

International Telecommunication Union
United Nations Conference on Trade and Development



WORLD INFORMATION SOCIETY 2007 REPORT **Beyond WSIS**

>> *Executive Summary*



This document is the Executive Summary of the **ITU/UNCTAD 2007 World Information Society Report: Beyond WSIS**. This is the second in a series of reports., launched in May 2006, which are intended to track progress towards bridging the digital divide and implementing the outcomes of the World Summit on the Information Society (WSIS), a UN Summit held in two phases in Geneva in December 2003 and in Tunis in November 2005 (see www.itu.int/wsis).

The full text of the report and selected data tables are available, free of charge, online on the ITU website at www.itu.int/wisr and on the UNCTAD website at www.unctad.org/wisr. Printed copies of the report, including the full statistical annex (200 pp), are available from the ITU sales office, and can be ordered using the order form at the back of this Executive Summary or from the website at www.itu.int/wisr.

Also available from ITU (discounts available for Members, LDCs, university libraries etc):

World Information Society Report 2006 (July 2006) 100 CHF

ITU Internet Report series (selected titles)

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The Digital Divide: ICT Diffusion Index 2005 (2006)

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International Telecommunication Union
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WORLD INFORMATION SOCIETY REPORT **2007**

Beyond WSIS

Executive Summary

May 2007



UNITED NATIONS



International
Telecommunication
Union

The Work of the *Digital Opportunity Platform*

A multi-stakeholder partnership for measuring and bridging the digital divide

The *Digital Opportunity Platform* (DOP, www.itu.int/digitalopportunity) is an ITU-led multi-stakeholder partnership for bridging the digital divide. First initiated as the “Digital Bridges” programme in 2004, the Platform unites stakeholders from various backgrounds, including UNCTAD, UNESCWA, London Business School (LBS), LIRNEAsia and LinkAfrica, with its founding partners of ITU, the Ministry of Information and Communication of the Republic of Korea (MIC) and the Korea Agency for Digital Opportunity and Promotion (KADO).

The DOP has mobilized the experience and capabilities of its stakeholders in many different activities, including policy research, data collection, information exchange, capacity-building and other support for policy processes. The core focus of the Platform is on the analysis and measurement of the evolving Information Society, as called for by the WSIS Geneva Plan of Action (Para 28). Overcoming the digital divide requires research, analysis and measurement – no sustainable solution is possible without a clear understanding of the problems underlying the divide. The policy toolkit being developed under DOP will further the knowledge of the divide and allow tailored recommendations to be made for specific countries or regions, based on facts about what worked and what did not in certain contexts. In this sense, the insights of the different stakeholders involved are invaluable in developing customized and appropriate policy support.

Through its growing network of partners, the DOP is an active partner in WSIS implementation and will continue translating pledges into tangible, results-oriented activities, contributing to the global process of turning the digital divide into digital opportunity for all. The opinions expressed in this document as those of the author and do not necessarily reflect the views of the International Telecommunication Union or its membership.

Source: For more information, see www.itu.int/digitalopportunity.

Foreword

ITU and UNCTAD are proud to publish this 2007 edition of the World Information Society Report, benchmarking the continuing growth of the Information Society around the world.

This Report is important for a number of reasons. Firstly, the World Summit on the Information Society (WSIS) recognized the need for monitoring and evaluation of WSIS follow-up to determine whether the Summit succeeded in what it set out to do. This Report tracks progress in digital opportunity for 181 economies since the start of the WSIS process, which was held in two phases: in Geneva in December 2003 and in Tunis in November 2005.

Secondly, this Report shows that there has been a steady expansion in digital opportunity, both in terms of more widespread access to basic Information and Communication Technologies (ICTs) and the growth in high-speed access to ICTs, on both fixed line and mobile networks. Ever greater numbers of people around the world are enjoying access to the benefits ICTs can bring. Already, the number of people using ICTs around the world has doubled since the WSIS was first proposed in 1998. By the start of 2008, there will be around three billion mobile phones and more than one billion fixed lines around the world. This suggests that we have already surpassed the WSIS target that states that more than half of the world's inhabitants should have access to ICTs within their reach. However, the Report also suggests that disparities and inequality in access are evolving: the digital divide is taking on new forms in terms of the differences in the speed and quality of access to ICTs.

Lastly, this Report is important because, as a joint publication between ITU and the United Nations Conference on Trade and Development (UNCTAD), it is a fine example of the principles of multi-stakeholder collaboration that the Summit endorsed. The report has been created by the "*Digital Opportunity Platform*", an open multi-stakeholder platform with contributions from governments, academics and civil society, as well as inter-governmental organisations. For it is only by drawing upon the resources of a range of different stakeholders that we can build an inclusive, people-centred and development-oriented Information Society, that can accommodate the needs of all participants.

For these reasons, ITU and UNCTAD are proud to publish this second edition of the World Information Society Report and we look forward to a continued and successful collaboration in monitoring WSIS follow-up in the implementation of the WSIS goals by 2015.

Geneva, 16 May 2007.



Dr. Hamadoun I. Touré
Secretary-General
International Telecommunication Union (ITU)



Dr. Supachai Panitchpakdi
Secretary-General
United Nations Conference on Trade and
Development (UNCTAD)

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Introduction

The **World Information Society Report 2007: Beyond WSIS** tracks progress in the implementation of the outcomes of the World Summit on the Information Society (WSIS). At the Summit, world leaders committed to turning the digital divide into a digital opportunity for all. They also agreed on a set of targets for improving access to Information and Communication Technologies (ICTs), to be achieved by 2015 at the latest.

The Report finds that the digital divide is shrinking in most technologies, especially mobile telephony, but that limitations in the availability and affordability of broadband remain a cause for concern. Although broadband is now available in 170 economies by the start of 2007, it remains at least ten times more expensive in low-income countries than in high-income countries and is often unavailable outside urban areas.

The Report also examines strategies to boost ICT infrastructure and broaden access to ICTs, including market and regulatory reform, investment promotion strategies and fiscal incentives. It illustrates these strategies with a series of mini-case studies for a range of economies, both developed and developing. The Report uses the evaluation methodologies endorsed by the WSIS to measure “opportunity” in access to ICTs, using the Digital Opportunity Index (DOI), developed by the *Digital Opportunity Platform*, and the ICT Opportunity Index (ICT-OI), developed by ORBICOM and ITU. The implementation of WSIS programmes is on track, with many projects underway around the world to meet WSIS targets by 2015.

Threats to online security are becoming more sophisticated and pervasive. Building confidence and security in the use of ICTs was a key aim of the WSIS and the Report examines the evolution in cyberthreats, including spam, spyware, botnets, identity theft, breaches of privacy and other risks associated with online transactions. By some estimates, spam now accounts for 90 per cent of email traffic, but more serious is its role in spreading viruses or in fraudulent activity and phishing. These risks threaten to undermine user confidence and inhibit the growth of the online world.

