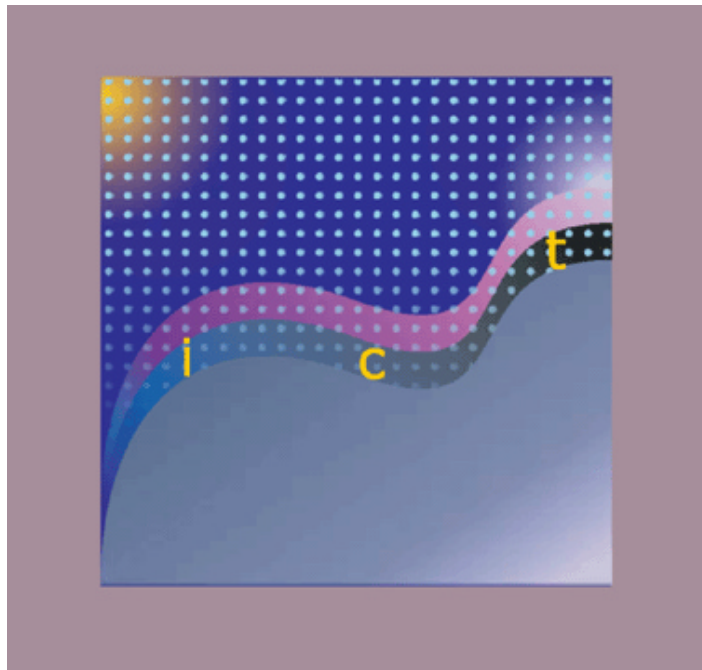


United Nations Conference on Trade and Development

# E-COMMERCE AND DEVELOPMENT REPORT 2002

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## Chapter 1

# E-COMMERCE AROUND THE WORLD: A BRIEF STATUS REPORT

Since the E-Commerce and Development Report 2001 was issued last November, the United States, the world's largest e-commerce market, has experienced a mild recession. The performance of the other major developed economies has been poorer than expected and several emerging-market economies in East Asia and Latin America have had negative growth rates. Global economic growth in 2001 fell to 1.3 per cent, as against 3.8 per cent in 2000. The rate of growth of international trade also slowed down significantly. In particular, the exports of developing countries, which had grown at a rate of 14 per cent in 2000, grew by only 1 per cent in 2001.<sup>1</sup>

When the evolution of global e-commerce in 2001 is assessed, this less than bright macroeconomic picture must be considered alongside the effects of the crisis in the dotcom industry and the fall in information technology (IT) spending in several important markets. For example, 2001 was the first year since 1985 in which worldwide personal computer (PC) shipments decreased. Against this background, the fact that the number of hosts networked in the Internet, the number of people using the latter around the world and the value of goods and services traded online keep growing at a rapid pace seems to confirm the view that the changes effected by the Internet in business, government and many other aspects of society stem from long-term considerations.

### A. Global connectivity and online trade

The measurement of people's access to the Internet and the use they make of it remains far from perfect. The problem is particularly acute when it comes to quantitative information about e-commerce in developing countries, where internationally comparable, freely accessible figures are especially scarce.<sup>2</sup> Nevertheless, even if discrepancies in terms of absolute levels exist even among the most reliable sources, a trend

towards a rapid increase in the relevant magnitudes is apparent. The Internet continues to grow rapidly

According to the International Telecommunication Union (ITU), the number of Internet users worldwide stood at 500 million people at the end of 2001. This represents 115 million more than at the end of 2000 (or about a 30 per cent increase).<sup>3</sup> The ITU forecasts that at the end of 2002 the global number of Internet users will have grown to 655 million, which would represent a yearly rate of growth of around 31 per cent.<sup>4</sup> In other words, more than 150 million people, roughly the equivalent of a country like the Russian Federation, or 2.5 per cent of the world's population, would be joining the numbers of Internet users every year. Owing to differences in definitions and methodologies, other sources provide slightly different figures; table 1 provides an overview of various estimates of Internet demographics at the end of 2001 and forecasts for 2002. A figure of 500 million current Internet users around the world would therefore seem to be a safe estimate.

**Table 1**  
**Estimates of Internet users worldwide (millions)**

Source	2001	2002
ITU	500.07	655 (forecast)
Nielsen//NetRatings	498.20	
IDC	497.70	
Nua.com 5 <sup>5</sup>	527.57	580.78 (May)

*Source: ITU (2001), ITU (2002), Nielsen//NetRatings (2002a), IDC (2002a), Nua.com (2002).*

### The number of Internet users rises in developing countries

Table 2 uses ITU figures for 2000 and 2001 to show the geographical distribution of the growth in the Internet population:

**Table 2**  
**Internet users (thousands), 2000 -2001 , by region**

Region	2001	2000	Increase	% change
<b>Africa</b>	<b>6 738</b>	<b>4 601</b>	<b>2 137</b>	<b>46.4</b>
South Africa	3 068	2 400	668	27.8
Egypt	600	450	150	33.3
Kenya	500	200	300	150.0
Morocco	400	200	200	100.0
Tunisia	400	250	150	60.0
Others	1 770	1 101	669	60.8
<b>Latin America &amp; Caribbean</b>	<b>26 320</b>	<b>19 331</b>	<b>6 989</b>	<b>36.2</b>
Brazil	8 000	5 000	3 000	60.0
México	3 636	2 712	923	34.0
Chile	3 102	2 537	565	22.3
Argentina	3 000	2 500	500	20.0
Peru	3 000	2 500	500	20.0
Venezuela	1 300	950	350	36.8
Colombia	1 154	878	276	31.4
Others	3 128	2 253	875	38.8
<b>North America</b>	<b>156 323</b>	<b>136 700</b>	<b>19 623</b>	<b>14.4</b>
United States	142 823	124 000	18 823	15.2
Canada	13 500	12 700	800	6.3
<b>Asia</b>	<b>157 779</b>	<b>108 231</b>	<b>49 547</b>	<b>45.8</b>
Japan	57 900	37 200	20 700	55.6
China	33 700	22 500	11 200	49.8
Republic of Korea	24 380	19 040	5 340	28.0
Taiwan Province of China	7 820	6 260	1 560	24.9
India	7 000	5 500	1 500	27.3
Others	26 979	17 731	9 247	52.2
<b>Europe</b>	<b>144 410</b>	<b>108 339</b>	<b>36 071</b>	<b>33.3</b>
Germany	30 000	24 000	6 000	25.0
United Kingdom	24 000	18 000	6 000	33.3
Italy	16 000	13 200	2 800	21.2
France	15 653	8 500	7 153	84.2
Spain	7 388	5 387	2 000	37.1
Netherlands	5 300	3 900	1 400	35.9
Sweden	4 600	4 048	552	13.6
Russian Federation	4 300	3 100	1 200	38.7
Poland	3 800	2 800	1 000	35.7
Others	33 369	25 403	7 966	31.4
<b>Oceania</b>	<b>8 505</b>	<b>7 635</b>	<b>870</b>	<b>11.4</b>
Australia	7 200	6 600	600	9.1
New Zealand	1 092	830	262	31.6
Others	213	205	8	3.9
<b>World</b>	<b>500 074</b>	<b>384 837</b>	<b>115 237</b>	<b>29.9</b>

Source: ITU (2002) and UNCTAD calculations. Totals may not add up because of rounding of decimals.

