United Nations Conference on Trade and Development

E-COMMERCE AND DEVELOPMENT REPORT 2004

FOREWORD AND OVERVIEW

UNITED NATIONS
New York and Geneva, 2004

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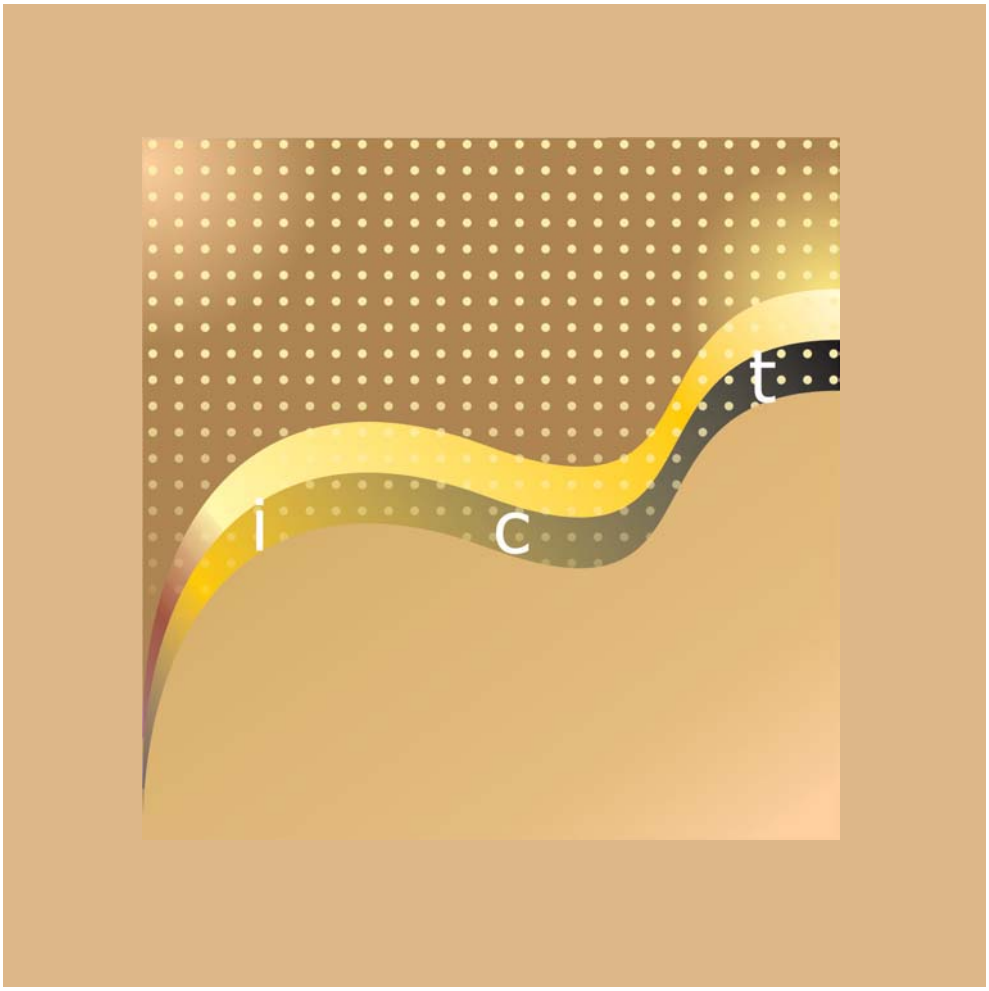
Prepared by the UNCTAD secretariat



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The English version of the full report and the English, French and Spanish versions of its Overview section are currently available on the Internet at the address indicated below. Versions in other languages will be posted as they become available.

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http://www.unctad.org/ecommerce/

UNCTAD/SDTE/ECB/2004/1

UNITED NATIONS PUBLICATION

Sales No. E.04.II.D.42

ISBN 92-1-112653-3

Foreword

Information and communications technologies have considerable potential to promote development and economic growth. They can foster innovation and improve productivity. They can reduce transaction costs and make available, in mere seconds, the rich store of global knowledge. In the hands of developing countries, and especially small- and medium-sized enterprises, the use of ICTs can bring impressive gains in employment, gender equality and standards of living.

In recent years, international trade in ICT-related goods and services has grown faster than total trade. Some developing countries are making good use of ICT-generated opportunities to broaden their customer bases and increase their participation in international supply chains. But if all countries are to benefit, and if ICTs are to make a real impact on a country's economic prospects, more needs to be done to build capacities and create an enabling environment, nationally and internationally.

That effort will have to address broad, global issues such as Internet governance and the protection of intellectual property, as well as narrower, specific tasks such as ensuring that SMEs have access to ICTs. It is also likely to involve profound transformations on the part of individual workers and companies, and across economies as well. To accomplish such change with a minimum of disruption, policies need to be conceived and applied through a participatory approach. Such policies should also be firmly rooted in our overall struggle to defeat poverty and achieve other social goals.

This fourth E-commerce and Development Report discusses the effects of ICTs on the economies of developing countries and their enterprises, the costs and benefits of investing in ICTs and how societies can achieve higher rates of return on those investments. Its data and analysis are meant to provide a solid underpinning for the global debate on how best to implement the Plan of Action agreed to at the first phase of the World Summit on the Information Society (Geneva, December 2003). As we continue our efforts to spread the benefits of ICTs more widely and equitably, I am pleased to commend this report to a wide global audience.

