



chapter one

Introduction

1.1 The WSIS Commitment

The World Summit on the Information Society (WSIS) was a United Nations Summit held in two phases in Geneva (December 2003) and Tunis (November 2005).¹ It was convened in response to rising awareness of the pervasive power of Information and Communication Technologies (ICTs) and growing concerns that developing countries should not be left behind in the new Information Society. The WSIS resulted in a remarkable commitment:

"We are ... fully aware that the benefits of the information technology revolution are today unevenly distributed between the developed and developing countries and within societies. We are fully committed to turning this digital divide into a digital opportunity for all, particularly for those who risk being left behind and being further marginalized" (WSIS Geneva Declaration of Principles, Para 10).²

This commitment by world leaders, to turn the digital divide into a digital opportunity for all, will be severely tested over the next decade or so, as dozens of new ICT services and applications are rolled out at an ever-accelerating pace. Is it really possible to ensure that the latest ICTs do not reinforce existing divisions between information-rich countries and the information-poor? Can we ensure that existing inequalities do not take on new and far-reaching dimensions in the dawning knowledge society?

This is an extremely important issue, which is far from simply a question of who has access to the most high-tech gadgets. At the World Summit, leaders from every country recognized the fundamental role that ICTs can play in promoting economic growth, social development and cohesion, as well as a sense of cultural identity. ICTs can help create new jobs, while transforming firms and streamlining work practices. The ability to use ICTs is a key skill that increasingly determines the employability and standard of living of many citizens. Access to ICTs now drives access to information and knowledge, which, in turn, can decide access to wealth and affluence. A society in which a significant part of the population feels excluded from the benefits that ICT access brings is a society that is fundamentally insecure, at peril of social disintegration.

This series of reports – the World Information Society Reports, published by ITU, UNCTAD

and other members of the Digital Opportunity Platform (see Box 1.1) – was launched in 2006³, following the Tunis Phase of the Summit. These Reports track progress in implementing the outcomes of the WSIS and assess the extent to which the digital divide is being turned into digital opportunity for all.

1.2 Measuring the Information Society

One of the challenges for the international community identified by the WSIS was the development of a methodology for measuring the Information Society. The Geneva Plan of Action called for:

"A realistic international performance evaluation and benchmarking (both qualitative and quantitative), through comparable statistical indicators and research results..." (Para 28).

It also called for the development of:

"A composite ICT Development (Digital Opportunity) Index. It could be published annually, or every two years, in an ICT Development Report. The index could show the statistics while the report would present analytical work on policies and their implementation, depending on national circumstances, including gender analysis" (Para 28a).

Between 2003 and 2005, much work was carried out, notably within the UN system, in response to this challenge. In November 2005, during the Tunis Phase of the Summit, governments and other stakeholders recognized a number of elements in an "agreed methodology" (Tunis Agenda, Para 112):

- » Appropriate indicators and benchmarking for tracking the digital divide (Para 113 of the Tunis Agenda; see Chapters two and three of this Report);
- » The launch of the Partnership on Measuring ICT for Development (Para 114; see Box 1.2);
- » The launch of two composite indices—the ICT Opportunity Index (ICT-OI) and the Digital Opportunity Index (DOI)—based on the common set of core indicators proposed by the Partnership (Para 115).

Box 1.1: The Digital Opportunity Platform and its work

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. Inspired by the WSIS, the Partnership has committed to make a real contribution to the creation of a people-centered, inclusive and development-oriented information society driven by ICTs.

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 DOP provides all stakeholders with a powerful and easy-to-use tool—the Digital Opportunity Index (DOI, www.itu.int/doi)—one of the two indices endorsed by WSIS in the Tunis Agenda for the Information Society (Para 115). Measurement of the digital divide based on reliable benchmark evidence informs policy-making and maximizes the benefits of ICTs, especially for developing countries. 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.

The DOP holds an annual Forum – the Digital Opportunity Forum (www.itu.int/dof) – uniting ICT policy-makers, researchers and experts from governments, regulatory agencies and academic institutions from different countries, as well as international and regional organizations. The Forum is an incubator for ideas and innovation on sustainable development using ICTs and it provides a wealth of resources freely available on the internet. Other conferences organized under the DOP in 2006 to frame further constructive work on specific themes include the joint ITU/London Business School conference on Digital Transformations in the Information Society, held in June 2006.⁴

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 turning the digital divide into digital opportunity for all.