The data show that a growing share of new Internet users are in developing countries. Overall, developing countries accounted for almost one third of new Internet users worldwide in 2001. In the most developed markets penetration is nearing saturation levels as the numbers of those who do not plan to get Internet access in the near future seem to have stabilized.<sup>6</sup> Therefore, the growth in the share of developing countries will continue. Already Asia, excluding Japan and the Republic of Korea, added almost 21 million new users to the Internet in 2001, more than North America. Recent data from sources other than ITU would put the number of Internet users in China at 56.6 million, thus making China the second largest Internet population in the world in absolute numbers.<sup>7</sup> Another study predicts that by 2005 there will be 941.8 million Internet users in the world, or almost twice as

many as at the end of 2001, and that the largest number of users will be concentrated in Western Europe and Asia/Pacific (excluding Japan).<sup>8</sup>

In spite of the encouraging increase in the number of users, penetration rates in most developing countries remain very low. On the basis of ITU estimates, the percentage of the world's population using the Internet at the end of 2001 should have been around 8 per cent, that is 30 per cent higher than the 6.4 per cent that the ITU calculated at the end of 2000, but still far below the 50 per cent and above penetration rates in the most advanced countries. Table 3 provides information about these percentages for each region, and how they changed between 2000 and 2001. Details are provided for the countries with the largest absolute numbers of users.

**Table 3**  
**Internet users per 10,000 people, 2000-2001, by region**

Region	2001	2000	% change
<b>Africa</b>	<b>85</b>	<b>59</b>	<b>43.4</b>
South Africa	701	549	27.5
Egypt	93	71	31.1
Kenya	160	65	145
Morocco	131	70	86.3
Tunisia	412	261	58.1
Others	29	18	56.7
<b>Latin America &amp; Caribbean</b>	<b>497</b>	<b>373</b>	<b>33.5</b>
Brazil	464	294	57.7
México	349	274	27.1
Chile	2 002	1 658	20.8
Argentina	800	675	18.6
Peru	1 149.7	974	18.0
Venezuela	527.8	393	34.3
Colombia	269.6	207	30.0
Others	293	214	36.8
<b>North America</b>	<b>4 932</b>	<b>4 469</b>	<b>10.4</b>
United States	4 995	4 507	10.8
Canada	4 353	4 130	5.4
<b>Asia</b>	<b>437</b>	<b>303</b>	<b>44.3</b>
Japan	4 547	2 931	55.1
China	260	174	49.7
Republic of Korea	5 107	4 025	26.9
Taiwan Province of China	3 490	2 810	24.2
India	68	54	25.5
Others	248	166	49.3

**Table 3 (continued)**

Region	2001	2000	% change
<b>Europe</b>	<b>1 805</b>	<b>1 359</b>	<b>32.7</b>
Germany	3 642	2 918	24.8
United Kingdom	3 995	3 012	32.6
Italy	2 758	2 304	19.7
France	2 638	1 443	82.8
Spain	1 827	1 343	36.1
Netherlands	3 292	2 439	34.9
Sweden	5 163	4 558	13.3
Russian Federation	293	211	38.9
Poland	984	725	35.8
Others	1 151	882	30.6
<b>Oceania</b>	<b>2 772</b>	<b>2 511</b>	<b>10.4</b>
Australia	3 723	3 445	8.1
New Zealand	2 807	2 167	29.6
Others	280	274	1.7
<b>World</b>	<b>823</b>	<b>641</b>	<b>28.4</b>

Source: ITU (2002) and UNCTAD calculations. Totals may not add up because of rounding of decimals.

### **E-commerce is also growing in developing countries, but more slowly than the number of Internet users**

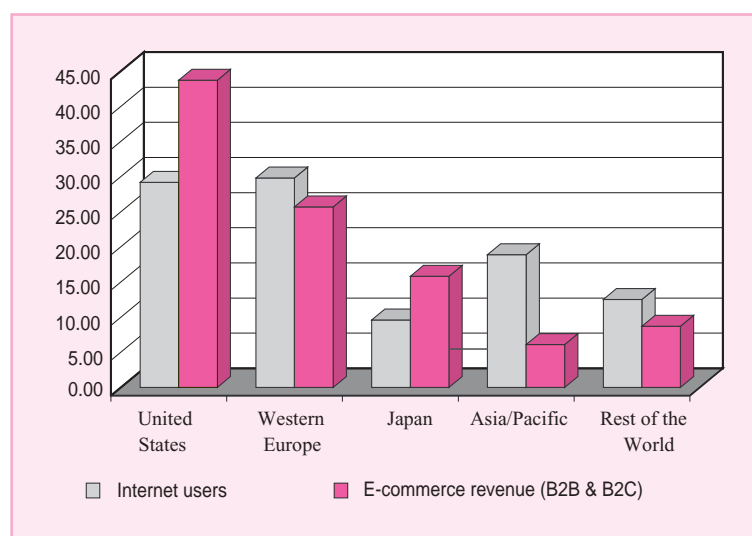
The fact that more and more people are using the Internet, which is a prerequisite for the expansion of e-commerce, is not necessarily an indication of the existence of such expansion or of its pace. Some estimates of the numbers of Internet users count anyone (including, for instance, children) who has had access to the Internet in the previous 30 days. A much higher frequency of access is necessary in order to acquire the familiarity and generate the confidence that are needed in order to become an e-commerce practitioner. Particularly in the case of those engaged in business-to-business (B2B) e-commerce, the order of magnitude of their use of the Internet cannot be of some hours per month, but of hours per day. Indeed, when asked about the use they make of the Internet, people rarely mention e-commerce as a frequent online activity. In a survey of 12 countries, e-mail was the only Internet activity in which more than 50 per cent of respondents in every country surveyed had been engaged in the previous six months.<sup>9</sup> It is safe to assume that in developing countries the proportion of Internet users who are also e-commerce practitioners is lower than average, owing of course to lower per capita incomes but also to other well-known factors such as low credit card usage, lack of relevant products or services or poor logistics and fulfilment services.

It seems that the gap between developed and developing countries in terms of access to and use of the Internet is smaller than the one in terms of e-commerce volumes.<sup>10</sup> Chart 1 illustrates this point.

Table 4 provides a summary of three different sets of forecasts and estimates of worldwide e-commerce released by Internet research firms. The last column shows the implicit compound annual growth rate of e-commerce that results from each of them, calculated using the first and last year for which data from the relevant source are included in the table. To put those figures into perspective, it may be noted that the world's total exports of merchandises and commercial services amounted to \$7.43 trillion in 2001.<sup>11</sup> In the most optimistic forecast of the three examples below, the volume of e-commerce sales would be equivalent to about 18 per cent of global sales in 2006.<sup>12</sup>

The differences between forecasts are remarkable. However, while the estimates and forecasts of the absolute levels of e-commerce for a given year can vary by a maximum factor of 2.8 times, the expected rates of growth move in a narrower band, with the highest value 17 percentage points above the lowest. Compounded even over a relatively short span of time, such differences in growth rates yield massive differences in absolute figures, but all three of them represent extremely rapid increases in global e-commerce volumes.