Kofi A. Annan
Secretary-General of the United Nations

Acknowledgments

The *E-Commerce and Development Report 2004* was prepared under the overall direction of John Burley, Director of UNCTAD's Division for Services Infrastructure for Development and Trade Efficiency (SITE). It was drafted by a team coordinated by Angel González Sanz and consisting of the following UNCTAD staff members: Dimo Calovski, Hannah Davies, Scarlett Fondeur Gil, Carlos Moreno, Marta Pérez Cusó, Susan Teltscher and Chiara Vitucci.

Pilar Borque Fernández and Marie Kamara provided administrative support.

Diego Oyarzun designed the cover and formatted the charts, the text was edited by Graham Grayston.

The UNCTAD team acknowledges the contribution of the following consultants, experts and researchers who provided inputs for various chapters: Alan Levin, Alf Neumann, Lucinda Ramos and Ian Walden.

The assistance and contributions provided by the following private and public sector entities are also gratefully acknowledged: the Ministry for Technologies, Communications and Transport of Tunisia, Fundación para el Desarrollo Sostenible en América Latina (FUNDES), the Arab Institute of Business Leadership (Tunisia) and Bedoui & Company Consulting (Tunisia).

The team also wishes to thank the following individuals for the information, comments and feedback they provided regarding various aspects of the Report: Luís Abugattas, Cécile Barayre, Mongi Hamdi, Rouben Indjikian, Keri Facer and Professor Angela McFarlane.

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List of abbreviations

A

ADR	alternative dispute resolution
ADSL	asymmetric digital subscriber line
APEC	Asia-Pacific Economic Cooperation
ASEAN	Association of South-East Asian Nations
ASP	applications service provider
ATI	Agence Tunisienne d'Internet

B

BDS	business development support
BOT	build-operate-transfer
BPO	business process outsourcing
BSD	Berkeley Software Distribution
B2B	business-to-business
B2C	business-to-consumer
B2G	business-to-government

C

CAD	computer-aided design
CAM	computer-aided manufacturing
CARICOM	Caribbean Community and Common Market
CC	Creative Commons
CCK	Centre de Calcul El-Khawarizmi
ccTLD	country code top level domain
CD	compact disc
CD-ROM	compact disc read-only memory
CERT	Centre des Etudes et Recherche en Télécommunication
CFC	Common Fund for Commodities
CIMSP	Centre informatique du Ministère de la Santé Publique
CNC	computer numerical control
CNI	Centre National de l'Informatique
CNS SSII	Chambre Nationale Syndicale des Sociétés de Services et d'Ingénierie Informatique
CNSS	Caisse Nationale de la Sécurité Sociale
CRM	customer relationship management

D

DAI	digital access index
DNS	Domain Name System
DRM	digital rights management
DSL	digital subscriber line
DSS	decision support systems
DVD	Digital Versatile/Video Disc

E

ECLAC	Economic Commission for Latin America and the Caribbean
ECOWAS	Economic Community of West African States
EDI	electronic data interchange
EIU	Economist Intelligence Unit
ERP	enterprise resource planning
ESCAP	Economic and Social Commission for Asia and the Pacific

EU	European Union
Eurostat	Statistical Office of the European Communities

F

FAMEX	Fonds d'accès aux marchés d'exportation
FAQ	frequently asked questions
FDI	foreign direct investment
FIPA	Foreign Investment Promotion Agency
FITI	Fonds d'Incitation à l'Innovation dans les Technologies de l'Information
FM	frequency modulation
FOPRODEX	Fonds de Promotion et Développement d'Exportation
FOPRODI	Fonds de Promotion et Développement d'Industrie
FOSS	free and open source software
FOSSFA	Free and Open Source Software Foundation for Africa
FSF	Free Software Foundation
FTP	file transfer protocol
FUNDES	Fundación para el Desarrollo Sostenible en América Latina

G

GATS	General Agreement on Trade in Services
GDP	gross domestic product
GIS	geographical information systems
GITR	Global Information Technology Report
GNI	gross national income
GNP	gross national product
GNU	GNU is not UNIX
GPL	General Public License
GPS	global positioning system
GUI	graphical user interface

H

HRD	human resources development
HTTP	hypertext transfer protocol

I

ICANN	Internet Corporation for Assigned Names and Numbers
ICC	International Chamber of Commerce
ICO	International Coffee Organization
ICTs	information and communication technologies
IDE	integrated development environment
IFPI	International Federation of the Phonographic Industry
IML	information markup language
INBMI	Institut National de Bureautique et de Micro-informatique
IP	Internet protocol
IPRs	intellectual property rights
IRESA	Institut de la Recherche et de l'Enseignement Supérieur Agricole
IRSIT	Institut Régional des Sciences Informatiques et des Télécommunications
ISDN	integrated services digital network
ISET'Com	Institut Supérieur des Études et de Recherches des Télécommunications
ISP	Internet service provider
IT	information technology
ITC	International Trade Centre UNCTAD/WTO
ITES	information-technology-enabled services
ITU	International Telecommunication Union

J

JIT	just-in-time (production)
J2EE	Java 2 Platform Enterprise Edition

K

Kbps	kilobits per second

L

LAN	local area network
LMS	Learning Management System

M

M&A	mergers and acquisitions
Mbps	megabits per second
MC	music cassette
MDG	Millennium Development Goals
MIDI	Musical Instrument Digital Interface
MIT	Massachusetts Institute of Technology
MNEs	multinational enterprises
mp3	Moving Picture Expert Group - 1/2 Audio Layer 3
MUST	Malaysia University of Science and Technology

