities in settlements charges between various countries by routing calls through third countries so as to "re-originate" them on routes with lower termination costs; and
- Routing calls over the Internet – calls routed over the Internet may be treated as data transmissions or otherwise avoid interconnection and local termination charges.

These arbitrage opportunities can have an effect on competition. The truth is, the effect can be a positive one, as long as the arbitrage opportunities are open to all market players. If incumbents control too much of the market, they will have no incentive to operate more efficiently or lower prices. Competition can stimulate lower prices, which can then stimulate greater demand, higher traffic levels, and more economic activity in general. Just because circuit-switched traffic levels may flatten, it does not mean that overall traffic is declining; it may simply mean that consumers are finding the least-cost means to meet their needs.

A knee-jerk reaction banning all forms of arbitrage may back-fire in the long run. Sophisticated enterprise customers will simply find new ways to mask their arbitrage opportunities, and average consumers will be stuck paying artificially high prices to incumbents. Those incumbents, meanwhile, will be trying to amortize large sunk costs across a declining subscriber base. Therefore, it is better to allow all operators to take advantage of newer technologies, such as VoIP, to lower rates and compete for greater market share. The bottom line is that regulators may opt to "regulate down" by reducing regulatory restrictions on incumbents rather than "regulate up" by adding restrictions to new market players with newer technologies. The result can be a more competitive market, which in itself forces down prices and leads to innovation and higher quality services. The regulatory treatment of VoIP services illustrates this point.

Many countries have decided to bring VoIP "in from the cold" as a legitimate form of publicly available voice service. Hong Kong, China issued a policy statement in 2006, applying "minimum and appropriate" regulation, as well as technology neutrality to all public voice services.<sup>97</sup> One of the regulator's goals was to avoid hampering the development of VoIP as a viable alternative to traditional, facilities-based telephone services. The European Union has taken a "light touch" approach to regulation of VoIP, deeming it premature to establish a rigid framework while the service was evolving. A WIK-Consult report in 2008 found, however, that there was relatively little harmonization across the EU in terms of regulations for several key aspects of VoIP:

- Numbering and number portability;
- Access to emergency services;
- Interconnection; and
- Lawful intercept.<sup>98</sup>

Meanwhile, countries have taken one of two main approaches to regulating competition on fixed broadband access lines. Japan, South Korea, and France require state-regulated telecom monopolies to provide competitors wholesale access to their networks. In Japan and Republic of Korea, the government has provided financial support to the incumbents for building out their fibre networks in high-cost areas. The model has promoted faster Internet speeds at lower costs than in other countries.<sup>99</sup> Japan and Europe largely require incumbent providers to offer wholesale access to broadband lines in exchange for subsidizing a portion of the cost of build-out to high cost areas.

#### 1.5.2.4 Open Access and "Net-Neutrality"

In the U.S., a hot topic concerns the ability of FCC to regulate Internet service providers' management of their networks. The debate, dubbed "net-neutrality" is over ISPs should be prohibited from discriminating against traffic sent over their networks by non-affiliated content providers or restricting bandwidth heavy applications during peak traffic periods. The debate has pitted the powerful incumbent network operators against the equally powerful "upstarts" from Silicon Valley. Operators such as AT&T and Verizon argue that in order to manage capacity constraints on their backbones, they need the flexibility to charge content providers rates that reflect the value of an increasingly scarce resource. They advocate tiered pricing as a way to provide market signals to content providers and thus control rampant ballooning of content that threatens to swamp existing capacity.



The Silicon Valley champions, such as Google and Yahoo, see the ability of operators to set preferential treatment and pricing as an assertion of market power over the means of content distribution. Under the banner of "net neutrality," they have sought to portray the issue as one of free access and equal treatment on the Internet. Politically, this banner was taken up by the new leadership of FCC that came into office after the 2008 presidential election. This further entrenched the operators in the old-line opposition.