**Chart 1**  
**Shares of world Internet users**  
**and e-commerce revenue**



Source: IDC (2002a).

**Table 4**  
**Some estimates and forecasts of worldwide e-commerce**  
**(billions of dollars)**

	2000	2001	2002	2003	2004	2005	2006	CAGR*
Forrester			2 293.50	3 878.80	6 201.10	9 240.60	12 837.30	53.81%
IDC	354.90	615.30				4 600.00		66.93%
eMarketer**	278.19	474.32	823.48	1 408.57	2 367.47			70.80%

Sources: eMarketer (2002a), Forrester (2001), IDC (2002a) and UNCTAD calculations.

\* CAGR: compound annual growth rate; \*\* B2B only.

Forrester (2001) disaggregates its forecast at the national level. Table 5 shows an elaboration of this information in order to indicate the respective weights of developed and developing regions in global e-commerce, as well as the variations in the expected rates of growth. Although the share of developing countries in total world e-commerce is predicted to grow by about 45 per cent, in absolute terms the share will still remain at 6.7 per cent. The overwhelming share of the developing countries' participation in global online trade is forecast to be concentrated in Asia and the Pacific region, with the shares of the remaining developing

regions staying below 1 per cent. In this scenario, the annual compound rate of growth of total e-commerce in the developing countries in Asia and the Pacific is expected to be very close to that of the developed countries of Asia. The other developing regions would have very high rates of growth, although from low starting points. Thus, the value of online trade in developing countries, although modest in comparison with the global figures, would amount by 2006 to more than 180 per cent of the lowest estimates of world e-commerce in table 4 for 2002.

**Table 5**  
**A forecast of total e-commerce (B2B and B2C)**  
**(Billions of dollars)**

Region	2002	%	2006	%	CAGR (%) 2002-2006
Developing Asia and Pacific	87.6	3.8	660.3	5.1	65.7
Latin America	7.6	0.3	100.1	0.8	90.5
Transition economies	9.2	0.4	90.2	0.7	77.0
Africa	0.5	0.0	6.9	0.1	91.1
<b>Total developing countries</b>	<b>104.9</b>	<b>4.6</b>	<b>857.5</b>	<b>6.7</b>	<b>69.1</b>
North America	1 677.3	73.1	7 469.0	58.2	45.3
Developed Europe	246.3	10.7	2 458.6	19.2	77.7
Developed Asia and Pacific	264.8	11.5	2 052.1	16.0	66.8
<b>Total developed countries</b>	<b>2 188.4</b>	<b>95.4</b>	<b>11 979.7</b>	<b>93.3</b>	<b>53.0</b>
<b>World total</b>	<b>2 293.5</b>		<b>12 837.3</b>		<b>53.8</b>

Source: UNCTAD elaboration of data from Forrester (2001).

Totals may not add up because of rounded decimals.

### **B2B predominates over B2C but remains small in developing countries**

It is well known that e-commerce takes place essentially between enterprises, so that B2B amounts to around 95 per cent of all e-commerce in most estimates. As usual in e-commerce quantification, sources disagree in their forecasts of absolute B2B volumes,

but they coincide in pointing to intense growth in the next few years. Table 6 summarizes several such forecasts. The annual rates of growth they imply range between 81.5 per cent and 54.4 per cent. In the slowest-growth prediction, (Forrester, 2001), growth by region would be fastest in Asia and the Pacific (109 per cent increase between 2000 and 2005), followed by Western Europe (91 per cent) and North America (68 per cent).

**Table 6**  
**Some global B2B estimates and forecasts**  
**(Billions of dollars)**

	2000	2001	2002	2003	2004	2005	2006
Forrester	-	-	2 160	3 675	5 904	8 823	12 275
IDC	282	516	917	1 573	2 655	4 329	-
eMarketer	278	474	823	1 409	2 367	-	-
Gartner Group	433	919	1 929	3 632	5 950	8 530	

Sources: Forrester (2001); all others as cited in eMarketer (2002a).

Table 7, which presents Forrester's B2B scenario, shows that while the shares of developing countries in both B2B and B2C global e-commerce are expected to remain small in the medium term, the former could remain significantly much weaker, with the proportion between B2B and B2C being 2.5 times smaller in the developing regions than in North America. This

would be consistent with the experience of early adopter countries, where B2C was the engine that moved commerce onto the Internet in the very first phases, to be replaced later by B2B, which, using Electronic Data Interchange (EDI), was the only e-commerce modality in pre-Internet times.



**Table 7**  
**Forecast B2B and B2C in 2006, by region<sup>13</sup>**  
**(Billions of dollars)**

	B2B	%	B2C2	%	B2B/B2C
North America	7 127	58.1	211	37.5	34
Asia/Pacific	2 460	20	185	33	13
Western Europe	2 320	18.9	138	24.6	17
Latin America	216	1.8	16	2.9	13
Eastern Europe	84	0.7	6	1.1	13
Africa and Middle East	69	0.6	5	0.9	13
Total	12 275	100	562	100	22

*Source: Forrester (2001).*

*Decimals have been rounded.*

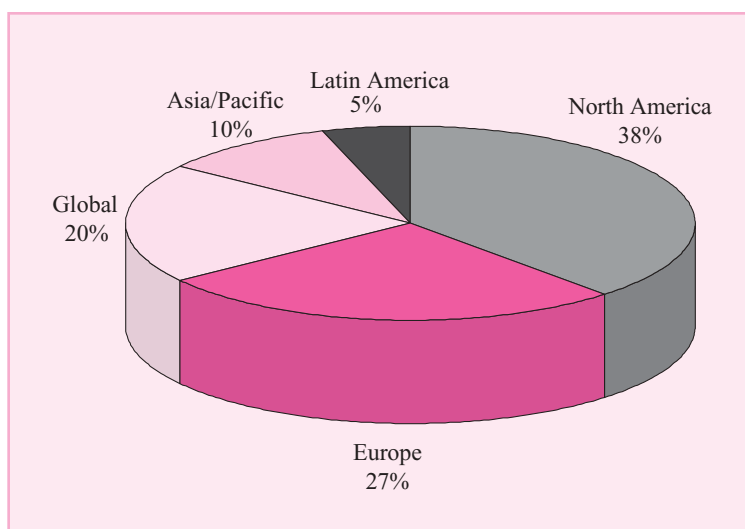
For as long as B2B does not take off in developing countries, e-commerce volumes there will remain negligible. The adoption of B2B e-commerce by the enterprises of developing countries will be intimately linked with their capacity to integrate themselves into regional and global supply chains. At the enterprise level, this requires being able to meet technological and organizational challenges. At the country level, the digital and the physical sides of their economies will have to be much better connected, because – except in the services sector – B2B e-commerce has almost as much to do with traditional, physical infrastructure (ports, railways, roads), logistics services and trade facilitation measures that are essential for supply chains to work as it does with ICT infrastructure. Foreign direct investment flows and the linkages between local producers and transnational corporations will be other important determinants of the growth of B2B e-commerce in developing countries.