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

- » The need to take into account national circumstances (Para 116), avoid duplication (Para 117), further develop national statistical capacity (Para 118) and commit to bridging the digital divide (Para 119);
- » The launch of the Stocktaking database and Golden Book of WSIS-related activities which should continue to be maintained by ITU (Para 120; see Chapter six).

This Report corresponds to the annual Report requested in Para 28a. In response to the need identified by the Summit, it evaluates and benchmarks international digital opportunity in terms of access to the benefits of the Information Society. It considers digital opportunity broadly and matches evidence of startling growth with a consideration of the potential downside and threats to the Information Society.

1.3 Towards a single composite index of ICT development

1.3.1 WSIS-endorsed composite indices

In its work on statistics for measuring the Information Society, ITU has been involved with both the composite indices endorsed by the Tunis Phase (Tunis Agenda, Para 115):

- » The Digital Opportunity Index (DOI)⁵ was developed by a multi-stakeholder partnership, the Digital Opportunity Platform (highlighted in Box 1.1), whose members include ITU, UNCTAD, MIC Korea, KADO, UNESCWA, LBS, LIRNEAsia and LINKAfrica. It is based on

Box 1.2: The Partnership on Measuring ICT for Development

The World Summit on the Information Society (WSIS) affirmed the need for more comprehensive and reliable statistical information to measure the information society and called for the development of “appropriate indicators and benchmarking ... [to] clarify the

magnitude of the digital divide...” (WSIS Geneva Plan of Action, Para 28b). The Partnership on Measuring ICT for Development was launched during UNCTAD XI in June 2004 by the ITU, UNCTAD and a number of other stakeholders. It currently represents the most comprehensive effort to develop, collect and disseminate globally relevant indicators to measure the Information Society.



As an international, multi-stakeholder initiative, the Partnership provides an open framework for coordinating ongoing and future activities, and for developing a coherent and structured approach to advancing the development of ICT indicators globally, in particular in developing countries. It includes ITU, OECD, EUROSTAT, UNCTAD, UNESCO Institute for Statistics (UIS), four UN Regional Commissions (ECA, ECLAC, ESCAP and ESCWA), the UN ICT Task Force/GAID and the World Bank. Some National Statistical Offices (NSOs) from developed countries contribute to the Partnership’s activities by providing expertise and advice to NSOs from developing countries. The Partnership is also actively involved in the transfer of knowledge in areas such as definitions, methodologies and household and business surveys. Its core objectives are:

- 1) To achieve a common set of core ICT indicators, to be harmonized and agreed upon internationally. A first core list, which was agreed upon in February 2005, includes a total of 42 indicators and reflects key actors in the information society – individuals, households, and enterprises. A number of indicators on “ICTs in Education” are expected to be adopted soon. The Partnership plans to extend the list over time to cover more sectors (health, government, etc), and eventually ‘impact’ indicators.
- 2) To assist in building statistical capacity in developing countries. A key objective of the Partnership is to enhance the capacities of NSOs in developing countries and to build competence to develop statistical compilation programmes. Based on a stocktaking-exercise to identify capacity building needs in developing countries, the Partnership has held regional workshops on ICT indicators in Asia-Pacific, Latin America, Western Asia and Africa, to exchange national experiences and discuss methodologies, definitions, surveys, etc. Technical assistance is based on countries’ commitment to using recommended indicators from the Partnership’s core list.
- 3) To develop a global database on ICT indicators and to make data available over the Internet.

The Partnership has published a number of publications on the availability of ICT data, as well as methodological material that helps guide developing countries in their data collection efforts. A global Partnership report and meeting are planned for the second half of 2007.

Box Table 1.1: Partnership on Measuring ICT for Development’s core list of ICT indicators, April 2007

ICT infrastructure and access	Data have been collected by ITU (from official country contacts, primarily regulatory agencies and Ministries) for many years and are largely available for the majority of countries. Indicators include fixed telephone lines, mobile cellular subscribers, Internet and broadband subscribers, international Internet bandwidth, and tariff indicators.
Access to, and use of, ICTs by households and individuals	Data have been collected (from National Statistical Offices) by ITU since 2005 but availability of data is scarce. While the large majority of countries have information on basic ICT equipment in households (TV and fixed lines), data on more recent technologies are lacking. Major regional differences exist. Indicators include households with a radio, a TV, a fixed telephone line, a mobile cellular telephone and a PC. Indicators on location, type, and purpose of Internet use are also included.
Use of ICT by businesses	Data are collected by UNCTAD and include indicators on businesses and employees using PCs, the Internet and e-commerce activities.
ICT sector and trade in ICT goods	Data have been collected by UNCTAD since 2004 and include indicators on ICT goods imports and exports, as well as the ICT sector’s value-added.