After a U.S. court struck down the FCC's authority to mandate net neutrality (see Section 1.5.2.2), the U.S. Congress joined the debate over the power of the regulator. At its root, this really is a debate over the wisdom of either the regulator or the legislature acting to determine how network operators should manage their networks. Should the government assert a "light touch" or "heavy hand" in regulating Internet services? Will a more assertive government role in maintaining net neutrality deter ISPs from investing in network capacity?<sup>100</sup>

The outcomes of the U.S. net neutrality debate are being watched closely by international regulators and observers and may result in governments taking a more active role in regulating the Internet in their countries. Internet companies such as Google, Yahoo, and Microsoft have been big supporters of net neutrality and open Internet principles globally. They have advocated for it strongly in U.S, Europe, and other parts of the world. For instance, in August 2010, Google wrote the Telecom Regulatory Authority of India espousing the virtue of open Internet and net-neutrality principles.<sup>101</sup> Recently, Chile became the first country to enact legislation to codify the principles of net neutrality.<sup>102</sup>

For more information about net neutrality, see the recent paper published by the ITU on this subject.

### 1.5.2.5 Consumer Protection and Privacy

As noted in a GSR Discussion paper in 2009, "[t]he challenge for regulation is to promote favourable market conditions, in which competition can flourish and foster innovation, whilst at the same time ensuring that consumers' interests are protected."<sup>103</sup> The advent of new forms of media and new Internet applications has only served to make this challenge more complicated, both for regulators and consumers. As the paper went on to point out, regulators can choose to expand forms of consumer-oriented regulation that they previously employed for traditional telecommunications, including:

- Quality of Service protections;
- Tariff regulation;
- Adjudication of complaints; and
- Competition (anti-trust) rules.

Regulators are often much more reluctant, however, to veer into regulatory arenas that are new to them. The primary example of this reluctance is content regulation. Under the guise of "common carriage" or licensed authorizations, operators have in the past held themselves out as neutral "carriers" of private voice communications or (later in the evolution of telecommunications) of third-party media content. Operators seldom had the ability or desire to either (a) generate their own content on a "broadcasting" model, or (b) monitor and track the content of voice or third-party communications. As long as operators remained neutral and offered their carrier services, they were regulated much the way truck drivers or railroad operators were. Just as nobody stops truck drivers and railway operators to check how fresh the bananas inside the trucks and railroad cars are, nobody inspected the content carried by telecommunication operators.

That "common carriage" construct has now broken down in the age of blogs, Hulu, and YouTube. As Section 1.5.2.7 explores further, there is more pressure on regulators to rein in wild content, and a greater perception that consumers are more at risk from:

- Fraud;
- Online Predators;
- Identity Theft; and
- Invasion of privacy.

What are governments doing to address the "Wild, Wild West" of Cyberspace? For one thing, they are passing legislation specifically mandating consumer protection across the board.<sup>104</sup> Australia has taken a proactive role in the area of consumer protection in the Internet Age. The Australian Communications and Media Authority (ACMA) is tasked with investigating complaints about online content and gambling services. It also encourages ISPs to develop codes of conduct and monitors compliance. In a role that some governments and regulators will find increasingly thrust upon them, ACMA attempts to educate the public about Internet safety risks, particularly those threatening children.

At this stage, however, consumer protection in the Information Society appears to be characterized by:

- "Self-regulation" by industry groups, pursuing voluntary codes of conduct<sup>105</sup>;
- An emphasis on education of the consumer, "empowering" individuals to make well-informed choices in online behaviours; and
- An emphasis on addressing tariff or marketing practices, as opposed to more uniquely new-media ills such as malware, online predation, cyber-bullying or Internet "addiction."

In other words, where regulators are addressing consumer issues, they are often doing so in the context of economic issues, rather than the social issues that the Information Society is increasingly raising. One exception has been the attention that many governments have devoted to laws protecting the data privacy of individuals. Many governments, including the EU, Canada, Australia, the United States and Argentina, have passed one or more laws to safeguard individuals' personal records, sometimes resulting in a patchwork of measure affecting different types of personal information, such as medical records. This reflects the ease with which data can be combed, combined, and marketed throughout the Internet. Many websites now have written data protection policies, and ISPs have felt pressure to self-regulate in the privacy sphere to avoid mandatory restrictions by governments.<sup>106</sup>

Depending on the situation, governments can either be friendly to privacy interests or hostile to them. Take the case of Google, which has run into trouble in Europe, where residents complained to several governments that the company was taking pictures of their homes without their permission to populate its Street View mapping program. Google was forced to allow consumers to request that their residences be blurred on Google to protect their privacy.<sup>107</sup> Some governments also objected to a previous practice (which Google said it had discontinued) of collecting information that individuals had sent over unencrypted WiFi connections as it collected photos.