Facilitating the take-off of B2B in developing countries is important because of the opportunity for growth that it represents. After all, if e-commerce matters for development it is not because it is a fancier or more convenient way to go shopping: e-commerce matters because it allows enterprises to generate efficiency gains at all the stages of their production and distribution processes. It is these gains, made essentially through the adoption of B2B and e-business practices, that count for development, because they translate into improved competitiveness for enterprises and higher levels of productivity, and hence incomes for the economy as a whole.

B2B electronic marketplaces or exchanges in their various forms (private, independent or consortia-backed) used to be seen as one of the major factors of change in this area. Their evolution in the last few months seems to confirm the view expressed in UNCTAD (2001) – that although their potential benefits can be considerable, many enterprises, especially in developing countries, may find them elusive for some time. This point is illustrated by chart 2, which presents information from a worldwide survey of e-markets that was conducted in 2001, and confirms the limited presence of developing regions in the e-market sector.<sup>14</sup>

Adapting business processes and technology to this new environment takes time and money. For instance, the necessary steps such as standardizing procedures and data definitions among the various players involved can be a time-consuming exercise in fragmented industries. However, as e-market operators refine their business models, for instance by addressing issues of confidentiality and price transparency, and also as leading enterprises attract their smaller partners into e-markets, it is to be expected that these systems will continue to absorb a growing share of global B2B sales. If the logic of simply buying and selling in a pure exchange environment evolves towards a more comprehensive concept of full collaboration among enterprises along the entire supply chain, the gains that many enterprises in developed countries (by some estimates, up to 80 per cent of those that have moved their purchase function online) seem to be achieving from online procurement of indirect goods can be spread more generally and reach higher levels.

**Chart 2**  
**Primary regions served by surveyed public exchanges, 2001**



Source: Booz Allen Hamilton and Giga Information Group as cited in eMarketer (2001c).

Even though online procurement and, on a larger scale, supply chain management can cut costs dramatically if accompanied by the necessary organizational changes, they are far from being the only ways in which B2B e-commerce can enhance the competitiveness of an enterprise. Thus, a B2B trend that is gaining momentum in the more advanced markets is the deployment of demand-chain IT solutions. In 2001, when the economic environment encouraged enterprises to examine their IT outlays more closely, sell-side e-commerce solutions seemed to be among their top spending priorities in the area.<sup>15</sup> The purpose of these efforts is to enhance the efficiency of the interaction between a company with existing customers and/or the various players along its distribution channel and to enable it to reach a larger number of potential customers. Web-enabled demand-side applications help companies achieve these objectives through a wide range of possibilities, such as new, more valuable services for customers based on online availability of information, economically viable product customization, better understanding and predictability of customer needs and behaviour, or making it possible to work online with smaller customers at a reasonable cost.

## B. Regional perspectives

### Connectivity is slowly improving in Africa, but e-commerce remains limited

With local Internet connection now available in all African capital cities the possibilities (in terms of connectivity) to engage in e-commerce have markedly improved, at least for the minority of Africans who live in the continent's major urban centres. In 18 countries calls to access the Internet are now charged at local rates. Legal monopolies in Internet service provision have almost disappeared, although de facto Internet service provider (ISP) monopolists still operate in several of the smaller markets. The number of dial-up subscribers grew by 30 per cent in 2001 and now stands at about 1.3 million. Incoming Internet traffic represents 1 gigabyte per second, while the outgoing is around 800 megabytes per second.<sup>16</sup> According to Intelsat, its data traffic from Africa grew by 30 per cent in 2001 and is expected to overtake voice traffic by 2005.<sup>17</sup>

In spite of all these positive developments, the gap in the availability of the basic infrastructure for e-commerce between developed and developing countries is largest in Africa. Table 2 showed that while in the most advanced countries half of the population uses the Internet,<sup>18</sup> only 1 in 118 people can do the same in Africa and only 1 in 440 when the five countries with the most users are excluded from the calculation. Although mobile telephony has expanded extremely rapidly across the continent, it does not yet offer an alternative, for the purpose of connecting to the Internet, to the scarce fixed lines. Cost considerations also remain a very considerable obstacle to access to the Internet. The average cost of using a local dial-up account in Africa for 20 hours a month is about \$68 per month, including local call time but not line rental charges.<sup>19</sup> Since the World Bank estimates that the gross income per capita for sub-Saharan Africa in 2000 was \$470, it is clear that for the vast majority of Africa's population it is utterly impossible to pay such access costs.

For the few who can use the Internet, the experience in terms of speed and stability is often very different, and much more inadequate for e-commerce purposes, than that of users in other regions. Given the cost and low speed of connections e-mail is even more important for African users than in the rest of the world; many turn to web-based free providers based in developed countries for this service, even if this means longer connection times. The reason for this seems to be concerns about privacy and the long-term survival prospects of local providers.

Very few updated statistics or even estimates of e-commerce volumes in Africa are available, except for South Africa. Some forecasts put total e-commerce in Africa at \$0.5 billion in 2002, concentrated almost exclusively in South Africa, and predict that it will grow to \$6.9 billion by 2006, with South Africa generating \$6.1 billion and Egypt almost all the rest. In this scenario, Africa's share in global e-commerce by 2006 would represent 0.05 per cent of global online trade.<sup>20</sup> Given the comparatively low level of integration of African enterprises into international trade and the continent's pattern of exports, it is not surprising that B2B outside South Africa remains almost negligible. However, B2B opportunities have been identified in the online and offline services sector.<sup>21</sup>

In spite of the extremely low volumes involved, anecdotal evidence of African e-commerce success stories in the B2C sector is amply available.<sup>22</sup> As is to be expected in view of the low levels of income and con-

nectivity on the continent, exports represent the vast majority of online trade in Africa. Among these, handicrafts and products and services targeting Africans outside their home countries seem to dominate.<sup>23</sup> As for the most mature e-commerce market on the continent – South Africa – retail online sales remain at low levels. According to data released in May 2002, B2C sales in South Africa in 2001 amounted to only \$16 million, which represented 0.1 per cent of total retail sales in that country.<sup>24</sup>

### **Latin America makes progress but faces sharp divides<sup>25</sup>**

E-commerce in the Latin American region is highly concentrated in four relatively developed Internet markets (Argentina, Brazil, Chile and Mexico), which together account for more than two thirds of the number of Internet users in the region<sup>26</sup> and, according to some estimates, 85 per cent of all paid dial-up Internet accounts.<sup>27</sup> While Internet access providers in these markets are starting to introduce satellite services and broadband access, the problems faced by the majority of the other countries in the region remain very basic and relate to problems such as low fixed-line penetration.

In the four countries mentioned above (and in other smaller markets, especially in the Caribbean area), enterprises, or at least those in the formal sector, are reasonably e-commerce aware, and the situation is improving rapidly in other countries in the region (Colombia and Peru). Overall, between 50 and 70 per cent of Latin American enterprises are estimated to have access to the Internet, and by the end of 2001 virtually all companies with 200 or more employees were expected to have a website.<sup>28</sup> However, for most enterprises being aware of e-commerce does not immediately lead to their actually engaging in it. E-mail is widely used for business contacts and market information is gathered through web services, but only a minority of enterprises carries out online transactions. The use of e-business applications for customer relationship management, supply chain management or enterprise resource management is not widespread.