N

NGO	non-governmental organization
NRI	networked readiness index

O

OCW	Open Course Ware
ODR	online dispute resolution
OECD	Organisation for Economic Co-operation and Development
OKI	Open Knowledge Initiative
OSD	Open Source Definition
OSFS	open-source and free software
OSI	Open Source Initiative

P

PC	personal computer
PDA	personal digital assistant
p2p	peer-to-peer

R

R&D	research and development
RIAA	Recording Industry Association of America
RITI	Régime d'Incitation à l'Innovation dans les Technologies de l'Information
RNRT	Réseau National de Recherche et de Technologie
RNS	Réseau National de Santé

S

SBTC	skill-biased technological change
SCAA	Specialty Coffee Association of America

SCM	supply chain management
SCORM	Shareable Courseware Object Reference Model
SIC	standard international classification
SME	small and medium-sized enterprise
SSL	secure sockets layer (protocol)
Sup'Com	Ecole Supérieure des Communications

T

3G	third-generation (wireless technology)
TAI	technology achievement index
TCO	total cost of ownership
TLD	Top Level Domain
TNC	transnational corporation

U

UDRP	Uniform Dispute Resolution Policy (of ICANN)
UNCITRAL	United Nations Commission on International Trade Law
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNITAR	Universiti Tun Adbul Razak
USO	universal service obligation

V

VCR	video cassette recorder
VoIP	voice-over Internet protocol
VSAT	Very Small Aperture Terminal

W

Wi-Fi	wireless fidelity
WIPO	World Intellectual Property Organization
WMA	Windows Media Audio
WSIS	World Summit on the Information Society
WTO	World Trade Organization

X

XML	extensible markup language

Explanatory Notes

The term dollars ($) refers to United States dollars unless otherwise stated. The term billion means 1,000 million.

Two dots (..) indicate that the data are not available or are not separately reported.

A hyphen (-) indicates that the amount is nil or negligible.

Because of rounding, details and percentages do not necessarily add up to totals.

Overview

1. INFORMATION AND COMMUNICATION TECHNOLOGIES FOR ECONOMIC DEVELOPMENT: ISSUES FOR INTERNATIONAL DIALOGUE

A. The reach of the Internet and the growth of e-commerce

At the end of 2003, nearly 676 million people (or 11.8 per cent of the total population of the world) had access to the Internet. This represents an increase of 49.5 million people or 7.8 per cent compared with the figures at the end of 2002. Developing countries account for more than 36 per cent of all the Internet users in the world and their share in the Internet population of the world grew by nearly 50 per cent between 2000 and 2003. However, Internet users in the developing world are concentrated in a handful of countries: China, the Republic of Korea, India, Brazil and Mexico account for 61.52 per cent of them. Almost 75 per cent of the growth in the number of Internet users in the world occurred in the developing world. In spite of rapid rates of improvement in the penetration ratios of developing countries, these remain ten times lower than the average of the developed world.

The number of Internet hosts worldwide grew by 35.8 per cent between January 2003 and January 2004, reaching a total of over 233 million, which represents a doubling of the growth rate in 2002. In terms of number of websites, as of June 2004 there were over 51,635,284 websites worldwide, 26.13 per cent more than a year before. The number of websites using the secure sockets layer protocol (SSL), which supports secure transactions, grew by 56.7 per cent between April 2003 and April 2004, reaching 300,000.

A comprehensive approach to the measurement of the diffusion, uptake and effects of ICTs across the world has been undertaken by Orbicom, the Network of UNESCO Chairs in Communications. Orbicom's model is based on a conceptual framework that incorporates not only considerations concerning connectivity and e-readiness, but also ICT-relevant skills and the use that people and companies make of them. This is reflected in a country's *Infostate*, which aggregates *Infodensity* (available stocks of ICT capital and labour, including networks and ICT skills) and *Info-use* (uptake and consumption flows of ICTs as well as their intensity of use). The application of this approach has confirmed the huge gap that separates the most ICT-advanced countries, which have attained a *Infostate* valued at 200, from the lowest-ranking group of mostly African and Asian countries, with *Infostates* as low as 5. While the international digital divide seems to be closing, this is happening only at a slow rate and for the most part in middle-ranking to countries, while those in the most difficult situation are not seeing much progress. While income levels and higher *Infostates* show a positive correlation, notable exceptions exist: countries with similar levels of gross domestic product (GDP) show very different *Infostates,* and vice versa. ICT policy choices seem therefore to make a noticeable difference.

E-commerce growth

The available data from the United States and the European Union (EU) show that while the value of online transactions is increasing, it is not increasing at the same speed as that at which businesses connect to the Internet.

In the United States, e-commerce between enterprises (B2B), which in 2002 represented almost 93 per cent of all e-commerce, accounted for 16.28 per cent of all commercial transactions between enterprises. While overall transactions between enterprises (e-commerce and non e-commerce) fell in 2002, e-commerce B2B grew at a annual rate of 6.1 per cent. As for business-to-consumer e-commerce, sales in the first quarter of 2004 amounted to 1.9 per cent of total retail sales, a proportion that is nearly twice as large as that recorded in 2001. The annual rate of growth of retail e-com-

merce in the United States in the year to the end of the first quarter of 2004 was 28.1 per cent, while the growth of total retail in the same period was only 8.8 per cent.

Internet sales in the EU totalled $86 billion in 2001. Electronic data interchange and other non-Internet sales represented were four times greater than Internet sales, bringing the total e-commerce sales in the EU to about $430 billion in 2001.

