

# 7

## Information and communication technology



### 7.1 Information and communication technology development

## OVERVIEW

The diffusion of information and communication technologies (ICT) across countries is highly uneven, and regional rankings show considerable polarization. Developed countries consistently capture the top spots, while African and South Asian countries are falling behind. However, regional average rankings may mask great diversity among countries. For example, East Asia includes ICT leaders such as Hong Kong, SAR of China, and Singapore, as well as trailing countries such as Cambodia, the Lao People's Democratic Republic and Myanmar. In sub-Saharan Africa, countries like Mauritius and South Africa are gaining ground, while the majority of the countries in the region are lagging behind.

Even if there is a relationship between economic growth and the **Index of ICT Diffusion**, countries with similar income levels may have different rankings, which highlights the importance of policy choices.

Indices show relatively consistent rankings over time, although an analysis of movements in country rankings and of the distribution of computer hardware shows a small reduction in inequality across countries. This trend applies especially to older technologies such as fixed-line telephony and to leapfrogging in mobile telephony, suggesting that mobile telephone technology can help bridge the **digital divide**.

## DEFINITIONS

- The **Index of ICT Diffusion** developed by UNCTAD is designed to evaluate ICT diffusion across countries. It measures the average achievements in a country along three dimensions:

- Connectivity, as measured by per-capita numbers of Internet hosts, personal computers, telephone mainlines and mobile subscribers.
- Access, as measured by the estimated number of Internet users, the adult literacy rate, the cost of a local call and GDP per capita.
- Policy, as measured by the presence of Internet exchanges, levels of competition in local-loop and domestic long-distance telecommunications, and the level of competition in the Internet service provider market.

An index score is calculated for each of these indicators by applying the formula: value achieved / maximum reference value. Connectivity, Access and Policy indices are then calculated by averaging the index scores of their respective components. The Index of ICT Diffusion is an average of these three dimensions.

- The term **digital divide** refers to the gap between individuals, households, businesses, countries and geographic areas at different socio-economic levels with regard to both their opportunities to access information and communication technologies (ICTs) and to their use of the Internet for a wide variety of activities.

## DATA SOURCES

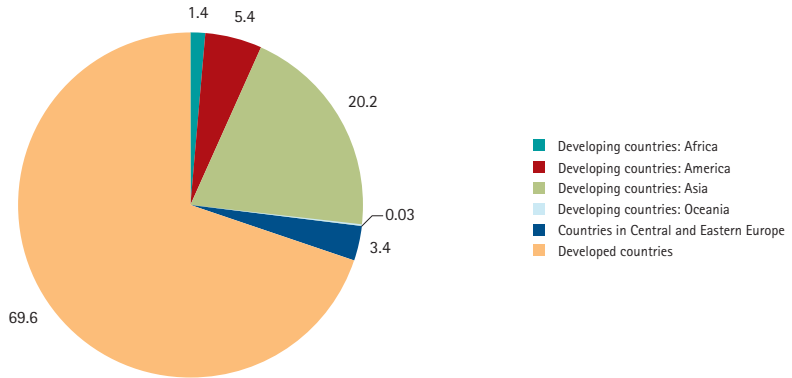
[1] ITU *World Telecommunication Indicators 2003* (including data on Internet hosts, personal computers, cellular mobile telephone subscribers, and main telephone lines in operation).  
United Nations, Statistics Division.

Official statistics on access to and use of ICT are scarce. Limited supply-side data on Internet access, hosts and users are available from national sources and are collected by the International Telecommunication Union (ITU).

ICT development indices were developed by UNCTAD in conjunction with the work programme of the Commission on Science and Technology for Development for the inter-sessional period 2001–2003 on “Technology Development and Capacity-Building for Competitiveness in a Digital Society”. Publications, studies and an indicators database can be downloaded from the *Science and Technology for Development Network* at [www.unctad.org/stdev](http://www.unctad.org/stdev).

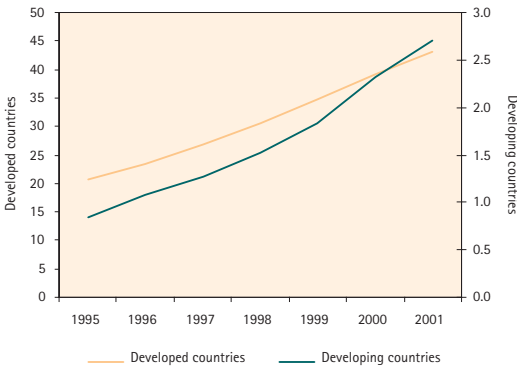
## Estimated share of Internet users in 2001 [1]

(in %)