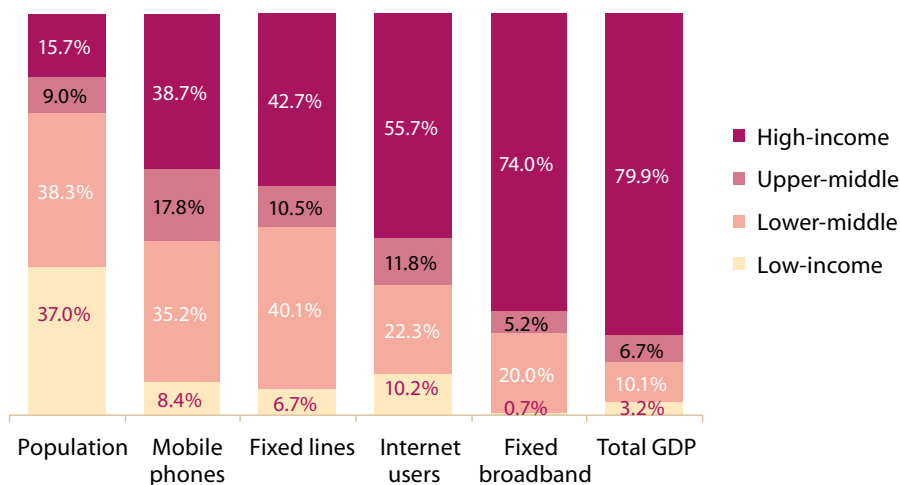
This Report is being issued to coincide with the cluster of WSIS relating meetings held in Geneva, 14-25 May 2007, to coordinate WSIS implementation. The full text of the Report (200 pp) is available online free of charge at www.itu.int/wisr and www.unctad.org/wisr.

The digital divide is shrinking

The digital divide continues to evolve and the Report uses different statistical techniques to monitor the digital divide. Developing countries (most notably, India and China) are gaining on OECD countries in terms of fixed line penetration, mobile cellular subscriber penetration, Internet usage and broadband penetration. Least Developed Countries (LDCs) are also catching up with developing countries in terms of mobile phones, Internet usage and broadband. However, LDCs are actually being left behind in fixed lines, where there is a widening gap between developing countries and LDCs. This may later have a negative impact on the take-up of broadband in LDCs.

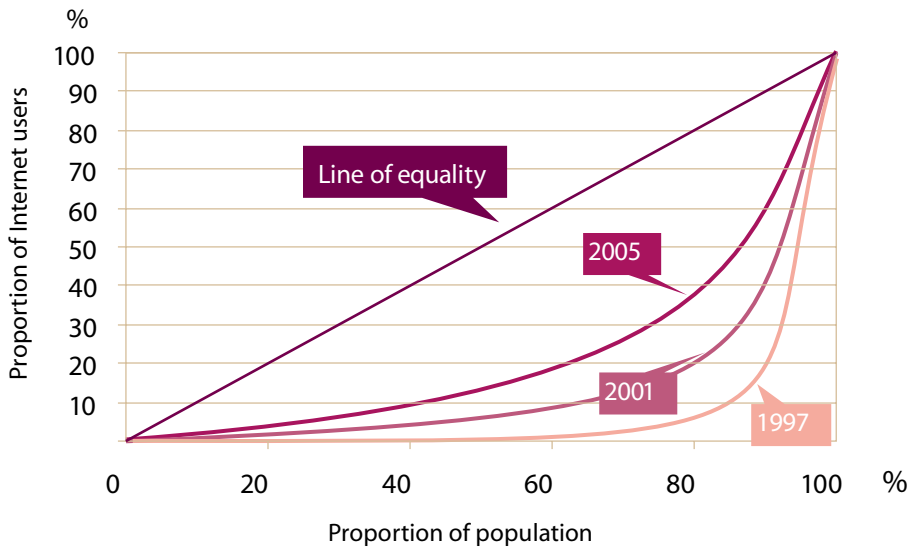
Mobile telephony holds the greatest potential to bridge the digital divide. The number of mobile cellular subscribers around the world is growing rapidly. Low-income countries are making important gains in mobile telephony (see Figure 1), with mobile phones outnumbering fixed lines by seven to one in LDCs, and by as much as nine to one in Sub-Saharan Africa – one example of “technological leapfrogging”. In some developed markets, consumers are “cutting the cord” and increasingly opting for mobile phone ownership rather than fixed lines. Since the number of mobile subscribers overtook the number of fixed lines in 2002, more than a billion new subscribers have been added to mobile phone networks. By the end of 2008, more than half the world’s population is expected to have access to a mobile phone.

Figure 1: Distribution of major ICTs by income group of economies



Source: ITU/UNCTAD/KADO Digital Opportunity Platform.

Figure 2: Narrowing of the digital divide in Internet usage, 1997-2005



Source: ITU/UNCTAD/KADO Digital Opportunity Platform.

The impact of mobile phones in reducing the digital divide is most remarkable in Africa, where their number has grown from just 15 million in 2000 to over 160 million by the end of 2006. In a continent which is poorly served with fixed line infrastructure, mobile phones are now the primary medium for electronic communications. Much of the new investment is coming from companies based in Africa itself.

The digital divide is also narrowing in terms of Internet usage. In 1997, the nearly three-quarters of the world's population living in low-income and lower-middle income economies accounted for just 5 per cent of the world's Internet users (see Figure 2). By 2005, they accounted for just over 30 per cent of all Internet users. Of note here were the gains made by China, where the Village Connected Project and telecentre initiatives have helped boost Internet use and interest in online services in rural areas.

However, the digital divide is evolving from inequalities in basic access to ICTs and their availability, to differences in the quality of the user experience. Access to ICTs increasingly determines access to wealth and income, and will, in turn, determine the leaders in tomorrow's knowledge economy. The debate over the future of the digital divide is now moving away from "quantity" in basic connectivity and access to ICTs to measures of "quality" and "capacity", or speed of access.

Broadband Internet

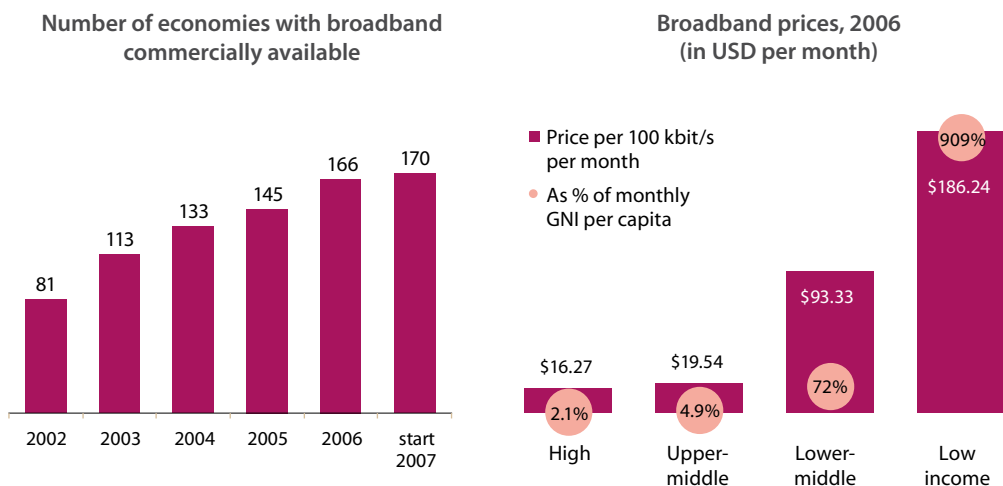
Broadband service is currently commercially available in 170 economies (see Figure 3, left chart), with Lesotho the latest country to introduce ADSL in spring 2007.