Although some developing countries have started to collect ICT indicators through their official statistical systems, the data are not always comparable across countries or with those of developed countries. This calls for collective action at the international level to coordinate the methodological work and to work towards a global database of ICT indicators. The UNCTAD secretariat has launched a new data collection exercise to compile e-business statistics from developing countries and make them available in its annual *E-Commerce and Development Report*. The results can be found in chapter 1.

B. The dialogue about ICT-for-development: Some suggestions

The question of Internet governance

The discussions throughout the World Summit on the Information Society (WSIS) process made it clear that a majority of developing countries feel that the status quo in this matter does not serve their interests well and needs to be changed. The establishment of some sort of intergovernmental mechanism has been proposed. Concerns have been expressed, for instance, about the dominance by a small group of countries over core Internet resources. Legal mechanisms based on the enforcement of private contracts (to be carried out essentially by the national courts of one country) are not necessarily the optimal way to settle international public policy issues. Some view the Internet as a new kind international public utility in which they feel they are not playing the role that is legitimately theirs.

Once the need to respond to questions such as those outlined above is understood, it is also necessary to admit that there are not many examples of concrete policy areas in which such responses require the development of new Internet-specific international institutions, especially from the viewpoint of economic competitiveness. In fact, given the political will to tackle the issues, existing systems of international coordination, cooperation or rule-making could be sufficient to deal with many if not most of the governance problems posed by the development of the Internet.

A crude device to categorize the public policy issues that need to be addressed and the responses that could be explored in each case could be to distinguish between the management of the Internet as a global utility and the international governance issues posed by the use which people make of that utility.

Concerning the group of issues that could fall into the second category, international governance instruments already exist or could easily be devised. The substantive character of the issue in question, rather than the fact that the Internet is the medium through which the problematic activity is conducted, should be the determining criterion as to what level of "governance" (from consensus-building and cooperation to rule-making) and what instruments should be applied.

Concerning the other group of issues, such as the management of the Domain Name System and the operation of the root server system, many developing countries are not at ease with the limited influence of Governments in the structures in which policies are developed and implemented. Reaching a common definition of the interests of the international community that must be served by the system of Internet governance, and agreement about the way in which Governments should be involved in it, probably constitutes the most important aspect of the work to be done. Although at this stage of the discussion it is too early to make concrete institutional proposals, some of the features that they should have can be distinguished.

First, for any reform proposal to be viable it must provide strong evidence that it will ensure the continued stability and quality of service of the Internet, prevent its fragmentation and maintain the "bottom-up" processes through which standards and policies have been developed so far.

Second, no one-size-fits-all solution is likely to emerge. Questions in which technological and

policy issues are particularly intertwined are likely to be best treated within a network of international frameworks of cooperation and coordination.

Third, evolution is more likely to produce results than a voluntaristic top-down approach. The current system is the result of a process that has taken place over a remarkably short time and has has not yet reached a stage of maturity that is acceptable to all its stakeholders.

Developing countries need to assess the implications of different Internet governance models, including in terms of their impact on the capacity of their economies to benefit from the adoption of e-commerce and e-business practices. A sustained capacity-building effort for Internet policy-making is also needed so that the majority of the developing countries can effectively participate in the management/governance systems that may emerge from the WSIS process.

ICT and economic development in the run-up to the next phase of the WSIS

The WSIS Plan of Action emphasizes the role of national e-strategies as key instruments for the advancement of the information society in developing countries. It also calls for action to promote development-oriented ICT applications for all, in particular the use of ICT by small and medium-sized enterprises (SMEs) to foster innovation, achieve gains in productivity, reduce transaction costs and combat poverty. The treatment of these issues in the WSIS context should contribute to the emergence of a consensus about the national policies under which, and the international environment in which, a higher degree of ICT take-up and usage can result in faster, more equitable economic growth.

The available data show that international trade in ICT goods and services has grown in recent years at a faster rate than total international trade and that it remains robust. However, in order to extend the reach of the positive effects of ICTs on the economic growth of the majority of developing countries an enabling environment for ICTs needs to be created at the national and international levels. Promotion and facilitation of the adoption of ICTs by enterprises, and particularly by SMEs, should also play a major role in this regard.

In order to go further in its treatment of the economic aspects of the information society, the second phase of the WSIS could explore answers to such questions as the following:

- What effects, positive or negative, are ICTs having on the economic prospects of developing countries? What lessons from available experience can be applied to ICT policy-making in the areas that affect trade, enterprise development or employment?
- What strategies have proved successful in terms of enabling enterprises, especially SMEs, to become more competitive through the use of ICTs?
- How can ICTs be used to facilitate the participation of developing countries' SMEs in national and international supply chains?
- What effects will ICT-induced changes, at the level of the firm and of the whole economy, have on labour markets? What policies may facilitate equitable outcomes for these processes?

2. E-BUSINESS AND SMALL AND MEDIUM-SIZED ENTERPRISES

The adoption of ICTs by enterprises has grown considerably over the past few years, with more and more firms connecting to the Internet. Firms use ICTs for internal automation, for example of office and production processes, for customer relations and supply chain management, or for the management of distribution and logistics networks. Internet use may range from simple web-site presence to the complete integration of business functions. The latter, however, is a major step for SMEs in developing countries and requires management and technical skills, as well as organizational changes and investments that can often not be afforded. The Report investigates the uptake of ICTs by SMEs in developing countries on the basis of available surveys and studies. It

thus provides an overview of ICT usage and e-business in SMEs and makes suggestions for policies that could enhance the adoption of ICTs by businesses.