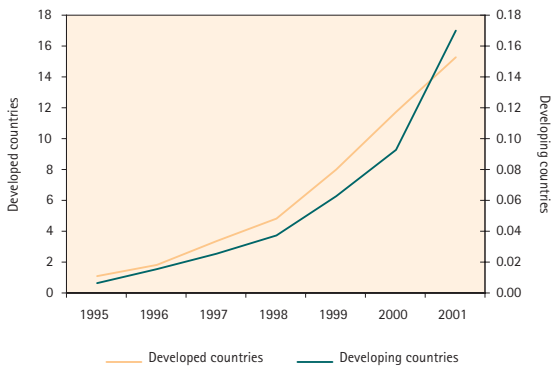


## The digital divide: PCs and hosts [1]

Number of PCs per 100 inhabitants

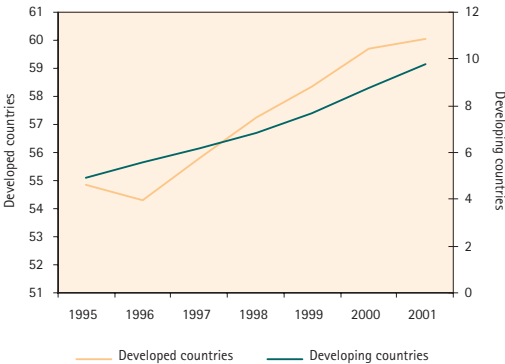


Number of hosts per 100 inhabitants

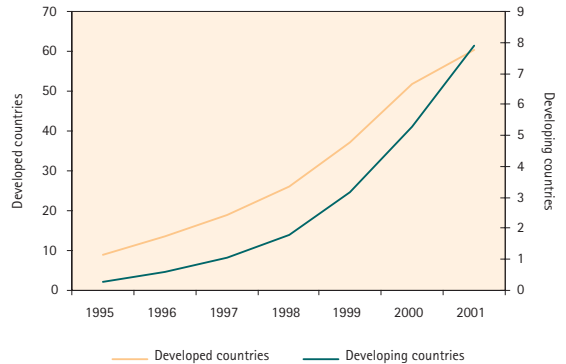


## The digital divide: telephones [1]

Number of mainlines per 100 inhabitants



Number of cellular telephones per 100 inhabitants



## OVERVIEW

The use of information and communication technology (ICT) by enterprises – or **e-business** – is closely linked to the growth of the Internet. The global number of **Internet users** grew 26% between 2001 and 2002. In 2001, 27% of Internet users were from developing countries, a figure that rose to 32% of the world's 591 million Internet users in 2002. By the year 2008, 50% of total Internet users could be in developing countries. Particularly significant growth is foreseen for Asia.

In 2002, 95% of **e-commerce** took place in developed countries, with Africa and Latin America together accounting for less than 1%. However, the beginnings of a rapid expansion of e-commerce, mainly business to business (B2B), are foreseen in the developing world, albeit again concentrated in key exporting developing countries.

The United States is by far the largest user of e-commerce. In 2001, annual B2B online sales in the United States totalled 995 billion US\$. The value of e-commerce in the European Union in 2002 was estimated at around 185 billion to 200 billion US\$. In Central and Eastern Europe, B2B e-commerce amounted to about 4 billion US\$ in 2003. In the Asia-Pacific region, it was expected to grow rapidly, to about 200 billion US\$ in 2003. In Latin America, 6.5 billion US\$ of online B2B transactions were forecast for 2002 and 12.5 billion for 2003. African B2B e-commerce was expected to amount to 0.5 billion US\$ in 2002 and 0.9 billion in 2003, with South Africa accounting for 80% to 85% of these figures.

In the area of business-to-consumer (B2C) e-commerce, estimates of total online retail sales for 2002 were 43.5 billion US\$ for the United States (73 billion including travel), 28.3 billion US\$ for the European Union, 15 billion US\$ for the Asia-Oceania region, 2.3 billion US\$ for Latin America and as little as 4 million US\$ for Africa.

## DEFINITIONS

- **E-business** covers a range of business activities or processes carried out over computer-mediated networks. It can be intra-firm or extra-firm and can include customer acquisition and retention; e-commerce; finance, budget and account management; human resource management; product design and development; order fulfilment and tracking; logistics (inbound and outbound) and inventory control; and product service and support.
- **Internet users** are the people in a particular country who have used the Internet at any point during a given year. An Internet host is a computer that is connected to the Internet at a given moment and has an Internet protocol (IP) address. Not all hosts are servers, and a server may host one, several or even hundreds of sites.
- **E-commerce** is the sale and purchase of goods and services over the Internet by businesses, households, individuals, governments and other public-private organizations. The goods and services are ordered over networks, but payment and final delivery of the good or service may occur offline or online.

## DATA SOURCES

- [1] UNCTAD, *E-Commerce and Development Report* (2002 and 2003 editions).
- [2] International Telecommunication Union (ITU).
- [3] Organization for Economic Co-operation and Development (OECD).

While e-business- and e-commerce-related statistics are collected in some developed countries, in most developing countries they are not yet available. Currently available data at the global level come from private data providers.