Meanwhile, for its part, Google has also published a "Transparency Report" detailing the requests it has received from governments seeking to (a) obtain records about users, (b) remove content from search results or other web domains such as YouTube, and (c) block access to content from certain jurisdictions.<sup>108</sup> Google stated that it attempts, on its own volition, to eliminate any child pornography, and it explains that some requests relate to defamation, "impersonation," hate speech or privacy, along with a few requests relat-

ing to political speech. Separately, it acknowledges that some governments restrict access to websites in those countries. Facing the difficulty of complying with differing rules on content regulation, Google has made the case that these governments are selectively engaging in Internet "censorship."<sup>109</sup>

### 1.5.2.6 Online Content

In March 2010, false Internet reports of an assassination of a Venezuelan government minister highlighted growing tension between the Internet's rapid growth and government regulation over Internet content. Venezuelan President Hugo Chavez called for new Internet restrictions in response to the matter. Existing Venezuelan law already prohibits online communications that incite hatred or damage a person's dignity but it was unclear whether these regulations would apply in all cases.<sup>110</sup>

This event occurred in the backdrop of emerging opposition voices on Twitter and other social network sites against the Chavez government for limiting freedom of speech, charges that the government disputed.<sup>111</sup> In fact, the rise of Internet usage in the country was directly related to policies that the Chavez government took over the last decade to increase Internet use. Countries desire to encourage Internet use and the marketplace for local content providers while regulating how consumers and content providers use it without limiting the Internet's growth or utility.

In June 2010 a scandal erupted in Indonesia when a sex video with Indonesia's top singer, his girlfriend, and another celebrity started making headlines. The singer was charged with violation of Indonesia's anti-pornography law, though prosecution under that law was in doubt, as the video was stolen from the singer's laptop. In any case, the scandal restarted Internet content regulation efforts, which had previously stalled. In the wake of the scandal, a commission appointed by Indonesia's House of Representatives directed the Ministry of Communication and Information Technology to resume work on a multimedia content regulation framework. This raised concerns by media groups and others that censorship of web content was around the corner.<sup>112</sup>

One way to encompass all converged platforms is to reform the regulatory regime and create a "converged regulator." As mentioned earlier, the Republic of Korea government created a converged regulator in 2008, establishing the Korea Communications Commis-

sion (KCC) through a merger of the former Ministry of Information and Communications (MIC) and Korean Broadcasting Commission (KBC). This placed the responsibility for telecommunications and broadcasting content in a single regulatory agency. South Korea has in many ways led the world not only in regulatory reform but in pioneering adoption of the Information Society itself.

Another country to have consolidated its electronic communications regulation under one regulator is the United Kingdom. Its Office of Communications (Ofcom) has a mandate to manage all spectrum resources, as well as to regulate telecommunications and broadcasting. By the end of 2009, three additional European Union countries (Finland, Italy, and Slovenia) had taken action to create converged regulatory bodies, with encouragement from EU policy-makers.<sup>113</sup> Only seven of 30 OECD members, however, have single regulatory agencies with jurisdiction over telecommunications, broadcasting carriage, broadcasting spectrum assignment, and content.

It may not be enough, however, to simply create a unified regulator. As an example, the U.S. FCC (one of the seven OECD countries mentioned in the previous paragraph) has always had jurisdiction over licensing for both telecommunications and broadcasting. But it has employed vastly different regulatory regimes and approaches: “common carriage” for traditional telephony and light content regulation for broadcasting. As newer forms of media emerged (e.g., cable TV and direct satellite broadcasting), the FCC enacted a variety of still-different rules for those industries. Moreover, the Commission’s rules have been directly affected by various court decisions with narrow impacts on particular sets of rules. The result has been an array of differing regulatory regimes, administered by the same regulatory agency. This points to an overall need for “regulatory convergence” that transcends structural issues involving the organizational chart of the NRA.

In truth, telecommunication regulators are often reluctant to be embroiled in content regulation, seeing it as a cultural or political function for which they are ill-prepared as engineers and economists. Indeed, governments themselves often view content regulation as a sensitive issue that cannot be left to technocrats who normally evaluate interconnection rules or channel plans. The fact that social networking applications and YouTube have probably forever muddied the bright line between transmission and content does not make it any easier for governments to respond by reinventing

regulatory functions whose antecedents have had little to do with one another.