The Report first provides an overview of how ICTs change traditional business processes, such as marketing, sales and purchases, production and inventory control or finance and human resource management. Looking at statistical evidence from developed countries, it shows that ICT usage usually increases with the size of companies, although SMEs have been found to have the greatest potential for productivity gains through e-business. But in order to achieve these benefits, firms also need to have good managerial capacities, technical skills and innovation, which may be harder for SMEs in developing countries to afford.

An assessment of ICT usage by SMEs in developing Asia and Africa shows that, generally speaking, many firms have connected to the Internet and actively use it for communicating with suppliers and customers. This is particularly true for companies in urban areas, whereas the urban–rural digital divide excludes many SMEs located outside the major cities. Nevertheless, in many cases Internet use is limited to the owner or managers of the enterprise, and little has been done to take full advantage of the opportunities offered by the new technologies. Studies show that profitability is key to SMEs' willingness to go online. Despite the fact that several studies have demonstrated the correlation between ICT adoption and firm profitability/productivity, one of the major reasons for not using ICTs (from the viewpoint of the company owner) is the perceived limited impact on business profitability, often coupled with the argument that few suppliers and customers are online. On the other hand, if companies experience a positive impact on their business, for example an increase in the number of customers, they are willing to invest in hardware and connectivity. In other words, the readiness of SMEs to invest in ICTs is not necessarily a cost factor.

A survey of SMEs in five Latin American countries (Chile, Colombia, Costa Rica, Mexico and Venezuela) – carried out jointly by UNCTAD and FUNDES – reveals details about the use of ICTs and the Internet at the firm level. The results show that the availability of personal computers (PCs), the Internet and ICTs is high among companies located in urban areas, and there are no significant differences between small and medium-sized companies as regards basic access to and use of the Internet (such as e-mail). However, the more complex tasks, in particular automating and integrating business processes, are carried out much less frequently by SMEs. E-commerce is still rare and small companies use more e-marketplaces, whereas medium-sized companies use company websites (of third parties or their own) for selling online. Service companies are the most active users of ICTs and the Internet, followed by trade and manufacturing (the least active). This corresponds to findings in other developing regions and is partly explained by the fact that functions such as marketing and selling services online require basic Internet access and website presence, and less system integration related to, for example, supply and value chain management, as is the case in manufacturing.

The main perceived barrier to Internet uptake is very similar across companies from both developed and developing countries. Firms already using the Internet consider the lack of network security to be the key problem, followed by slow and unstable connections. Another important finding is that for many companies the main reason not to go online is not the lack of technical skills, but the fact that doing so often depends on management capacities and the overall ICT awareness of the company owner.

The Report concludes that getting access to the Internet is not a major problem for most firms – even if connections are mostly slow. Much more difficult is to fully integrate the companies' business functions using ICTs, and even more so for SMEs in developing countries. The surveys also confirm that there is a certain evolution over time that all companies will go through when adopting ICTs. For SMEs, it is relatively easy to start using PCs, then connect to the Internet using e-mail, and thereafter set up a web page. However, introducing the Internet into their business activities (internal or external, including e-commerce) does not follow straight away and larger companies are more likely to automate their business processes (and to do so earlier) than smaller companies.

One explanation is that most SMEs have no defined e-business strategy. Putting in place more complex e-business systems, intranets or extranets, and linking up with suppliers' and customers' computer systems, both require not only technical know-how but also a solid analysis of the costs and benefits implied by the necessary investments,

and convincing arguments in favour of them. On the other hand, SMEs have the advantage of implementing strategic and organizational changes much more quickly (and at lower cost) than large companies. This flexibility should provide them with a competitive edge when it comes to the adoption of e-business.

The Report points to a few areas for policy-making. First, SMEs need access to reliable, low-cost connections, where dial-up services are often sufficient. Therefore, and to bridge the urban–rural divide, the emphasis should be on providing universal good-quality basic access. Naturally, this should be followed by high-speed connections to allow companies to move towards full integration of e-business. Second, trust in a legal and regulatory environment supportive of the Internet economy is essential if companies are to engage in e-business. Third, if SMEs are to make the leap from simple (and low-cost) Internet use, such as e-mail and web search, to building e-business systems fully integrated with those of their customers and suppliers, additional investments are required, as well as the necessary technical and managerial skills to plan and successfully implement an e-business strategy. These are clearly areas where public and private agencies can play a crucial role in support of SMEs.

Finally, the review of the e-business surveys showed how difficult it is to make cross-country comparisons, even on such simple indicators as Internet and e-mail use or web site presence in companies, given the available data and statistics. In order to have a comparable and representative picture of ICT readiness and use, the continuous collection of data through official statistical sources is required.

3. CREATIVE INDUSTRIES AND DIGITAL AND INTERNET TECHNOLOGIES: THE CASE OF MUSIC

Music-making is a talent-based and laborious activity. Developed countries used to have advantages in technology, but the general progress in computing and the Internet is rapidly eliminating any difference. Developing countries need to look to using technologies to promote and popularize their musical capacities and seek earnings from performance. The global entertainment sector has recently been more concerned about restricting illicit use of copyrighted content, and thus may provide only marginally relevant guidance for artists and industry in developing countries.

Digital and Internet technologies and music are a near-perfect match. Music has escaped from its guardians – the recording and publishing companies – and is being freely exchanged and experienced on the Internet's peer-to-peer (p2p) networks. The music industry has recognized that the advance of broadband Internet and p2p technologies is foundational, and is reacting to contain possible damage until developments play out with greater clarity. Positions and arguments have become polarized. The music industry claims that, physical piracy aside, file sharing is hurting sales and, it follows, songwriters' and musicians' earnings – as well as their own corporate profits. Academia, consumer rights groups, and liberal advocacy groups have frequently claimed the contrary, but often accept that file sharing of copyrighted content is plainly illegal.