In terms of broadband subscribers, high-income economies account for nearly three-quarters of total broadband subscribers worldwide (see Figure 1). Lower-middle income economies accounted for 20 per cent (with China alone accounting for 87 per cent of these or some 15 per cent of the global total). Low-income countries accounted for less than 1 per cent of total global broadband subscribers, with India and Vietnam accounting for virtually all of these.

2005 and 2006 were a period of startling growth in Internet in many countries, thanks to the boost from broadband. The United States remains the largest Internet market in terms of the number of Internet subscribers, but China is gaining fast and, if current growth rates continue, China could overtake the United States in terms of total Internet subscribers within two years (see Table 2 at the end of this Summary).

There is a striking digital divide in terms of the price of access to broadband between different parts of the world (see Figure 3, right chart). Users in low-income countries

Figure 3: Broadband worldwide



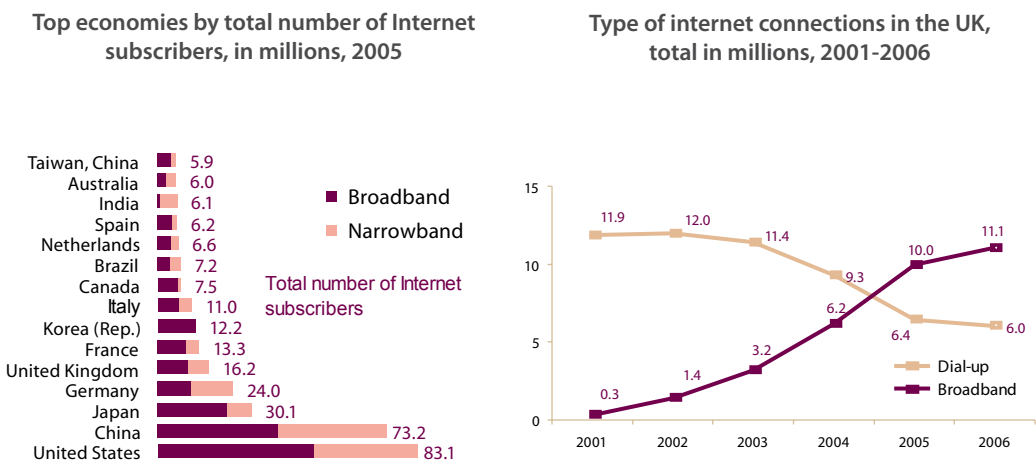
Source: ITU/UNCTAD/KADO Digital Opportunity Platform.

pay, on average, some US\$186 per month for every 100 kbit/s of connectivity, which is more than ten times higher than the average price paid in high-income economies and compares unfavourably with the best practice prices of below USD 0.10 per 100 kbit/s per month in Japan and Republic of Korea (see Table 2).

In developed countries, growth rates in Internet subscriptions tend to be lower, but many subscribers are exchanging their narrowband dial-up connection for a higher-speed broadband connection. One example is the substitution of broadband for dial-up in the United Kingdom (see Figure 4). In the United States, some 60 per cent of all Internet connections are now broadband, while in Japan and Spain, efforts by operators to encourage consumers towards broadband have resulted in three-quarters of Internet subscribers now using broadband. In the Republic of Korea and Canada, virtually all Internet subscribers already enjoy broadband access to faster, advanced services such as video, teleconferencing, multi-player gaming and triple play.

Meanwhile, the maximum speeds on offer continue to increase. 2006 saw the launch of the first 4 Mbit/s offer in Africa (in Morocco, see Box 2). Broadband Internet service is now available in some twenty-two African countries, although the high price tags attached to many of these offers put them beyond the reach of most ordinary consumers.

Figure 4: The new substitution



Source: ITU/UNCTAD/KADO Digital Opportunity Platform (left chart); OFCOM (UK), "The Communications Market 2006" at: <http://www.ofcom.org.uk/research/cm/cm06/> (right chart).

Mobile telephony

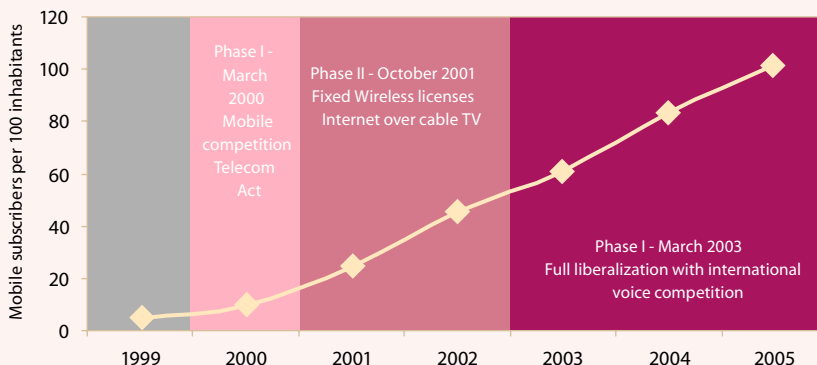
In many countries, mobile telephony is booming, as the result of market and regulatory reforms, alongside operators' new initiatives and offers. As the case of Jamaica illustrates (see Box 1), in many countries, the licensing of multiple operators has helped introduce competition and laid the foundations for growth with multiple operators offering competitive packages.

Box 1: Liberalization of the mobile market in Jamaica

Jamaica was the first middle-income nation to break the 100 per cent mobile penetration barrier in 2005. Jamaica has achieved this success thanks to a market liberalization process that began in 1999, when it renegotiated the 25-year monopoly held by Cable and Wireless, one of the first Caribbean countries to do so. In April 2000, Jamaica liberalized its mobile market by granting licenses to two new mobile operators, Digicel and Oceanic Digital, for US\$ 92 million (see Figure 5). The second phase began in October 2001, when licenses were issued for Fixed Wireless and Internet access over cable TV networks. Liberalization was completed when the international long-distance market was opened up to full competition in March 2003.

Digicel launched its mobile network in April 2001 and became an overnight success story. In its first 100 days of operation, Digicel gained 100'000 subscribers, a target it had originally envisaged reaching after one year. After its first year of operation, Digicel had 400'000 subscribers; roughly what the incumbent had taken a decade to achieve. Jamaica's success is significant, as it disproved a long-established theory that small island economies were too small to sustain competition. One positive factor for mobile competition in small island economies is that they are often tourist destinations. Given the prospects for mobile telephony and roaming, these markets are attractive to investors, which stand to reap significant roaming revenues from tourists.