As broadband Internet access becomes more prevalent, however, it is certain that regulators will be forced to make a key decision. Will they continue to keep their hands off Internet content, or will they respond to increasing (if episodic) calls for some kind of regulation of content that many users will find offensive.<sup>114</sup> Even in the United States, a country with a distinct Libertarian policy view of the Internet, a 2007 poll found that a majority believed that the government should be involved in some form of monitoring of the Internet.<sup>115</sup> The poll also found, perhaps not surprisingly, that the age of the respondent was a factor in that person’s view: three-quarters of the Americans over age 70 favoured Internet content regulation, skewing the overall figure higher.

### 1.5.2.7 Security Issues

While it is popular to think of the Information Society as global and supra-national, the Internet is, in fact, overlaid onto a system of individual nation-states, with separate governments and interests. Those countries are now struggling with how to foster the use of new technologies while maintaining important government functions related to law enforcement and national defense. In part, this is a result of the evolution from circuit-switching, which lent itself fairly easily to wiretapping (authorized or otherwise) to packet-switching, which complicates the task of monitoring communications. Moreover, the market demand for encryption capability has further challenged the ability of governments to safeguard national security.

In the summer of 2010, Saudi Arabia nearly banned the use of Research in Motion (RIM)’s Blackberry phones in the kingdom, due to concerns that terrorists and criminals could use the devices to communicate without the Saudi government being able to intercept messages. Negotiations between RIM and the Saudi government led to an agreement, in which the company agreed to place communications servers used to route messages within Saudi borders. Meanwhile, the United Arab Emirates announced plans for a Blackberry ban to take effect in October 2010. Other countries, including Lebanon, India, and Algeria, have expressed similar concerns about the use of the technology to evade law enforcement.<sup>116</sup> One analyst pointed to the RIM-Saudi Arabia compromise as a development that underlined “the growing clout of the local regulator and service providers.”<sup>117</sup>

One of the issues undergirding the Blackberry controversy is a perception that RIM made special concessions to countries such as Russia and China to operate within their borders that allow these governments to monitor and decrypt secured messages over the RIM network – a charge RIM denies.<sup>118</sup> This perception, however, led other countries to seek similar arrangements with RIM, such as the Saudi Arabia compromise. In the future, handset and other equipment manufacturers may have to work with governments to ensure that lawfully mandated access by security forces can be achieved using consumer or network equipment.

#### 1.5.2.8 Spectrum

The Information Society has bred a lot of changes in the telecommunication regulatory arena. One area that remains contentious, however, is how to regulate among competing demands for the raw resource of mobile services: spectrum. The increasing broadband capabilities of mobile devices and networks are screaming out for greater chunks of unencumbered spectrum. Channel sizes must be larger, guard bands must be installed, and spectrum must either be shared or re-farmed. Countries that have made way for 2G and 3G, as well as WiMAX, are now bracing for 4G LTE-Advanced and WiMAX-Advanced technologies. It is as though wireless broadband were sweeping like a plague of locusts through the allocation charts of countries around the world, consuming vast amounts of spectrum below 4 GHz and wanting even more.

It began with the WiFi revolution, which has been well documented. Millions of devices now contain embedded WiFi chips, including smart phones, mp3 players, digital cameras, netbooks, and laptops. WiFi technology has offered low-cost or free access to broadband services to millions of users worldwide. Community or municipal Wi-Fi networks have allowed local governments to deploy broadband infrastructure and services in a cost-effective manner. In countries that have allowed unlicensed access to WiFi, WiFi networks have exploded.

However, regulations in some countries have limited or hindered the ability of communities to deploy WiFi networks. Some countries require any wireless Internet service provider to have the blessing of the NRA through licensing or registration to operate the network. A paper by Van Gorp and Morris found that some countries impose regulatory burdens on operators that constrain the utility and ability to deploy WiFi networks. Some nations require a spectrum licence to operate

WiFi equipment.<sup>119</sup> Such requirements can limit the growth and benefits that these networks provide.

On the licensed sides, delays in spectrum auctions for 3G and 4G services have been a major cause for operators in some countries to deploy faster wireless networks in emerging markets. China and India provide two illustrative examples. In China, after many delays, 3G spectrum was finally assigned in 2009 to the country's top three operators. In 2010, India conducted its first spectrum auction for 3G and Broadband Wireless Access Spectrum (BWA).<sup>120</sup>