In January 2001 it was estimated that B2B transactions in Latin America had reached \$2.85 billion in 2000.<sup>29</sup> Given the relatively large volume of intra-industry trade in the region, B2B e-commerce is expected to continue to expand rapidly. The same study forecast \$67 billion in B2B e-commerce revenue in the region in 2004; as indicated in table 5 above, Forrester (2001) predicts that by 2006 the figure will have grown to

\$215.7 billion (1.8 per cent of global B2B e-commerce), up from \$18.1 billion in 2002.

Large transnational corporations, notably in the automotive sector, are playing a key role in the development of online B2B transactions, especially in Brazil and Mexico. In Brazil, the largest e-commerce market in the region by far,<sup>30</sup> the adoption of both B2B and B2C practices has been spearheaded not by dotcom start-ups but by traditional players seeking to diversify their distribution channels and to improve the efficiency of their supply chain operation. For instance, in 2000 Volkswagen's Brazilian subsidiary reported \$5 billion in purchases made through its online procurement system, which links it with over 500 suppliers directly involved in production activities and some 3,000 in all.<sup>31</sup> Locally owned Brazilian players, especially banks and retail chains, are also keen adopters and promoters of B2B e-commerce. Finance and government-related e-commerce applications such as tax collection, information gathering and procurement<sup>32</sup> are among the other major e-commerce sectors in Brazil.

With regard to B2C, the region has experienced robust growth in recent years. eMarketer (2001a) estimated B2C e-commerce in Latin America at \$724 million in 2000. According to Boston Consulting Group, retail sales in Latin America reached \$1.28 billion in 2001, more than doubling the \$540 million estimated for 2000.<sup>33</sup> Of the total retail e-commerce in the region, 54 per cent (\$906 million) would be accounted for by Brazil; Mexico's online retail sales would amount to \$134 million, Argentina's to \$119 million and Chile's to \$45 million. Strong growth was expected for almost all these markets in 2001 and 2002, the exception being Argentina, where retail e-commerce is expected to have very little, if any growth at all, in 2002.<sup>34</sup>

Some aspects of B2C e-commerce in Latin America differ from the patterns observed in more consolidated markets. For instance, online car sales, which have not taken off elsewhere, represent the largest e-retail item in Latin America at an estimated \$504 million in 2001 with the Brazilian subsidiary of the French car-maker Renault expecting to sell 15,000 cars (20 per cent of its total sales) online in 2002. Consumer auctions (\$203 million), travel (\$140 million) and computer hardware and software (\$139) are the other individual items each amounting to over \$100 million per year.<sup>35</sup> As a curiosity, online groceries sales, at \$79 million, are the only sector in which the share of online sales in total sales in Latin America (especially in Argentina and Brazil) is similar to that of the United

States. Another sector in which B2C providers in the region, particularly in Brazil, have developed a competitive edge is banking. For instance, Brazil's largest private bank, Bradesco, was among the first five banks in the world to offer Internet services. Another Brazilian bank, Unibanco, was the first to introduce the first virtual credit card in the world in cooperation with Mastercard.<sup>36</sup>

There are no surprises as to the major obstacles to the expansion of retail e-commerce in the region, which are the same as in other developing regions: low Internet penetration rates, inadequate payment systems, poor fulfilment systems and low-quality customer service. On the other hand, significant progress has been made in the region in terms of awareness creation as evidenced by the large proportion of formal-sector enterprises with Internet access and the development of a legal framework for e-commerce as illustrated by the fact that all major economies in the region have undertaken legal changes to accommodate e-commerce.

As in other developing regions of the world, an issue whose implications for the future of e-commerce are not yet clear is the effect of widespread access to mobile telephony. In several Latin American markets mobile telephony users already outnumber fixed-line subscribers. Some analysts believe that Internet access through handheld devices could reach the same levels as PC-based access by 2005 and thus make up for the region's low fixed-line penetration.<sup>37</sup> Whether this would be feasible and would have an impact on e-commerce volumes without changes in the technological basis and the business models remains unclear.

### **Asia and the Pacific lead in the adoption of e-commerce among developing countries**

Demographic weight alone could be enough to explain the leading position of the Asia/Pacific region in the spread of e-commerce in developing countries: at current rates, the region is adding close to 50 million new Internet users a year. This is more in absolute terms, and relatively faster than any other region of the world. But other factors come into play besides sheer demographics. Enterprises, particularly in the manufacturing sector, are more integrated into intra regional and global trade flows than those of other developing regions. This means that they are more exposed to pressures from their customers in developed countries to adopt e-business methods and are investing to be able to do so. New broadband technologies are being deployed faster in some middle- and high-income

countries in the region than anywhere else. For example, the world's top three markets as regards the number of digital subscriber lines (DSL) per 100 people are the Republic of Korea (10.95), Hong Kong, China (5.56) and Taiwan Province of China (4.83). In all, 46 per cent of all DSL in the world at the end of 2001 were in the Asia-Pacific region.<sup>38</sup> Finally, governments across the region, both at the national level and in the context of regional forums such as the Association of South-East Asian Nations (ASEAN) and the Asia-Pacific Economic Cooperation (APEC), have taken a proactive role in the promotion of e-commerce, adapting the legal and regulatory framework, embracing e-government and implementing e-awareness and education plans.<sup>39</sup>

Given its massive size and potential, the evolution of e-commerce in **China** will be determinant for the region's and, in the medium term, for global e-commerce volumes.<sup>40</sup> A report by the China Internet Network Information Center (CNNIC) released in January 2002 confirms the recent rapid growth of the Chinese Internet population (almost at the rate of 50 per cent in 2001), the concentration of users in the major urban centres and in the coastal provinces (while the Internet penetration rate is 10.4 per cent in the Guangdong region, it is as low as 0.2 per cent in Qinghai province), and an improvement in the number of women and people with lower education levels who access the Internet.<sup>41</sup> China's Internet population, already the world's third largest,<sup>42</sup> is well placed to become the largest online population in the region in the near future, even if infrastructure problems and per capita income levels will keep penetration rates low. The transformation of this large potential into an actual e-commerce market may not happen at the same pace. According to CNNIC (2002), more than two thirds of Chinese Internet users have yet to make their first online purchase. Of those who have done so, only about one third said they were "quite satisfied" or "satisfied" with the experience.