Source: Further information about the Partnership on Measuring the Information Society is available at: www.itu.int/ITU-D/ict/partnership/ and <http://measuring-ict.unctad.org>.

Table 1.1: The Digital Opportunity Index (DOI) and the ICT Opportunity Index (ICT-OI)

Comparison of the indicators included in the two composite indices endorsed by the Tunis Phase of the WSIS.

<i>Digital Opportunity Index (DOI)</i>	<i>ICT Opportunity Index (ICT-OI)</i>
Opportunity	Info density: Networks
1. Percentage of population covered by mobile telephony	1. Main telephone lines per 100 inhabitants
2. Internet access tariffs as a percentage of per capita income	2. Mobile cellular subscribers per 100 inhabitants
3. Mobile cellular tariffs as a percentage of per capita income	3. International Internet bandwidth (kbit/s per inhabitant)
Infrastructure	Info density: Skills
4. Proportion of households with a fixed-line telephone	4. Adult literacy rates
5. Proportion of households with a computer	5. Gross enrolment rates (primary, secondary and tertiary)
6. Proportion of households with Internet access at home	Info use: Uptake
7. Mobile cellular subscribers per 100 inhabitants	6. Internet users per 100 inhabitants
8. Mobile Internet subscribers per 100 inhabitants	7. Proportion of households with a TV
Utilization	8. Computers per 100 inhabitants
9. Proportion of individuals that have used the Internet	Info use: Intensity
10. Ratio of fixed broadband subscribers to total Internet subscribers	9. Total broadband Internet subscribers per 100 inhabitants
11. Ratio of mobile broadband subscribers to total mobile subscribers	10. International outgoing international traffic (minutes) per capita

Note: The indicator "Mobile cellular subscribers per 100 inhabitants" appears in both indices.

Source: ITU.

eleven separate indicators in three clusters of opportunity, infrastructure and utilization. It has a modular structure and can be split into fixed and mobile components. The index was launched at WSIS in November 2005 and the first full release (180 economies) appeared in last year's World Information Society Report. This Report presents the second full edition of the DOI (see Chapter three of this Report and Table 1 in the Statistical Annex).

- » ITU's ICT Opportunity Index (ICT-OI)⁶, which was developed by ITU and other organizations, is an analytical tool to track the digital divide by measuring the relative difference in ICT Opportunity levels among economies, and over time. The ICT-OI, which provides measurement across 183 economies, relies on ten indicators that help measure ICT networks, education and skills, uptake

and intensity of the use of ICT. For analytical purposes, economies are grouped into four categories, ranging from high to low ICT Opportunities. Apart from cross-country comparisons, the index's methodology highlights relative movements between 2001 and 2005 (see Chapter seven of this Report and Table 4 in the Statistical Annex).

Both indices draw upon the core set of ICT indicators developed by the Partnership for Measuring ICT for Development. Nevertheless, there is relatively little overlap in the indicators chosen (see Table 1.1). Only one indicator (mobile cellular subscribers per 100 inhabitants) appears in both indices. For this reason, both indices illustrate different aspects of the digital divide. For instance, the DOI includes tariffs and advanced services (such as mobile broadband), whereas the ICT-OI focuses on more traditional ICTs (such as tel-

evision) and includes measures of literacy and school enrolment. Although neither index uses weights, the DOI expresses scores between 0 and 1, whereas the ICT-OI has no theoretical maximum. Furthermore, the DOI uses arithmetic average scores, whereas the ICT-OI uses a geometric mean. For 2005-06, the highest score in the DOI was the Republic of Korea with 0.80, whereas for the 2005 ICT-OI, it was Sweden with 377.

Despite their different methodologies, there is a high correlation between the ICT-OI and the DOI with a correlation (R-squared) coefficient equal to 0.94, suggesting that the two indices are consistent in their measurement of digital opportunity. This high correlation arises because both indices are, in turn, related to underlying variations in wealth and income.