The progress of rolling out 3G networks, however, has been different in the two countries. In China, the operators were quick to deploy and offer 3G services soon after the spectrum was made available to them. In India, the 3G auctions generated USD 15 billion – twice the amount the Indian government expected.<sup>121</sup> India's Telecom Regulatory Authority of India (TRAI), however, enacted additional fees and market restrictions. It also called for a spectrum cap of 8 MHz or 10 MHz in all service areas. While demand for wireless and growth prospects are high, some analysts now worry that TRAI's restrictions and the high cost of spectrum may lead to less capital spending, reduced coverage areas, and reduced network capabilities.<sup>122</sup>

#### 1.5.3 Education or Regulation?

As regulators consider whether and how to monitor and regulate new Information Society applications, networks and services, one option to consider is stepping up ways for consumers to educate themselves about the new technologies. Education has a dual purpose:

- To learn how to use broadband networks and computers to secure positive benefits from the Internet, and
- To learn how to avoid the pitfalls of life online, including cyber-crime, hacking and the potential dangers for children and other vulnerable populations.

Of course, regulation and education are not mutually exclusive. In fact, education is a first step in empowering thoughtful and appropriate regulation. Consumers who know how to navigate through and avoid negative aspects of the Information Society are also more likely to know when they are being victimized – and to report it.

The U.S. Federal Trade Commission maintains several websites to provide information to consumers on the Internet. The agency, which is tasked with protecting consumers across multiple industries, maintains a "Computers & the Internet" portal<sup>123</sup> that provides advice on numerous topics:

- Buying a computer and Internet access;
- Entertainment on the Internet;
- Online Shopping and "E-payments";
- Privacy & Security;
- Spam email; and
- "Web scams"

Each topic has its own section of Web pages, with links to additional, in-depth information on issues such as peer-to-peer network vulnerabilities, video game ratings, and protecting children from hazards of online gambling.

In addition to the Fair Trading Office (for consumer protection), the UK government operates a Child Exploitation and Online Protection (CEOP) Centre. CEOP is described as a "multi-agency" effort to coordinate law enforcement and intelligence gathering about predators and child exploitation. As part of that effort, CEOP operates a website ([www.thinkuknow.co.uk](http://www.thinkuknow.co.uk)) that provides age-appropriate information to children and teenagers, as well as to parents, caregivers, and teachers about how to safely use the Internet. These websites represent efforts to use the Internet itself to teach consumers about how to maximize the benefits of the Information "Superhighway" while avoiding the potholes and navigating the hairpin turns.

Singapore has developed "Infocomm Security Masterplans" that work to secure the Internet infrastructure, to increase the public sector's ability to handle security threats, and to increase awareness and adoption of cyber security awareness. Singapore's Cyber Security Awareness Alliance was formed to work with improving security in businesses. The Alliance also partnered with the National Crime Prevention Council to form a Virtual Cyber Security Park targeted towards students and allows them to learn about cyber safety and security educational online games. The Alliance is also using social networking platforms to create groups that will share cyber security tips and other best practices.<sup>124</sup>

## 1.6 Conclusion

Many people around the world are now living in the Information Society. This is not simply a superficial change; it is more than a matter of plunking down money for a new phone. It is already clear that the Information Society changes the way individuals communicate, access entertainment and information, and even how they figure out where they are located. In short, the Information Society is changing the way people live, the way they relate to each other and their surroundings, and possibly even the way they learn and think. Experts and observers are now in the throes of trying to deconstruct what this always-on revolution means in psychological, sociological, and economic terms.

To a very real extent, though, the story of the Information Society still remains the story of the digital divide. The Internet is coming to a screen near you – except, of course, if there *is no* screen near you. In many parts of the world, and even in some parts of developed countries, there is not sufficient infrastructure to support broadband transmission. Without that underlying brick-and-mortar reality, there can be no cyber-world fantasy. Often, the difference between broadband capability and dial-up frustration is a matter of a few miles, a few city blocks or the adequacy of the local power grid. But just as often, the difference is a yawning chasm of income and affordability. Regulators and policy-makers often find that the first-order task they face is just making the Information Society reachable for their citizens.

More work awaits those regulators. While the benefits of the Information Society are manifest, the broadband revolution has opened up a Pandora's Box of new issues and challenges, from cybercrime to spectrum management (and everything in between). In most countries, regulators are now fully engaged in addressing these challenges. But for now, consumers of all ages are very much pioneers in the Information Society, reaping the benefits of their new world, but also incurring the risks, without much regulatory protection. It will be up to policy-makers and regulators to determine how actively regulators can or should intervene to protect consumers without squelching the very innovation that has revolutionized telecommunications in the 21st century.



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