Logistical difficulties such as insufficient transport networks represent a serious obstacle to B2B development, as they make it difficult for companies to realize the potential gains of increased efficiency in their supply chains. Another commonly cited obstacle to B2B in mainland China is the emphasis that the traditional business culture places on strong personal relationships. However, this does not seem to have prevented other Chinese-culture markets from adopting e-business practices. Whatever the case may be, forecasts of B2B volumes diverge significantly. While some sources put it at as much as \$6 billion for 2002 and

point to strong growth bringing the figure to nearly \$22 billion by 2004,<sup>43</sup> other estimates paint a much less optimistic picture – for them, from a low base of \$600 million, B2B e-commerce in China would amount to only \$9.6 billion in 2006.<sup>44</sup>

**Japan**, which for the time being still ranks as the country with the largest Internet population in Asia, experienced strong growth in e-commerce sales in 2001 despite the poor overall performance of the economy. According to data from the Electronic Commerce Promotion Council of Japan, online sales grew by 58.4 per cent in 2001 and reached a total value of \$264.5 billion, of which 96 per cent was in the B2B sector.<sup>45</sup> Other estimates put the total e-commerce volume in Japan at a more modest level, predicting that it will amount to only \$186 billion in 2002.<sup>46</sup> Recent growth in e-commerce in Japan seems to have been strongest in sectors such as chemical and industrial machinery and paper and office goods, although information technology goods and the automotive industry remain predominant. In the B2C sector growth was strongest in clothing, leisure and travel services, and real estate. Overall, however, e-commerce volumes remain comparatively low considering the high levels of disposable income, the exception being Japan's lead in the adoption by consumers of some mobile Internet services. Broadband access is also growing at a rate of about 300,000 new subscribers per month (1.5 million subscribers were reported as of January 2002), which should bring the total number to 5 million at the end of 2002. The rapid growth of DSL service may have been stimulated by the Government's "e-Japan strategy", which aims at providing high-speed access for at least 30 million households and ultra high-speed for another 4 million in the next five years.

Although absolute volumes remain modest, e-commerce growth in 2001 and in the first quarter of 2002 in the **Republic of Korea** was dramatic. The most recent data available for 2002 from the National Statistical Office show year-on-year increases in e-commerce sales of 83.4 per cent (April), 89.2 (March), 84.9 (February) and 89.8 (January). This would represent total online sales of \$1.04 billion in the first quarter of 2002.<sup>47</sup> These figures do not capture most of B2B trade in the country. In contrast, other forecasts go as high as \$29 billion for total e-commerce in 2002, rising to about ten times that amount by 2006.<sup>48</sup> Contributing to this will be the fact that the Republic of Korea has the world's highest penetration of broadband technologies (as of May 2002 there were over 8.5 million DSL subscribers or 18 per cent of the population).<sup>49</sup> A number of factors seem to be playing an important

role in the rapid deployment of this technology,<sup>50</sup> including proactive government policies supporting the laying of a dense optic fibre network in the major urban centres, the high density of the Republic of Korea's residential patterns which facilitated the establishment of "last mile connections", and intense competition between operators, resulting in affordable subscription costs.

**India**, whose Internet population is expected to be second only to China's by 2006, remains a small e-commerce market, which is estimated at half the volume of China's, or about a total of \$300 million for 2002.<sup>51</sup> As in most other countries, e-mail is the favourite application of India's seven million Internet users,<sup>52</sup> who are worried about the security of online payments and do very little online shopping. As in other developing countries, PC and telephone penetration rates are very low and competition among ISPs is limited. B2B volumes are concentrated in the automotive sector and in banking and financial services. However, India has developed a successful industry in IT and in the IT-enabled services sector, whose potential annual e-commerce sales have been estimated at \$10 billion.<sup>53</sup> Chapter 5 examines the prospects and challenges of this industry in developing countries and its potential contribution to the development of e-commerce.

A summary of the situation and potential evolution of e-commerce in a number of **other Asian developing countries**, based on Forrester (2001), is provided in table 8. According to this estimate, these countries would generate 2.5 per cent of global online trade in 2002 and 3.2 per cent in 2006.

**Table 8**  
**Total e-commerce (B2B and B2C)**  
**in selected Asian countries**  
**and territories**  
**(2002-2006, billions of dollars)**

Country/Territory	2002	2006	CAGR (%)
Hong Kong, China	15.6	98.8	58.6
Indonesia	0.1	1.6	100
Malaysia	1.7	18.4	81.4
Philippines	0.1	1.4	93.4
Singapore	10.5	66.4	58.6
Taiwan Province of China	29	223.8	66.7
Thailand	0.2	2.9	95.1
<b>Combined total</b>	<b>57.2</b>	<b>413.3</b>	<b>63.9</b>

Sources: Forrester (2001) and UNCTAD calculations.

Decimals have been rounded. CAGR: compound annual growth rate.

### Rapid growth but very modest volumes in countries with economies in transition

Rapid growth in both B2B and B2C is expected in the Central and Eastern European countries with economies in transition. However, even with annual rates of growth of 90 per cent, given the very low baseline from which they are starting it is unlikely that e-commerce in transition economies will reach 1 per cent of global e-commerce before 2005. Table 9 shows two estimates of the evolution of e-commerce in transition economies.

**Table 9**  
**Estimates of the evolution of**  
**e-commerce in transition economies**  
**(Billions of dollars)**

Source	2001	2002	2003	2004	2005	2006	CAGR
IDC*	1.25	-	-	-	-	23	79%
Forrester**	-	9.2	17.9	33.7	56.6	90.2	76.9%

Sources: IDC, as cited in eMarketer (2002e); Forrester (2001).

\* IDC data refer to the Czech Republic, Hungary and Poland (B2B only).

\*\* Forrester data refer to the Czech Republic, Hungary, Poland, the Russian Federation, Slovakia and Ukraine.

The landscape of Internet penetration and of e-commerce adoption in the region offers strong contrasts. While the more advanced reformers, such as the Czech Republic, Estonia, Slovenia and to some extent Hungary or Poland have relatively high rates of digital literacy and are putting in place the foundations for the development of e-commerce activity, others (particularly in the Balkans, the Caucasus and Central Asia) remain far behind. In the short term the differences between these two groups of transition economies are likely to deepen as the more advanced countries accede to the European Union. Their accession should result in improved competition in the telecommunications sector and an enhanced regulatory framework for e-commerce. Even in the best-positioned countries there are differences in access between urban and rural areas.

Together with low per capita incomes, relatively expensive telecommunications, lack of trust due to delays in the development of an adequate legal framework and underdeveloped payments and credit systems are commonly cited obstacles to the development of e-commerce in these countries.

Nevertheless, countries in the region can count on a number of favourable factors that may contribute to

the enhancement of their capacity to benefit from information and communications technologies (ICT) applications and particularly e-commerce. For instance, in the Russian Federation, a number of B2B trading platforms have been developed as a response to the preponderance of exportable commodities in its economy and the importance of Internet-generated efficiency gains in small-margin markets such as commodities.

The high levels of general education prevalent in many countries in the region, and in particular the relative abundance of workers with advanced IT skills, could be another source of competitive advantage for the region. The proliferation of Linux server software in some of the Baltic countries is an example of how companies are benefiting from opportunities to access low-cost, high-performance technologies that can be absorbed only in the presence of an adequate level of IT skills in the workforce.

### **Growth continues in North American and Western European markets**

In both Western Europe and North America, e-commerce growth seems to have suffered little as a result of the prevailing poor economic conditions.