Figure 5: Mobile penetration and market liberalization phases, Jamaica



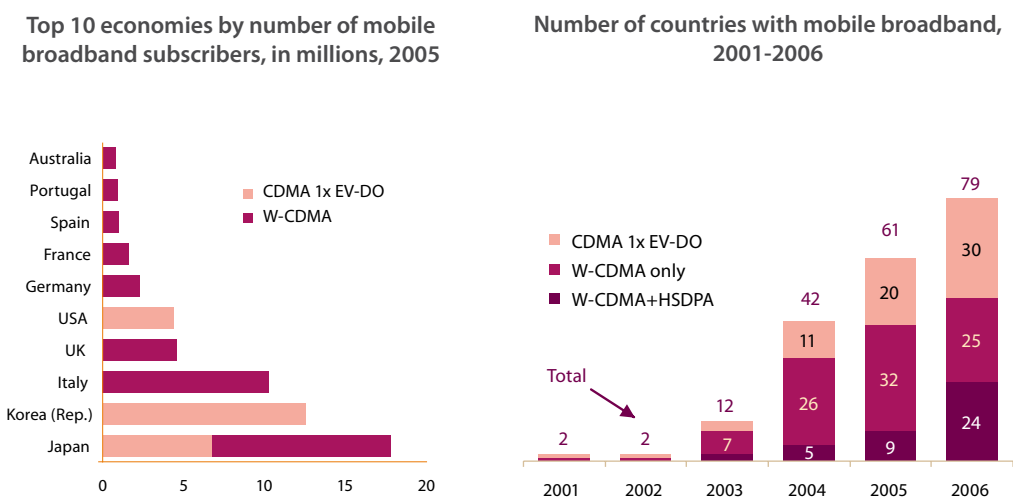
Source: ITU/UNCTAD/KADO Digital Opportunity Platform, adapted from Office of Utility Regulation (OUR), Planning Institute of Jamaica (PIOJ) and Spectrum Management Authority (SMA).

However, the private sector also has a vital role to play, with high-growth marketing strategies tailoring offers to consumers' needs. Of special interest is the emergence of strategic investors from developing countries (such as MTN, Vodacom, Orascom and Celtel) with operations throughout Africa and the Middle East, enjoying subscriber growth far in excess of their counterparts in more mature markets. Low-income countries have huge potential for mobile telephony, accounting for over a third of the world's population, but just 8 per cent of the world's mobile subscribers (see Figure 1). The future for operators in low-income countries lies in pioneering new services (including mobile banking and instant messaging), innovative payment methods, credit transfer and pricing models for lower and variable-income subscribers (e.g. low-price recharges).

There is strong growth in third-generation (3G) mobile services, particularly in Asia and Europe, where nearly all the top ten largest markets are situated (see Figure 6, left). Mobile broadband (3G) services are now offered in many developing countries throughout central and eastern Asia, Latin America and the Caribbean. Wideband Code Division Multiple Access (W-CDMA) networks were operational in 49 countries by the start of 2007, while 24 countries had High Speed Download Packet Access (HSDPA) networks in commercial deployment (see Figure 6, right).

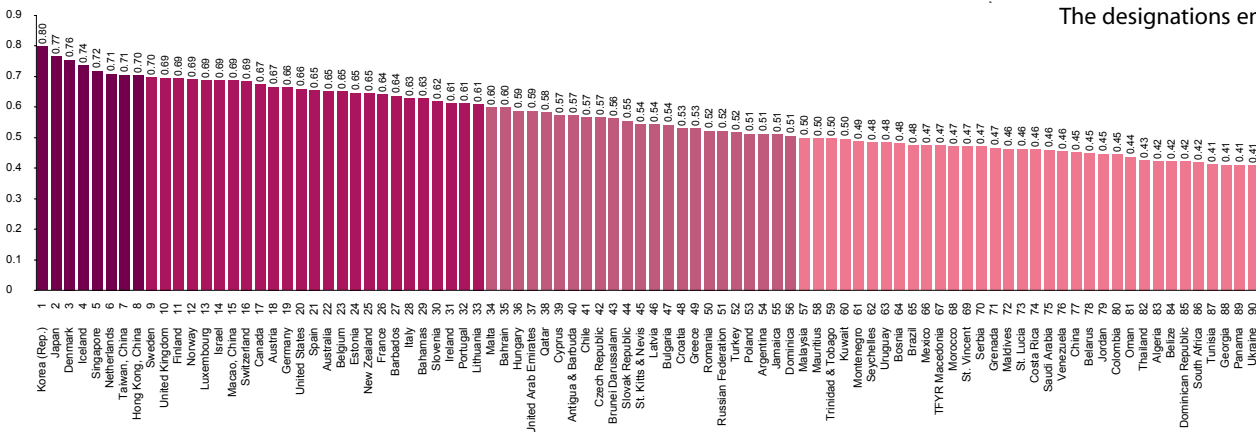
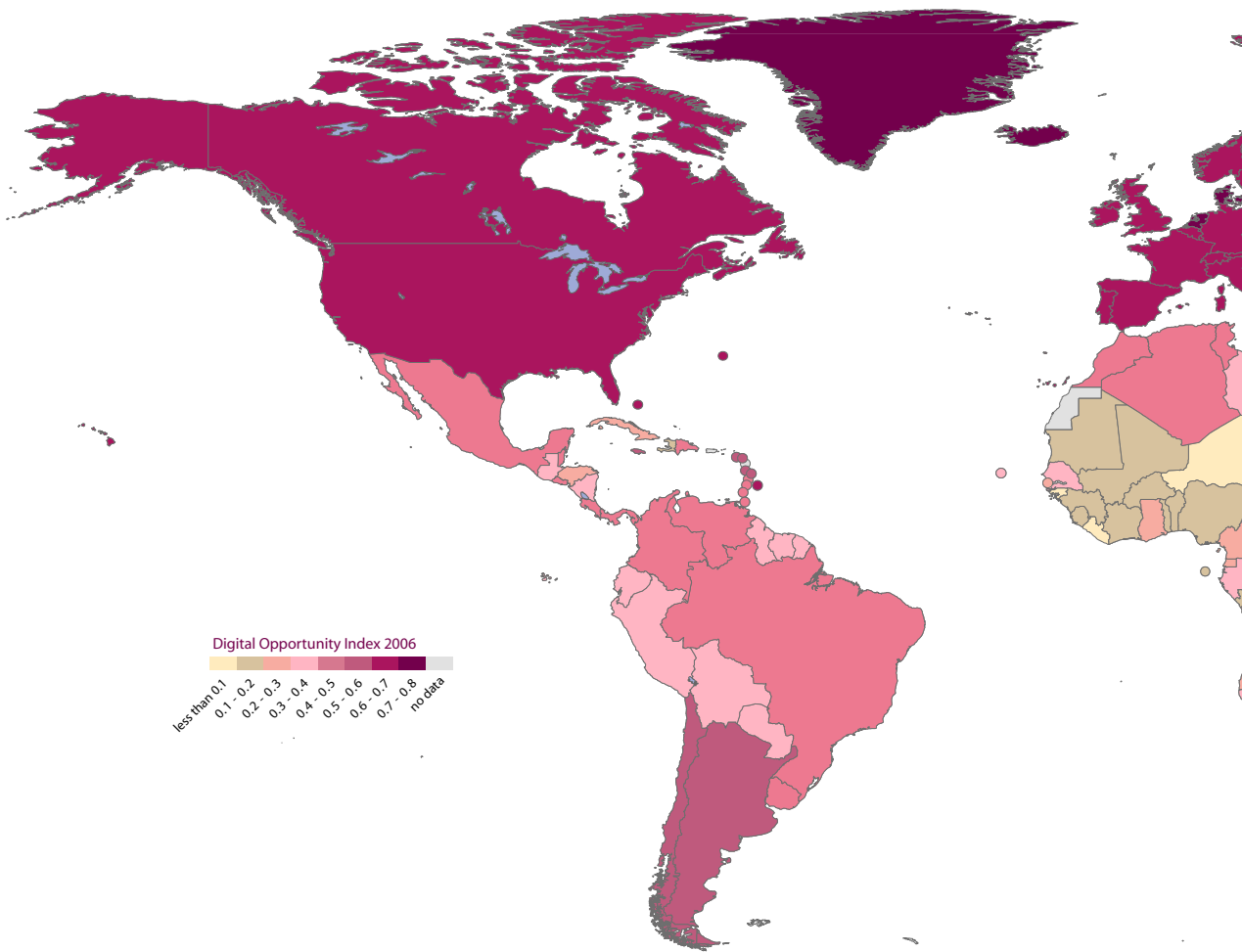
Mobile broadband is growing in speed and capabilities. By the first quarter of 2006, operators were advertising commercially available download velocities of between 384 kbit/s – 1.4 Mbit/s, with the industry promising even higher speeds in the near future. For example, Telstra, a mobile operator in Australia, claims that it will soon be providing peak network speeds of 14.4 Mbit/s over its HSDPA network.