Nonetheless, the entertainment industry has successfully argued for an increase in the strength of copyright legislation and enforcement with Governments and international organizations. In the meantime, it is seeking to develop a for-pay alternative to illegal p2p downloading. With one minor exception, none of these portals are p2p and therefore may not be universally accepted by consumers. Their popularity will be inversely related to the strength and diversity of the copy-protection technologies used and the variety of proprietary file standards. The creative and business power of the Internet will be greatly advanced when artists, industry and audiences discover how to commercialize p2p file sharing. Solutions were found in the past for other problematic technologies: FM radio, cassette tapes and videotape recorders. However, as current developments show, the large music companies are unlikely to set the pace, particularly since they are still recovering from the Internet bubble. This leaves the field wide open for technology companies that may not experience unmanageable levels of anxiety from the threat of technological change.

The opportunities offered by technology require a change in the business model of artists and industry alike. Changing business models is in itself a risky business. But the music industry is no stranger to risk taking. Indeed, only 5 to 10 per cent of its releases achieve profitability, albeit enormous. From the artists' perspective, digital and Internet technologies offer the opportunity of greater independence and artistic control. First, the Internet provides access to information on the commercial mechanics of the mainstream music business, allowing artists to assess what revenue mix (recording, song writing, performing, etc.) and accordingly, what investments, will maximize their income for a given degree of artistic and commercial freedom. Secondly, the capacities of modern digital recording and production technologies are ground-breaking: the ability of the Internet to introduce artists to an audience, distribute their music and provide a conduit for a more personal relationship has no historical parallel. From an audience perspective, even though modern law allows audiences only to "use" published or recorded music, most listeners experience a cognitive and emotional appropriation of a given composition: thus sharing music online may, mistakenly, not seem to be a breach of licence or property. In any case, it is rarely a breach of musicians' properties: the record companies or publishers typically acquire the copyrights from artists in return for expected royalties. While reimbursing publishing royalties is not an uncommon event, recording royalties are a less steady revenue stream.

Developed-country music markets are in their mature phase, and future growth will depend on convincing audiences to part with leisure time dedicated to other activities such as Internet browsing, watching films on DVD or playing computer games – a difficult proposition at best. Therefore, large developing-country music markets that have growth potential will continue to attract the interest of the "majors" provided that they can establish or improve and maintain workable copyright environments. The international music industry will continue to lobby for eliminating any perceived trade restrictions on the import of cultural goods and services. At the same time, developing nations need to re-examine GATS support for "mode four" delivery of services through the movement of natural persons in order to improve conditions for travel their artists by when the latter are pursuing performance income.

Developing countries with large national and diaspora markets, such as Brazil, India and China, will improve their grasp of technology and will undoubtedly succeed in increasing international sales of CDs as well as venture into online for-pay downloading. The artistic and cultural communities need to fully appreciate the commercial details of the industry at an international level in order to optimize their revenue mix (recording, composing, performing). The essential question will be one of scaling costs to activities and choosing the appropriate technologies. Ambitions need to be given a realistic dimension, if being understood that the bulk of major releases do not achieve profitability. Given the statistical improbability of major earnings from recording, artists may be motivated to develop online activities more fully, assisting audiences' discovery of their talent and thus generating improved revenues in concert performance or by composing for other musicians. Because both traditional copyrights and liberal open-source licences require legislation and protection, developing countries need to have in place a legal framework and collecting agencies. This will also enable the development of strong national markets and interaction and business with the international entertainment industry. However, artists should not shy away from exploring open licensing under the impression that it means giving away work and music for free. The spectrum of choice is large, while the type of contracts offered by the "majors" to the select few and the give-away of the public domain are but two extreme variants.

4. ONLINE HIGHER EDUCATION: ISSUES FOR DEVELOPING COUNTRIES

Online higher education, which involves the dissemination of, access to, and exploitation of higher education, including research, via the Internet, is being explored and promoted as a strategy to provide further access to education and technology for national and international students. It is also being used to promote ICT skills, provide additional revenues (or extra funding resources) and enhance the competitiveness of institutions and individuals, at both the national and the international level.

For example, in India students are able to obtain via the Internet a bachelor's degree in information technology (IT) from the Indira Gandhi Open University (IGNOU). IGNOU is building on its existing structure as a distance education provider. With a $200,000 budget it is providing online education to 10,000 students, with some content developed in-house and other bought from a provider in the United Kingdom.

The Report studies the impact and potential benefits of online higher education in developing countries by analysing the effect that the Internet is having on higher education and the international market in educational services. It provides an overview of current initiatives and indicates some of the key issues for assessing whether online higher education is a sound proposition for students, institutions, enterprises and Governments in developing countries, and if so, in what circumstances.

The current online higher education market is still small (compared with traditional face-to-face education) and fragmented (with multiple providers and self-developers providing flexibility, innovation and plurality but also some confusion). It is more established in developed countries, where a strong education system, a competitive market and ICT infrastructure are in place. These countries are also the major exporters of higher education services. In developing countries, the Internet is being progressively introduced into higher education catering mainly for those able to afford it. Online programs are concentrated in the most popular and marketable subject areas (business management, ICTs, and education) and the large majority are in English.