In the United States, according to the Department of Commerce, B2C e-commerce grew by 19.3 per cent in the first quarter of 2002 compared with the same quarter of 2001. In the same period total retail sales (online and offline) increased by 2.7 per cent. As a result, online sales represented 1.3 per cent of total retail sales, almost twice the 0.7 per cent they represented when the Department of Commerce first produced e-commerce estimates in 1999.<sup>54</sup>

Given that the figures compiled by the Department of Commerce exclude some important items in B2C commerce, such as airline tickets, it may be useful to complement its data with other sources. For instance, in a sample of 11 estimates by private research firms the median estimate of the total value of B2C e-commerce in the United States in 2001 was \$53.1 billion.<sup>55</sup> Estimates for 2002 are around \$70 billion, which would mean an increase of over 30 per cent compared with 2001.<sup>56</sup>

In Europe, B2C volumes remain considerably smaller, and are estimated at around \$ 20 billion in 2001.<sup>57</sup> Various forecasts predict that by 2005 the value of European B2C will be between 5 and 10 times that amount.<sup>58</sup> A positive influence in the development of European B2C was the arrival of the "physical" euro

at the beginning of 2002, which may be making it easier for consumers to benefit from enhanced price transparency in cross-border B2C sales in the euro area. On the other hand, the European market in several B2C sectors remains fragmented because of cultural and/or linguistic barriers and differing consumer preferences.

It has been argued that the growth in B2C during an economic slowdown can be attributed to consumers looking for bargains. It seems more likely that the figures show that rather than being a maturing activity, online retailing is still in a phase of intense growth even in those economies where it took off earlier. Even though the growth in the number of Internet users is slowing down, users are becoming more inclined to engage in e-commerce. In the United States, at the end of 2001, 58 per cent of Internet users had made purchases online, compared with 51 per cent a year before. The amounts spent by online consumers are also growing: the average online expenditure per person in the end-of-year season is estimated to have grown by 18.8 per cent between 2000 and 2001, from an average of \$330 to \$392.<sup>59</sup> Other B2C estimates, covering online orders for the first quarter of 2002, are lower (\$127 per average online order) but also show growth (5.3 per cent) compared with the equivalent figure from 2001.<sup>60</sup> Growth in Western Europe is slower and only 17 per cent of consumers are buying online, although another 18 per cent use the Internet to gather information before making a purchase.<sup>61</sup>

Another positive sign for B2C e-commerce in the United States, particularly after the loss of credibility experienced by many dotcom projects, was the fact that 56 per cent of online retailers managed to make a profit in 2001, while only 43 per cent had done so in 2000. Reducing expenses, particularly in marketing, was crucial to the improvement of profitability. Customer acquisition costs were reported to have fallen from \$29 in 2000 to \$14 in 2001.<sup>62</sup> The good results of "clicks-and-bricks" retailers seem to confirm the better competitive position of business models that combine the efficiency gains of online operations with the logistical and direct contact advantages of an offline presence.

Although even in the United States the weight of B2C in total retail sales remains modest (below 3 per cent in the most optimistic assessments), it has progressed significantly more in a number of sectors, in some of which online sales already amount up to 18 per cent of total sales. Some of these sectors, such as software,

travel and tourism services, and music, could represent good opportunities for developing country suppliers.

It is in the area of B2B that, in spite of the great difference in the amounts traded online in Europe and in the United States, with B2B volumes being about seven times larger in the United States than in all the developed countries of Europe combined, the implementation of e-business strategies in European companies will more closely follow, both in time and in modalities, the patterns established by their North American counterparts.

Forrester (2001) forecasts that 26 per cent of sales in the United States, mostly B2B, will be traded online by 2006, and European online sales are predicted to amount to 19.3 per cent of total sales. Other studies predict that European B2B will represent 21 per cent of all European commerce between companies as early as 2004.<sup>63</sup> Such growth would involve a massive transfer of transactions to an online environment, considering that online B2B in 2001 was, at most, 2 per cent of all B2B transactions in the United States and much less in Europe. The gap between online B2B purchasing penetration rates in the United States and those in Europe are predicted to decrease by 30 per cent, although this will still mean that online B2B purchasing will be only 5 per cent of all European B2B, while in the United States it will amount to 33 per cent.<sup>64</sup>

In terms of industries, financial services, electric and electronic equipment industries, other business activities<sup>65</sup> and transport, retail, metal and machinery, chemicals and petroleum, postal and telecom, vehicles and pulp and paper industries are among those in which the percentage of online B2B purchasing is expected to become higher by 2004.<sup>66</sup>

Both in the United States and in Western Europe the potential savings generated through e-business tools for procurement, supply chain operations, business process outsourcing and, to a certain extent, e-marketplaces will attract attention and investment in B2B. In e-procurement, the focus will probably move from indirect goods, where the limits to potential benefits may be reached earlier, to the acquisition of inputs directly used in the productive process. Successful e-procurement implementation is reported to result in savings in lead times of up to 30 per cent and reductions in transaction processing costs of up to 25 per cent.<sup>67</sup> As mentioned before, the demand-chain aspects of B2B operations, such as customer relationship management tools, are becoming more important

items in the IT budgets of large companies in developed countries.

In 2001, European companies spent a much larger share of their IT budgets on e-business solutions than did their United States counterparts, thus starting to close the transatlantic gap in the implementation of e-business.<sup>68</sup> Not only was European e-business expenditure larger, but also (according to the companies themselves) it was the result of different motivations. While for North American managers the main objectives of their e-business projects in 2001 were to ensure customer loyalty, to improve productivity and to reduce costs, for European companies it seems that acquiring new customers was by far the first priority in their e-business projects.<sup>69</sup>

### C. E-commerce and development: the international dialogue

The previous sections attempted to show that the process of Internet-generated global economic changes did not slow down with the global economy in 2001. Although technology is the engine that drives this process, it is people's decisions and attitudes that set its direction. Whether the outcome will be an increase or a reduction in the capacity of developing countries to close the gaps that separate them from the industrialized world will therefore depend to a not inconsiderable extent on factors that policy makers, business players and other stakeholders can influence. These include, for instance, the e-business environment or the promotion of a proactive attitude towards organizational change. In practical terms, policies must be designed, articulated in coherent e-strategies and implemented in partnership with all the relevant e-players to ensure that the new possibilities to create, transform, apply and exchange information and value are used to improve the productivity of developing economies and their enterprises.

A participatory approach, at both the national and international levels, to the development and implementation of e-commerce strategies seems essential for their success. If such multi-stakeholder approaches are the key to the long-term success of development strategies in general, their importance is even greater in an area such as e-commerce. Creating awareness at the political level or adopting a state-of-the-art regulatory framework will be sterile unless the prospective e-commerce practitioners perceive these strategic elements and the objectives they serve as relevant and



appropriate to their needs, interests and capacities. The concept of the Internet as a separate, self-regulated community free from government intervention has not survived its confrontation with the realities of commercialization. Yet there is some truth left in the vision of the Internet as a frontier where government action, while necessary and desired, will be more likely to succeed if it relies on the support of the pioneers who first cleared the land, such as the volunteers that developed open-source code or the non-governmental organizations that brought telephones to areas that telecommunications monopolists had left unattended. This can only be achieved if e-commerce strategies are developed through a consultative process that allows the involvement of all the relevant players in the private sector and the civil society.

The process of designing the strategies that can make e-commerce a force working for development must necessarily include an international component. Each national Government has the responsibility of defining, in a dialogue with the other domestic stakeholders, the areas where they feel change must be undertaken, and the pace at which they wish to implement it in order to respond to the challenges of competition in the digital economy. The international community can support these efforts by ensuring that the developmental perspective is present in a meaningful way in the multiple international discussions about the Internet, ICTs and the organization of their economic applications. It should also assist interested developing countries in the formulation and implementation of their national e-commerce strategies for development by mobilizing resources and contributing to the sharing of experiences.