1.3.2 Other composite indices

Although the DOI and the ICT-OI were the two composite indices noted in the WSIS outcome documents, they are by no means the only ones available.⁷ Other indices include:

- » The ICT Diffusion Index, developed by UNCTAD in the context of its support of the UN Commission for Science and Technology for Development (CSTD) and first published in 2003. The most recent edition was published in 2006 in the UNCTAD Digital Divide Report 2005⁸, with data from 1997 to 2004 for a total of 180 economies. The index contains eight indicators clustered into two categories of connectivity and access. (The scores and rankings are shown in Table 4 of the Statistical Annex).
- » The Network Readiness Index, published by the World Economic Forum (WEF) and INSEAD, and launched in 2002. The 2006 edition covers 122 economies and appears in the "Global Information Technology Report".⁹ The index uses a mix of hard data and subjective ratings obtained from surveys. The methodology is similar to that used for the WEF/INSEAD Global Competitiveness Report. (The scores and rankings are shown in Table 4 of the Statistical Annex).

These composite indices measure different aspects of the Information Society. Over the long-term, it is ITU's intention to develop a single ICT index, as requested in Resolution 131 (Antalya, 2006).

1.4 Conclusions: Structure of the report

This World Information Society Report tracks progress in implementing the outcomes of the WSIS and assesses the extent to which the digital divide is being turned into digital opportunity for all. In doing so, it directly responds to the request by the Geneva Plan of Action for international performance evaluation and benchmarking.

- » In Chapter two, a range of techniques are used to assess the digital divide from different perspectives. The analysis suggests that the digital divide is a complex concept reflecting underlying inequality in wealth and incomes. The divide is also strongly differentiated by technology, with the more recent technologies (such as broadband Internet) being the most unevenly diffused. However, bold moves in telecom sector reform and the huge strides being made by developing countries such as China promise greater access to ICTs by more people, in line with the objectives of the WSIS.
- » In Chapter three, the Digital Opportunity Index 2006 is used to track the growth of the Information Society and analyze which economies are making the greatest progress in digital opportunity. The DOI monitors eleven indicators for 181 economies, including trends in price data and broadband Internet access (fixed and mobile). Digital opportunity is growing strongly around the world and there are encouraging gains among developing countries – five out of the top ten gainers in the DOI are from Africa. DOI scores since 2000/1 are used to examine key trends shaping the future Information Society, as consumers "cut the cord" and move to mobile; the relentless spread of broadband and slow death of dial-up Internet access; and rapid growth in 3G mobile telephones.
- » In Chapter four, individual country strategies for developing the ICT sector are examined. Successful examples of ICT strategies are highlighted for the broader experience they may offer to policy-makers in other countries. The DOI is a tool for policy analysis, as it can be used to highlight aspects of a country's ICT framework (e.g. opportunity, infrastructure or utilization) where any given country is doing better or worse than its peers. In last year's Report, the DOI was used to benchmark

the extent of the gender divide in the Czech Republic and urban/rural regional divides in Brazil. In this year's Report, the DOI is used to assess the extent of the age divide in Singapore.

- » In Chapter five, we examine some of the challenges faced in building a safe and secure Information Society. The deployment of new technologies opens the door to new threats, along with the good. As ICTs offer ever greater power and performance, the damage

that ICTs can be used to inflict also grows. As usage of ICTs increases, the typical user is less likely to be a specialist, and may be less aware of the need to ensure security and data privacy. The WSIS process identified cybersecurity as one of the eleven principles or Action Lines for building a people-centred, inclusive and development-oriented Information Society. This Chapter examines some of the steps being taken to promote a global culture of cybersecurity.

Table 1.2: WSIS action lines, themes and their focal points

Action Line	Possible moderators/facilitators
C1. The role of public governance authorities and all stakeholders in the promotion of ICTs for development	ECOSOC/ UN Regional Commissions/ ITU/ UN DESA
C2. Information and communication infrastructure	ITU / APC
C3. Access to information and knowledge	ITU/ UNESCO / <i>FAO/ UNIDO</i>
C4. Capacity building	UNDP / UNESCO/ ITU/ UNCTAD/ <i>UN DESA/ FAO/ UNIDO</i>
C5. Building confidence and security in the use of ICTs	ITU
C6. Enabling environment	ITU/ UNDP / UN Regional Commissions/ UNCTAD/ <i>UN DESA/ UNIDO/ APC</i>
C7. ICT Applications	
• E-government	UNDP/ ITU/ UN DESA
• E-business	WTO/ UNCTAD / ITU/ UPU/ <i>ITC</i>
• E-learning	UNESCO / ITU/ UNIDO
• E-health	WHO / ITU
• E-employment	ILO / ITU/ <i>ITC</i>
• E-environment	WHO/ WMO / UNEP/ UN-Habitat/ ITU/ ICAO
• E-agriculture	FAO / ITU
• E-science	UNESCO / ITU/ UNCTAD/ <i>WHO</i>
C8. Cultural diversity and identity, linguistic diversity and local content	UNESCO
C9. Media	UNESCO
C10. Ethical dimensions of the Information Society	UNESCO / ECOSOC
C11. International and regional cooperation	UN Regional Commissions / UNDP/ ITU/ UNESCO/ ECOSOC/ UN DESA