There is growing interest worldwide in developing ICT indicators. So far most of the conceptual, definitional and methodological work on measuring e-commerce and e-business has been done in the OECD Working Party on Indicators for the Information Society. UNCTAD is disseminating the results of this undertaking to developing countries and assisting their efforts to develop statistical compilation programmes. The site [measuring-ict.unctad.org](http://measuring-ict.unctad.org) follows developments in this area and includes an online forum enabling practitioners worldwide to share information and experiences on ICT statistics. UNCTAD's annual *E-Commerce and Development Report* surveys the latest data on ICT and e-business and provides comprehensive analysis of ICT use in development-related areas. See also [ro.unctad.org/ecommerce](http://ro.unctad.org/ecommerce).

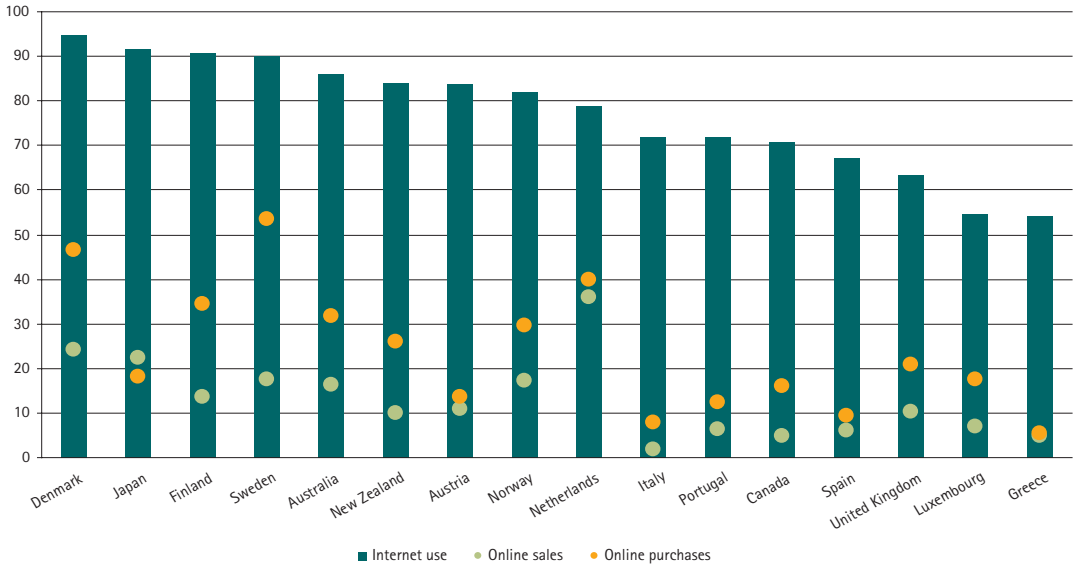
**Total e-commerce forecast [1]**

Share in %, total e-commerce in billion US\$ and annual growth in %

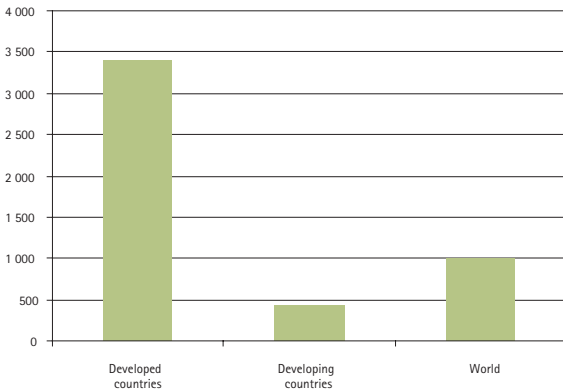
Regions	Share in % and total e-commerce in billion US\$				Compound annual growth rate 2002 - 2006
	2002		2006		
World	100.0	2 293.5	100.0	12 837.3	53.8
Developing countries	4.2	95.7	6.0	767.3	69.1
Africa	0.0	0.5	0.1	6.9	91.1
America	0.3	7.6	0.8	100.1	90.5
Asia and Oceania	3.8	87.6	5.1	660.3	65.7
Countries in Central and Eastern Europe	0.4	9.2	0.7	90.2	77.0
Developed countries	95.4	2 188.4	93.3	11 979.7	53.0
North America	73.1	1 677.3	58.2	7 469.0	45.3
Europe	10.7	246.3	19.2	2 458.6	77.7
Asia and Oceania	11.5	264.8	16.0	2 052.1	66.8

**Business-to-business e-commerce in OECD countries in 2001 [3]**

(% of enterprises)



**Internet users per 10 000 people in 2002 [1] [2]**



**Growth of number of Internet users [1] [2]**

(in %)

Regions	2000 - 2001	2001 - 2002
World	25.7	26.3
Developing countries	40.8	54.0
Developed countries	20.6	15.6
Africa	35.9	59.9
Latin America	49.6	47.5
Asia	35.9	39.7
Oceania	9.2	25.4
North America	13.5	14.2
Europe	27.9	20.3