The role of e-strategies in broader national development strategies has attracted growing interest in several international forums where the issue of the global digital divide is being addressed, such as the G-8's DOT Force and the ICT Task Force launched by the Secretary-General of the United Nations in November 2001.<sup>70</sup> Thus, the Plan of Action adopted by the G-8 in Genoa in 2001 included as its first action point "to help establish and support developing country and emerging economy national e-strategies".<sup>71</sup> Ensuring that the benefits of ICT are available to all is also one of the key goals that the international community set itself in the Millennium Declaration.<sup>72</sup> As part of the action undertaken by the United Nations towards the achievement of these goals, its ICT Task Force has identified the provision of assistance to developing countries in designing national and regional ICT strategies as one of its medium-term goals and has set up a working group to that end.

A close relationship between national e-commerce strategies and international cooperation would be greatly facilitated by the emergence of a common understanding of the fundamental elements of e-commerce strategies for development, especially if, as seems desirable, ICT is to be mainstreamed into official development aid programmes. That is a major objective of the intergovernmental policy dialogue that is currently taking place in UNCTAD in the field of e-commerce both in Geneva and through a series of high-level regional workshops in the field. Contributing to greater awareness and better understanding of the issues at stake for developing countries is also the objective of the E-Commerce and Development Report 2002.

## Notes

1 UNCTAD (2002).

2 See, for example, a discussion of the issue of Internet access and activity measurement in Minges (2000). The problems of the measurement of e-commerce in developing countries were discussed in UNCTAD (2001).

3 International Telecommunication Union (2002).

4 International Telecommunication Union (2001).

5 In May 2002 the breakdown by region was as follows: Africa, 6.31 million; Asia/Pacific, 167.86 million; Europe, 185.83 million; Middle East, 5.12 million; Canada and United States, 182.67 million; Latin America, 32.99 million. See Nua.com (2002).

6 At least as far as PC-based access to the Internet is concerned. Other forms of Internet access still show large growth potential in developed countries.

7 Nielsen//NetRatings (2002b).

- 8 IDC (2002a).
- 9 Nielsen//NetRatings (2002c).
- 10 IDC (2002a).
- 11 WTO (2002).
- 12 Forrester (2001).
- 13 The classification of countries in regions used by the source does not coincide with the one normally used by the United Nations. Forrester (2001) adds data for Mexico in its North American aggregates. For the purpose of this chapter, Mexican figures are included in Latin America.
- 14 Booz Allen Hamilton and Giga Information Group (2001).
- 15 eMarketer (2001c).
- 16 The information about Internet connectivity, costs and usage patterns in Africa is taken from Jensen (2002).
- 17 ITWeb.co.za (2001).
- 18 Other estimates put this figure at over 60 per cent.
- 19 Jensen (2002).
- 20 Forrester (2001).
- 21 Descriptions of the situation and prospects for e-commerce in Africa can be found in UN Economic Commission for Africa (2001) and UNCTAD (2000).
- 22 See, for example, the African cases in the survey of e-commerce in the LDCs contained in chapter 9 of UNCTAD (2001).
- 23 Part of e-commerce B2C targeting expatriate Africans may not be increasing the export capacity of local producers, as some of the goods and/or services sold to them may be replacing direct monetary transfers to their relatives and are consumed locally by them.
- 24 World Wide Worx (2002).
- 25 See Hilbert (2001) for an overview of the main e-commerce issues in Latin America.
- 26 ITU (2002a).
- 27 Yankee Group (2001).
- 28 Hilbert (2001).
- 29 eMarketer (2001a).
- 30 Estimates of the relative weight of Brazil in Latin American e-commerce vary. It is safe to assume that it represents at least 50 per cent of e-commerce in the region.
- 31 Bastos (2001).
- 32 In January 2002 the federal government of Brazil announced savings of \$208 million thanks to its use of e-government services. Its portal, Rede Governo, gives access to some 1,500 services.
- 33 Boston Consulting Group (2001a).
- 34 According to a report by the Argentinean consulting firm Price & Cooke, quoted in wired.com in March 2002, the growth in Internet users in Argentina would fall to one-digit figures in 2002. See wired.com (2002).
- 35 Boston Consulting Group (2001a).
- 36 United States Commercial Service (2001).
- 37 wired.com (2001).
- 38 eMarketer (2002c).
- 39 See, for example, the e-ASEAN Task Force website at <http://www.e-aseantf.org/> for information about national and regional initiatives in the areas of e-commerce, legislation, awareness creation and human resources development.

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- 40 For a more detailed discussion of e-commerce in China see UNCTAD (2001).
  - 41 CNNIC (2002).
  - 42 Or the second largest, by some estimates.
  - 43 eMarketer. (2001b).
  - 44 Forrester (2001).
  - 45 Electronic Commerce Promotion Council of Japan (2002).
  - 46 Forrester (2001).
  - 47 National Statistical Office of the Republic of Korea (2002).
  - 48 Forrester (2001).
  - 49 *Korea Times* (2002).
  - 50 eMarketer (2002c).
  - 51 Forrester (2001).
  - 52 India's National Association of Software and Service Companies (NASSCOM) calculates that the number of active subscribers as of March 2002 was only 1.5 million.
  - 53 According to a 2002 joint study of NASSCOM and McKinsey; see NASSCOM (2002).
  - 54 United States Department of Commerce (2002). Figures are not seasonally adjusted.
  - 55 The estimates had been made at different times between late 2000 and March 2002 by Jupiter Media Metrix, Datamonitor, Cyber Dialogue, eMarketer, Forrester, ComScore, Yankee Group, GartnerG2, Giga Information Group, Boston consulting Group and IDC. See eMarketer (2002d)
  - 56 eMarketer (2002d) and Forrester 2001.
  - 57 See IDC (2002 b) or European Information Technology Observatory (2002).
  - 58 See a table setting out forecasts by several research companies at [www.emarketer.com/ereports/europe\\_ecom/welcome.html](http://www.emarketer.com/ereports/europe_ecom/welcome.html).
  - 59 Information Technology Association of America (2002).
  - 60 *E-commerce News* (2002).
  - 61 Cap Gemini Ernst & Young (2002).
  - 62 Boston Consulting Group (2002).
  - 63 Boston Consulting Group (2001b).
  - 64 Boston Consulting Group (2001b).
  - 65 These include business services, real estate leasing and sales, machinery leasing, private health services and recreational services.
  - 66 Boston Consulting Group (2001b).
  - 67 Boston Consulting Group (2001b).
  - 68 According to a study by the consulting firm Accenture, the gap between Europe and the United States in the adoption of e-commerce technology amounted to 12 months as of mid-2001. See eMarketer (2002b).
  - 69 Computer Sciences Corporation (2001).
  - 70 See [www.unicctaskforce.org](http://www.unicctaskforce.org).
  - 71 See [www.dotforce.org/reports](http://www.dotforce.org/reports).
  - 72 See General Assembly resolution A/RES/55/2 of 18 September 2000, available at [www.un.org/millennium/declaration/are552e.pdf](http://www.un.org/millennium/declaration/are552e.pdf).
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