There are programmes like that of IGNOU around the globe – on small islands in the Pacific, in Africa, in South America and elsewhere. Online higher education initiatives emerge in different shapes and forms, from complete new virtual universities to traditional institutions incorporating the Internet to complement their services. The Report identifies five models of online higher education in developed and developing countries, which clearly arise from particular economic, educational and political contexts as well as from the particular needs and capacities that institutions have to provide innovative and progressive mechanisms for using the Internet. The strategies for adopting online higher education available to educational institutions in developing countries include customizing programmes to the local context, building on existing market presence or developing regional leadership, and/or options that exploit the experience of other institutions, such as partnerships in the provision of content and technology or in the recognition of diplomas.

Investment in online higher education whether by students, institutions or national Governments needs to be measured against other priorities and needs. The Report shows how the economic rationale to invest in online higher education is based not only on possible economies of scale, but also on the urgent need to find new funding sources, the potential efficiencies generated by specialization and "modularization" as well as new business models, and the pressure to compete with other providers.

The Internet amplifies current educational trends, including the increasing use of private–public partnerships and the involvement of private companies in education and the internationalization of higher education. It also allows the unbundling of education services, thus increasing the specialization of the different providers (who include teachers, IT providers, media and content creators, and institutional managers). More importantly, the Internet is calling into question current business models and is providing further options for accessing and using content and software, networking internationally and customizing and reusing

higher education services. In particular, it is questioning current models of academic research and publishing and current legal frameworks and practices in terms of quality assurance, accreditation and recognition measures as well as in terms of intellectual property rights.

Governments have an important responsibility to overcome financial, technological and development hurdles and promote the development of an educated population. They play a key role in maximizing the potential of online higher education initiatives, and particularly in ensuring that such initiatives narrow rather than increase digital divides and support local needs and culture. Suggestions in this connection include the following: creating awareness and encouraging collaboration and dialogue among different stakeholders; fostering a culture of learning; promoting coherence between educational and ICT strategies; supporting the use of open technology and open content in higher education; providing incentives for investing in e-learning and online higher education so that educational goals are maximized; developing transparent quality assurance, accreditation and recognition measures; and monitoring and measuring economic, educational and social benefits and costs.

In conclusion, whether or not online higher education is a sound option for developing countries depends rather than on potential financial opportunities and on the overall capacity to meet specific educational and developmental goals. Governments' actions can contribute to making online higher education a sound proposition by creating an educational and policy environment that enables the expansion of higher education to previously excluded students, encourages relevant and appropriate learning content and processes, promotes innovation and investment in education, and recognizes students' needs and efforts.

5. E-GOVERNMENT: E-PROCUREMENT AND DEVELOPING E-BUSINESS CAPACITY

ICTs, and particularly the Internet, create the possibility of reorganizing and networking government services to make them more efficient, transparent and user-friendly. One important way in which these potential benefits can be realized is through e-procurement, by which government organizations use the Internet to procure/purchase goods and services from the private sector, advertise their needs, select vendors, manage service and fulfilment of contracts, and effect payments.

There are incomplete statistical data on the e-procurement market worldwide, although it can be generally stated that government is usually the largest purchaser in an economy and that the value of the market is of significant importance to national economies. For example, estimates of the ratio of total procurement for all levels of government in OECD countries were at almost 20 per cent of 1998 national GDP ($4.7 trillion), and at approximately 14 per cent ($816 billion) for non-OECD countries.

Although there are tangible benefits to e-procurement in the reduction of prices and process costs, the achievable return on investment of e-procurement projects remains hard to assess. Early corporate adopters of e-procurement claimed savings of between 8 and 15 per cent and returns on investment in under a year. However, once strategic sourcing starts to mature and is factored in, cost savings are reduced. Users of e-procurement systems could maximize short-term benefits by limiting initial deployment, and focusing on smaller categories first (e.g. office supplies) and on helping suppliers by, for example, offering payment upon receipt of advice of shipment.

Other benefits of e-procurement are in the areas of governance and administration. With respect to governance, e-procurement facilitates the implementation of transparent public decision-making and is a deterrent to lack of compliance and corruption. In terms of administrative processes, it may reduce bureaucracy (including overheads, or money spent on administration of services rather than their delivery) and save expense and time. E-procurement will also impact on the level of ICT skills among all system users.

Efficient online transactions with government agencies can also act as incentives for businesses of all sizes to adopt ICTs and e-business practices. In

fact, an e-procurement strategy should explicitly promote the use of the Internet and e-business systems among potential suppliers.

Success in the implementation of public e-procurement tends to result from broad consultation with representatives of government agencies and the private sector. A key objective of a strategy for all countries is to ensure that e-procurement is approached consistently across all spheres of government and that costs to suppliers are minimized. Furthermore, the process of developing an e-procurement strategy should go through a series of phases, each of which requires careful consideration. The process starts with the definition of the goals and vision of the project, followed by analysis and reform of the regulatory framework, analysis of existing processes, their re-engineering, the choice of a solution and platform, and the formulation and implementation of a plan, including the allocation and management of adequate resources, the training of human resources and often the empowering of lower-level management to take decisions.

An initial e-procurement strategy for a developing country does not necessarily entail a comprehensive e-procurement solution, such as an electronic tendering system, an electronic market place for the procurement of goods and services online, or a government website that provides a single point of entry to all government business opportunities. The implementation of e-procurement may begin with a single improvement, such as posting online updated tender information.

Any e-procurement system will require a high level of interoperability to ensure that no potential bidder is excluded because it does not use the same computer systems and applications as the Government. This can be enhanced by the use of open technologies. Also, free and open source software (FOSS) does not require suppliers to adapt their data to a proprietary format or convert them into such a format, such a requirement potentially increasing the costs of suppliers and constituting a barrier to smaller companies. In addition, the use of FOSS may encourage ICT spending with local companies and support local SMEs in the ICT sector. FOSS is also easily adaptable to local languages.