Figure 6: Expansion of mobile Internet and 3G mobile broadband

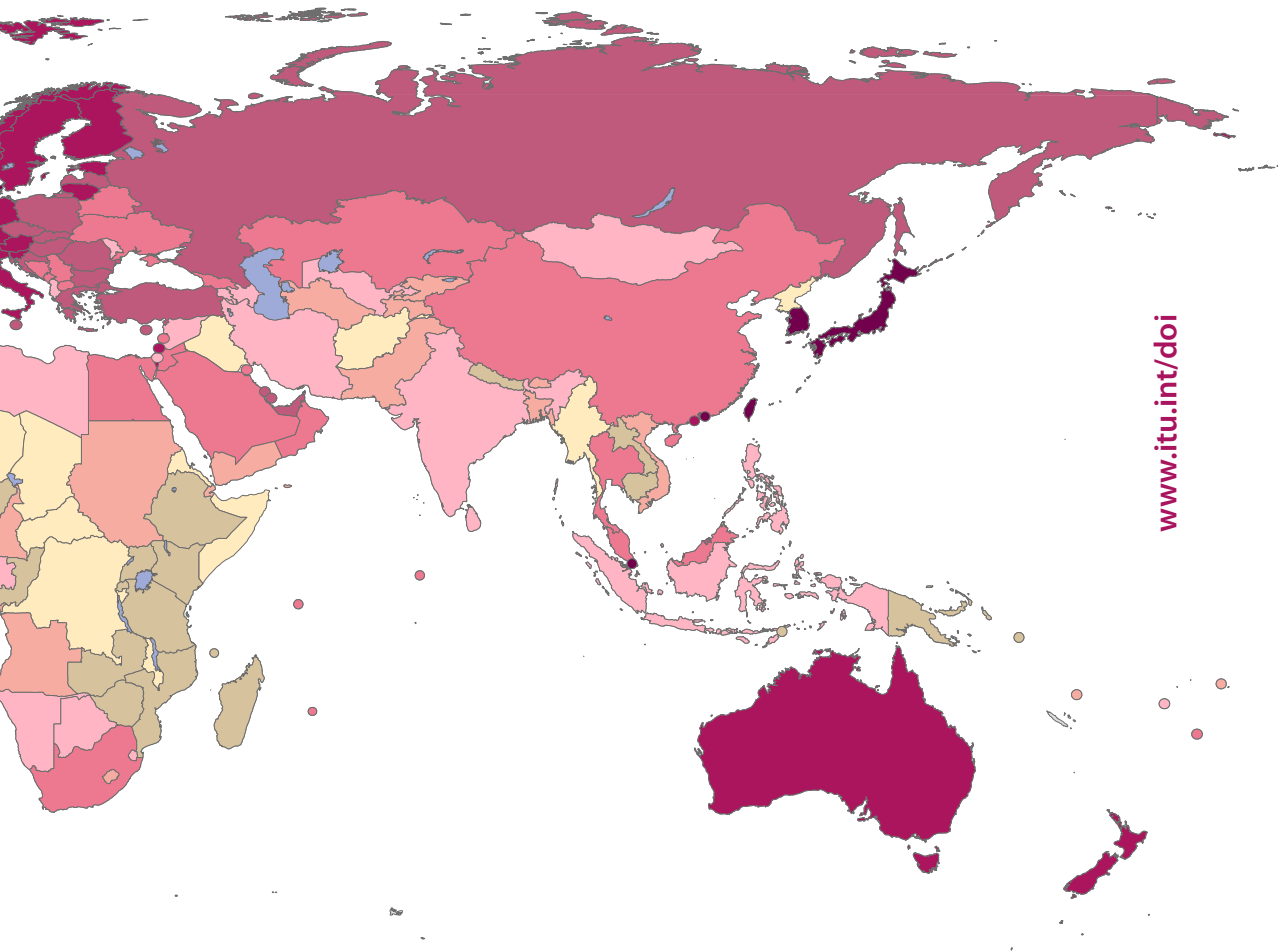


Source: ITU/UNCTAD/KADO Digital Opportunity Platform.