Notes: For more information, including planned meetings, see www.itu.int/wsis/implementation. Those agencies shown in purple are the focal point for each action line, confirmed by action line facilitation meetings. Additional co-facilitators (not included in the Annex of the Tunis Agenda for the Information Society) are in italics.

Source: WSIS.

- » Chapter six presents an overview of progress in implementing the WSIS goals and describes activities and projects underway around the world to promote participation in the Information Society. It presents a number of ICT success stories and highlights the role of multi-stakeholder partnerships in shaping our common future. It examines how ICTs can be used to promote digital opportunity and extend access to ICTs, especially in education, telemedicine and telecentres in developing countries.
- » Chapter seven provides the background, methodology, conceptual framework and results of the 2007 release of the ICT Opportunity Index. The index is based on ten indicators and covers 183 economies, classifying them into four categories: high, upper, medium, and low. The ICT-OI shows that significant progress has been made across almost all economies and all areas of the telecommunication/ICT sector since 2001. At the same time, its results highlight that between 2001 and 2005, the divide increased between those economies that already have very high ICT levels and the rest of the world. It decreased between the medium group and the low group. Chapter seven is based on an extract from ITU's publication, "Measuring the Information Society 2007", which was published in February 2007.
- » Finally, chapter eight provides a summary of the main findings of the report.

Chapters five and six of this report focus on two of the eleven Action Lines agreed for WSIS follow-up, namely communication infrastructure (C2) and building confidence and security in the use of ICTs (C5). These are the two Action Lines for which ITU was given the primary responsibility for facilitating the multi-stakeholder implementation process (see Table 1.2).

The time horizon covered by the report looks back to the WSIS preparatory process, which began in 2002, and looks forward to 2015, the date by which the WSIS commitments should be fulfilled. This Report, the second in the series, is published roughly midway between 2000 and 2015 and offers a good opportunity to reflect on the goals set and the strategies for WSIS implementation. The report will be made available to the WSIS-related meetings due to take place in Geneva from 14-25 May 2007, as well as for the annual meeting of the UN Commission on Science and Technology for Development (UN CSTD), a functional commission of ECOSOC, which will take place from 21-25 May 2007, also in Geneva. ECOSOC has been given the mandate by WSIS to oversee the UN system-wide follow-up of the Geneva and Tunis outcomes of WSIS (Tunis Agenda for the Information Society, Para 105).

It is the sincere hope of the authors of this Report – the Digital Opportunity Platform – that it will prove an invaluable input and stimulus to WSIS implementation and that it will contribute to the building of a people-centred and development-oriented and inclusive Information Society for all.

Notes for Chapter One

- ¹ For more information on the World Summit on the Information Society (WSIS), see www.itu.int/wsis.
- ² The full text of the WSIS outcome documents is available online at: www.itu.int/wsis/documents/doc_multi.asp?lang=en&id=2316.
- ³ The text of the 2006 inaugural edition of the World Information Society Report is available at: www.itu.int/osg/spu/publications/worldinformationsociety/2006/report.html.
- ⁴ The proceedings of the ITU/London Business School workshop on Digital Transformations in the Information Society, Geneva, 1-2 June 2006, are available online at: www.itu.int/osg/spu/dtis/meeting.phtml.
- ⁵ For more information on the Digital Opportunity Index, see www.itu.int/doi.
- ⁶ For more information on the ICT-OI, see: www.itu.int/ITU-D/ict/publications/ict-oi/2007/index.html.
- ⁷ For a more complete discussion of available indices, see Chapter one of the 2006 edition of the World Information Society Report, available at www.itu.int/wisr.
- ⁸ The UNCTAD "Digital Divide Report: ICT Diffusion Index 2005" is available for download at: www.unctad.org/en/docs/itepc20065_en.pdf.
- ⁹ For more information on the WEF/INSEAD Global Information Technology Report 2007, see: www.weforum.org/en/media/Latest%20Press%20Releases/gitr_2007_press_release.