Digital opportunity worldwide, 2006



Source: ITU/UNCTAD/KADO Digital Opportunity Platform



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Egypt	91	0.41
Tonga	92	0.41
Lebanon	93	0.40
Kazakhstan	94	0.40
El Salvador	95	0.40
Peru	96	0.40
Ecuador	97	0.40
West Bank & Gaza	98	0.40
Fiji	99	0.39
Botswana	100	0.38
Azerbaijan	101	0.38
Philippines	102	0.38
Chad	103	0.38
Syria	104	0.37
Iran	105	0.37
Senegal	106	0.37
Albania	107	0.37
Guatemala	108	0.37
Ukraine	109	0.36
Sri Lanka	110	0.36
Moldova	111	0.35
Paraguay	112	0.35
Namibia	113	0.35
Sri Lanka	114	0.35
Cape Verde	115	0.34
Indonesia	116	0.34
Maldives	117	0.34
Guyana	118	0.33
Bolivia	119	0.33
Switzerland	120	0.32
Mongolia	121	0.32
Nicaragua	122	0.31
Uzbekistan	123	0.31
China	124	0.31
Sri Lanka	125	0.29
Vietnam	126	0.29
Pakistan	127	0.29
Yemen	128	0.28
Cuba	129	0.28
Honduras	130	0.27
Equatorial Guinea	131	0.27
Djibouti	132	0.26
Lesotho	133	0.26
Bangladesh	134	0.25
Kyrgyzstan	135	0.25
Sudan	136	0.24
Cameroon	137	0.23
Turkmenistan	138	0.22
Bhutan	140	0.21
Vanuatu	141	0.21
Ghana	142	0.21
Tajikistan	143	0.21
Gambia	144	0.21
Cote d'Ivoire	145	0.19
Benin	146	0.19
Nepal	147	0.19
Papua New Guinea	148	0.19
Cambodia	149	0.18
Lao PDR	150	0.18
Togo	151	0.17
Congo	152	0.17
Kenya	153	0.17
Mauritania	154	0.17
Nigeria	155	0.17
Comoros	156	0.17
Zimbabwe	157	0.16
Iganda	158	0.16
Sierra Leone	159	0.15
Haiti	160	0.15
Guinea	161	0.15
Tanzania	162	0.15
Zambia	163	0.14
Rwanda	164	0.14
Burkina Faso	165	0.14
South Africa	166	0.12
Madagascar	167	0.12
Mozambique	168	0.12
Malawi	169	0.12
Timor-Leste	170	0.11
Sierra Leone	171	0.11
Ethiopia	172	0.10
Equatorial Guinea	173	0.09
Central African Rep.	174	0.09
Malawi	175	0.09
Congo, D.R.	176	0.08
Eritrea	177	0.07
Guinea-Bissau	178	0.04
Myanmar	179	0.04
Yemen	180	0.04
Niger	181	0.03

Affordability

The Report also explores the affordability of ICTs in terms of prices for mobile service, Internet access and broadband for up to 181 economies around the world. The digital divide reflects structural differences in the economics of the access and wholesale markets. Low-income countries are less likely to have infrastructure-based competition in their broadband markets, whereas many high-income countries enjoy competitive markets with alternative products in cable modems and DSL.

In the wholesale market, low-income countries suffer from lack of supply, mainly due to barriers in cost. The small size of their Internet markets means that developing countries often cannot negotiate economies of scale in bulk purchases of international bandwidth. Access to submarine fibre-optic cables may also be limited. In Internet access, developing countries frequently bear the full costs of connection to the developed countries, where most content originates.

These differences result in the costs of broadband Internet access being far higher in many developing economies than in developed ones (see Figure 7). By contrast, there is almost no difference in prices between income groups for mobile service.

Figure 7: ICT prices by income group, 2006

Income group	Monthly basket of Internet use		Monthly basket of mobile use		Broadband Prices (USD per 100 kbit/s)	
	USD	% monthly per capita income	USD	% monthly per capita income	USD per 100 kbit/s	% monthly per capita income
High	\$22	0.9	\$15	0.7	\$16	2.1
Upper-middle	\$22	4.9	\$12	2.6	\$19	4.9
Lower-middle	\$24	19.7	\$11	7.6	\$93	71.8
Low	\$44	172	\$13	54.9	\$186	909
World	\$29	55.2	\$13	18.3	\$72	225.1

Methodological Note: The Internet basket is based on 10 hours of peak rate and 10 hours of off-peak use. Where applicable, telephone usage charges are included, but not the monthly rental of the telephone line. The mobile basket is based on the OECD low-user definition. Averages are not weighted, with each county in the income group having equal weight. For broadband tariffs, the price is calculated as the cost of 100 kbit/s broadband access per month based on a selection of representative offers for 100 hours per month (time-based packages) or 100 Mbit/s data download (for content-based packages).

Source: ITU/UNCTAD/KADO Digital Opportunity Platform.

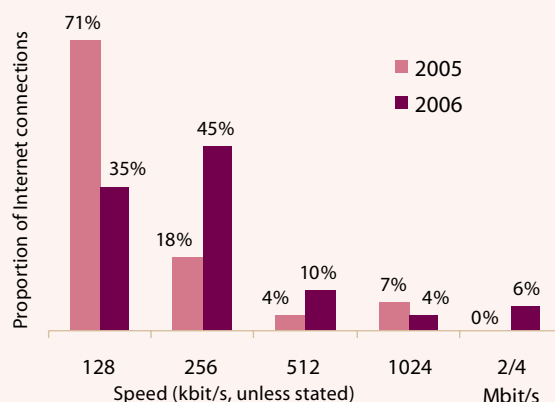
Box 2: Morocco – An African Success Story

Morocco initiated market liberalization relatively early for a developing country. In mobile communications, it became one of the first North African countries to introduce competition when it licensed a second mobile operator, Médi Telecom, in July 1999. A few months later in December 1999, the Government sold 35 per cent of incumbent Maroc Telecom to Vivendi of France. Intense competition between the two operators led to mobile phones overtaking fixed lines in August 2000, just six months after the second operator had launched its network. By June 2001, Médi had 755'000 customers and a population coverage of 70 per cent. Maroc Telecom responded by investing US\$ 275 million in its network and innovating its price strategy. It achieved a client base of one million customers in June 2000, two million in November 2000 and three million by May 2001. The recent growth in Morocco has significantly surpassed all its North African neighbours.

Now, some of the same dynamism is reaching the Moroccan Internet market. Helped by Morocco's proximity to fibre networks in the Mediterranean, Maroc Telecom and the ISP Menara have launched a range of high-speed packages at comparatively low prices, including the highest-speed broadband package in Africa at 4 Mbit/s. Surveys of the residential market carried out by the regulator, Agence Nationale de Régulation des Télécommunication (ANRT), show that broadband connections are moving to progressively higher speeds (see Figure 8).

Figure 8: Evolution in the speed of Internet access in Morocco

Proportion of Internet connections by speed, 2005 and 2006



With nearly 400'000 ADSL connections at the end of 2006, Morocco is the top country in Africa in terms of the number of broadband subscribers, well ahead of South Africa (although Mauritius had the highest broadband penetration). At the end of 2006, ADSL accounted for 98 per cent of all Moroccan Internet connections (including dial-up and leased lines). Broadband connections increased by 58 per cent over 2005-2006, compared to dial-up, which lost ground with a 40 per cent drop. These changes in the sector all helped Morocco to take the position of "fastest gainer" in the Digital Opportunity Index between 2004 and 2006.

Source: ITU/UNCTAD/KADO Digital Opportunity Platform, adapted from the Moroccan Agence Nationale de Régulation des Télécommunications (ANRT).

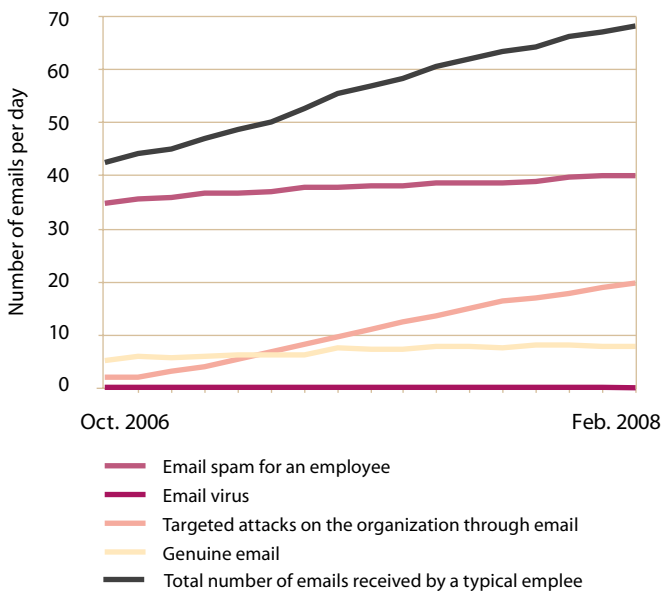
Cybersecurity

The Information Society is not without risks, and the Report examines the potential pitfalls of growth in the Information Society in rising online dangers and threats to cybersecurity (see Box 3). The expansion of the Internet is opening up many new opportunities for criminals to exploit online vulnerabilities to commit cybercrime acts or attack the countries' critical infrastructures.

Viruses, spyware, phishing, identity theft, zero-day exploits, denial of service attacks, zombie botnets and other vulnerabilities are endangering cyberspace and jeopardizing the very future of the Internet. With spam and other exploitation now accounting for up to 90 per cent of e-mail traffic over the Internet, these risks threaten to undermine user confidence and inhibit the growth of the online world. Spam has morphed from a general annoyance to a broader cybersecurity threat. It is now the primary mechanism for delivering viruses that can hijack millions of computers (via so-called "zombie botnets") or launch phishing attacks to capture private or corporate financial information. Spam also acts as a platform for many other types of scams (see Figure 9).

It is now widely recognized that cybercrime is the fastest-growing form of criminality, including new criminal offences in relation to computers (such as spam, viruses and

Figure 9: Development of threats to cybersecurity within firms



Source: ITU, adapted from MessageLabs.

hacking) and existing crimes committed using digital or computer technology (such as online fraud, harassment, etc.). Variations of spam are developing on different platforms such as spim (spam through instant messaging) and spit (spam associated with Internet telephony).

At the Tunis Phase of the WSIS, participants reaffirmed their commitment to deal effectively with the significant and growing problem posed by spam. WSIS Action Line C5 is dedicated to building confidence and security in the use of ICTs. Unless there is progress in building confidence and security in the use of ICTs, users' trust in the Internet may well diminish and this could limit its growth and potential. However, one problem that all cybercrime-fighters constantly face is that the criminal is always one step ahead. Developing countries are especially at risk when electronic networks are used for criminal purposes to harm the integrity of critical infrastructure within countries, as this creates further barriers to extending the benefits of ICTs.

Box 3: Threats in Cyberspace

Why they deserve increased attention

Cybersecurity is growing in importance due to:

- **Inherited architecture:** the Internet began as a closed network with a limited number of trusted users, so user authentication was not an issue. The design philosophy of the Internet is now several "generations" behind the latest technological changes (consider, for example, the issue with inherited architecture posed by the 'millennium bug').
- **Constant evolution in protocols and technology:** in the constant tug-of-war of human ingenuity, many encryption algorithms are eventually compromised.
- **Evolution of the network:** telecommunication networks are evolving towards Next-Generation Networks (NGNs) with decentralized intelligence at the edges of the network and separation of the control layer from the transport layer. The capacity and speed of networks are also increasing. In the absence of specific measures to address network security, the decentralization of intelligence to the edges of the network may make the network more vulnerable.
- **Convergence:** the combination of different ICTs in converged devices with multiple functions offers opportunities for 'cross-infection', with the problems of one technology feeding directly into other ICTs.
- **Size and scale effects:** the growth in the size of the network means that chain-reaction network effects are also growing, at an increasing pace.
- **Anonymity:** the lack of user authentication on the Internet means that it is easy to be anonymous and/or provide false identity information to misbehave online.
- **Internationalization:** the availability of the Internet in nearly every country in the world means that the legal framework may have difficulty keeping pace with technological developments - a chain is only as strong as its weakest link.

Source: ITU.

WSIS implementation

The **World Information Society Report 2007: Beyond WSIS** aims to track progress in implementing the outcomes of the WSIS. The year 2007 marks the second full year of implementation, following the successful conclusion of the Tunis Phase. More significantly, it represents a midway point between the formal adoption by the UN General Assembly of the WSIS as a Summit in two phases under the patronage of the UN Secretary-General in December 2001, and the review of the WSIS outcomes due to take place in 2015.

Due to the far-reaching nature of the Information Society, a comprehensive implementation plan is beyond the remit of any single UN agency. The resulting implementation plan operates on three levels:

- ▶ **National implementation** (para 100 of the *Tunis Agenda for the Information Society*) is being established through national implementation mechanisms, with individual governments taking the lead (see example of Singapore in Box 4).
- ▶ **Regional implementation** (para 101) involves the UN Regional Commissions and inter-governmental organizations, based on a multi-stakeholder approach.
- ▶ **International implementation** (para 102), which has three distinct components:
 - » Inter-agency coordination within the UN system (para 103-4), which is coordinated by the UN Group on the Information Society (UNGIS).
 - » The multi-stakeholder implementation process (para 108-110), which is coordinated through the work of action line facilitation groups. Many of these groups are meeting in Geneva during the WSIS cluster of meetings from 14-25 May 2007 (for more information see www.itu.int/wsisis/implementation).
 - » Follow-up (para 105), which is coordinated by the UN Economic and Social Council (ECOSOC) through the Commission for Science and Technology for Development (CSTD). This report will be presented at the tenth session of the CSTD, held in Geneva, 21-25 May 2007.

The WSIS adopted the principle of multi-stakeholder implementation. The WSIS stocktaking database (www.itu.int/wsisis/stocktaking) contains around 3'300 different entries on WSIS-related projects and programmes under way around the world. Some 55 per cent of these are conducted through partnerships. Although this concept is by no means new, it has permeated the WSIS process to a greater extent than in any previous UN Summit and is the cornerstone of WSIS implementation. One example is *Connect the World* partnership, launched by ITU in 2005, which now numbers more than 50 different partners representing governments, the private sector, civil society entities and inter-governmental organizations. This report is also produced by a multi-stakeholder partnership, the *Digital Opportunity Platform*.

Box 4: The age divide in Singapore

The Digital Opportunity Index (DOI) can be disaggregated by age, gender, area or region to investigate different aspects of the digital divide, as well as being used to study the divide between countries.

Using age-disaggregated data from the Singapore Infocomm Development Agency (IDA), the age divide for Singapore has been calculated. Not surprisingly, the 15-29 age group does best, with a Digital Opportunity score of 0.80 (see Figure 10), eight percentage points above the national average. Conversely, the 60+ age group lags behind the national average, by some nine percentage points. The total gap between young tech-savvy students and the elderly amounts to some 17 per cent, with the greatest gap in rates of Internet usage. The only area where the elderly (60+) did better than the youth of Singapore was in mobile broadband access, as a reflection of the greater disposable income of the retired. The vision of the Government of Singapore is to have “an infocomm-savvy workforce and globally competitive infocomm manpower to drive national economic competitiveness”. On the basis of digital opportunity among the young generation of tomorrow, Singapore’s future seems bright and assured. The Government of Singapore has introduced a comprehensive plan IN2015 that addresses the age divide among others.

Figure 10: The age divide in Singapore

AGE-DISAGGREGATED DOI	2005/06	15-29	45-59	60+
OPPORTUNITY	1.00	1.00	1.00	1.00
INFRASTRUCTURE	0.71	0.76	0.54	0.42
4. % households with a fixed-line telephone	0.98	0.98	0.98	0.98
5. % households with a computer	0.74	0.86	0.55	0.34
6. % households with Internet access at home	0.66	0.83	0.48	0.24
7. Mobile cellular subscribers per 100 inhabitants	0.98	0.87	0.61	0.38
8. Mobile Internet subscribers per 100 inhabitants	0.18	0.24	0.1	0.15
UTILIZATION	0.45	0.65	0.49	0.49
9. % individuals that used the Internet	0.49	0.83	0.48	0.24
10. Fixed broadband subscribers / total Internet subscribers	0.83	0.83	0.83	0.83
11. Mobile broadband subscribers / total mobile subscribers	0.04	0.28	0.16	0.39
DIGITAL OPPORTUNITY INDEX	0.72	0.80	0.68	0.63

Source: ITU/UNCTAD Digital Opportunity Platform, adapted from the Singapore Infocomm Development Agency (IDA).

Table 1: Mobile Market Data Top Twenty Largest Mobile Markets

Economy	Total mobile cellular subscribers (000s)	Of which, total mobile broadband subscribers (000s)	Penetration (per 100 inhabitants)	OECD mobile low-user basket (USD)
	2005	2005	2005	2006
1. China	393'428.0	*	29.9	\$2.90
2. United States	213'000.0	4'360.4	71.4	\$5.21
3. Russian Federation	120'000.0	*	83.6	\$5.87
4. Japan	96'484.0	17'792.6	75.3	\$20.42
5. India	90'000.0	*	8.16	\$2.45
6. Brazil	86'210.0	175	46.3	\$26.19
7. Germany	79'200.0	2'289.0	95.8	\$16.98
8. Italy	72'200.0	10'262.0	124.3	\$14.12
9. United Kingdom	65'500.0	4'536.8	109.8	\$13.71
10. France	48'099.0	1'583.0	79.5	\$29.36
11. Mexico	47'141.0	...	44	\$13.89
12. Indonesia	46'910.0	...	21.1	\$4.25
13. Turkey	43'609.0	*	59.6	\$12.72
14. Spain	41'327.9	939	96.8	\$21.66
15. Korea (Rep.)	38'342.3	12'530.9	79.4	\$14.18
16. Philippines	34'779.0	*	41.3	\$5.27
17. South Africa	33'960.0	216.1	71.6	\$13.82
18. Poland	29'166.4	12.9	75.7	\$7.63
19. Thailand	27'378.7	*	43	\$4.32
20. Taiwan, China	22'170.7	113.9	97.4	\$26.19
WORLD	2'187'312.8	60'249.1	34.3	\$12.77

Note: "Mobile Broadband" refers to services offering a download capacity of equal to, or greater than, 256 Kbit/s.

Source: ITU/UNCTAD Digital Opportunity Platform and ITU World Telecommunication Indicators Database.

Table 2: Broadband Market Data

Top Twenty Largest Broadband Markets

Economy	Total fixed broadband subscribers (000s)	Penetration (per 100 inhabitants)	As a % of Internet subscribers	Price (in USD per 100 kbit/s)
	2005	2005	2005	2006
1. United States	50'237.1	16.9	73.9	\$0.49
2. China	37'504.0	2.9	51.2	\$1.47
3. Japan	22'374.9	17.5	66	\$0.06
4. Korea (Rep.)	12'190.7	25.2	100	\$0.08
5. Germany	10'687.0	12.9	53.4	\$0.52
6. United Kingdom	9'864.0	16.5	63.1	\$0.63
7. France	9'449.0	15.6	71.3	\$0.37
8. Italy	6'780.0	11.7	38.5	\$0.31
9. Canada	6'429.0	19.9	80.4	\$1.08
10. Spain	4'994.3	11.7	90	\$4.89
11. Taiwan, China	4'340.9	19	54.1	\$0.18
12. Netherlands	4'100.0	25.2	58.6	\$0.14
13. Brazil	4'385.1	2.4	26.5	\$1.20
14. Mexico	1'876.3	1.8	47.7	\$6.24
15. Australia	2'102.8	10.4	35.2	\$3.41
16. Belgium	2'004.9	19.4	91.7	\$1.22
17. Sweden	1'931.0	21.4	58.5	\$0.24
18. Switzerland	1'631.8	21.9	62.7	\$1.57
19. Hong Kong, China	1'659.1	23.6	63.0	\$0.83
20. Turkey	2'253.1	2.2	70.6	\$9.85
WORLD	216'708.6	3.4	56.2	\$76.01

Note: "Fixed Broadband" is considered any dedicated connection to the Internet of 256 kbit/s or faster.

Source: ITU/UNCTAD Digital Opportunity Platform and ITU World Telecommunication Indicators Database.

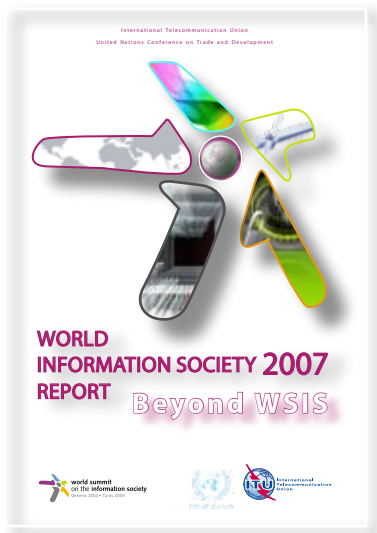


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The full report will be available at www.itu.int/wisr and www.unctad.org/wisr.