Nevertheless, proprietary e-procurement solutions remain an option for Governments. Agreements with vendors of proprietary solutions may provide them with a simplified way of ordering and acquiring products and licences; at the same time they would be able to track software licence acquisitions through online order confirmations and summaries. For a Government, acquiring original, proprietary software and licences allows it to benefit from the vendor's advice and latest technology.

The cost of commercially available e-procurement solutions will depend on whether they involve applications that are focused on sourcing activities (e.g. bidding, supplier registration, tender management) and/or purchasing activities (e.g. electronic invoicing and payments), or both. When an e-procurement solution is being created, the costs incurred by the following will have to be considered: licensing (software costs are believed to be only 10 per cent of the overall project costs), external and internal resources, implementation and maintenance, integration into existing resource planning solutions, process design, configuration and customization, training and communication, internal systems and bandwidth, software upgrades and reorganization costs. From an infrastructure point of view, however, e-procurement solutions can be stand-alone, with no more than a data interface with back-office systems. This is often seen as an interim solution until all resource planning platforms are integrated, such integration providing the greatest transaction cost benefits.

An option for financing the implementation of e-procurement is a build-operate-transfer (BOT) scheme, such as the one adopted by the Government of Malaysia in order to set up its e-procurement system, e-Perolehan. E-Perolehan was financed through a BOT scheme involving an e-commerce joint venture company consisting of Puncak Semangat Sdn. Bhd. and NTT Data Corporation, which undertook the total financing of the project in exchange for exclusive service operator rights in respect of the Malaysian supplier community. The value of transactions by the end of 2004 is estimated to reach 1 billion Malaysian ringgit ($260 million), with expected growth as adoption of the system expands. The average cost per transaction has been reduced from $250 to an average of $17.

E-procurement systems are best used for the purchase of those goods and services that are needed by all departments across an organization. These are typically commodities and include office supplies,

computers and related equipment, maintenance services, and facilities such as meeting rooms and travel. Those things required for the operations of specific departments – civil engineering services for the construction of a new road, for example – are more specific and specialized, and cannot benefit from the economies of scale that an e-procurement system requires in order to justify its cost.

Governments in developing countries must be aware that e-procurement does not necessarily mean a comprehensive e-procurement solution, but rather could entail cost-effective process improvements that steer a government department in the direction of e-procurement and are tailored to the available resources. For example, orders can be placed by e-mail, or via an integrated online order management system that extends across the length and breadth of the supply chain.

In order to classify the suitability of any e-procurement strategies, developing countries may need to consider more than the efficiency benefits, carefully evaluating the level of public and private sector e-readiness and the relevance of partial or fully integrated e-procurement to their own e-government and business development strategies.

On the one hand, it can be argued that there is little use in proposing e-procurement in countries where only certain suppliers will be in a position to take advantage of it, and where SMEs may be excluded from the public procurement market (offline and online). On the other hand, e-procurement can lead to the development of ICT and transactional capabilities in government that can be applied to other areas, as well as in the business community. Transitional measures can be adopted so that local suppliers that initially may not be able to access e-procurement systems are not excluded.

In any case, developing countries should bear in mind that the adoption of e-procurement can be a scalable process that will limit the waste of limited resources and allow users to gradually build up the relevant capabilities. To maximize initial adoption, projects should target first those agencies and suppliers that will have immediate use for e-procurement, enlisting their support and addressing the concerns of government workers whose role might change as a result of innovation. This is applicable to any e-government project.

Return on investment will be achieved over time in terms of cost savings and increased revenue. In the context of their e-government strategies and regardless of transactional capabilities, developing countries that have not already explored e-procurement could envisage the enhancement of G2B interaction by posting tender information and forms online, and promoting awareness within the business community and the registration of potential suppliers. A portal for transactional services can be a longer-term goal that will result from a general process reform that will entail consolidating and streamlining public procurement and related government processes, and enhancing their transparency.

6. PROTECTING COMPETITIVENESS IN THE ICT SECTOR: THE CASE OF TUNISIA

The Report examines laws and regulatory regimes designed to control the use and abuse of personal data – that is, data that directly or indirectly identify the individual. In an information economy, particularly as manifested on the Internet and in electronic commerce, personal data have become an increasing by valuable asset. As a consequence, many developed nations have adopted laws and rules to control the use of such data, generally referred to as data protection laws. Different jurisdictions have chosen various approaches to the problem of data protection, and this has posed problems of coordination, especially in case of transborder flows of data. Privacy laws governing the processing of personal data are particularly comprehensive in Europe. In most European jurisdictions it is prohibited to transfer data to another jurisdiction that does not provide adequate protection. The "adequacy provision" could affect countries without such protection in their business with European countries. Developing countries wanting to participate in the global information economy and thereby facilitate the free flow of information from developed to developing countries therefore have to consider the need for similar laws and rules to protect an individual's private life.

The Report examines the types of personal data that are disclosed through our Internet-related activities, as well as through the use of the Internet by others to make available information concerning us. Such data are categorized as those that we consent to others collecting and using (consensual data) and those that are incidental to our activities, and are obtained with neither our knowledge nor consent (non-consensual data). Another category that receives special treatment in most legislations but whose borders vary according to the different traditions is that of sensitive data.

Privacy principles, or fair information processing principles, have been developed by various international organizations to protect an individual's right to privacy with regard to his/her personal data, and these are highlighted in the Report. There is general international agreement about the issues that should be addressed, including the process of collection, use and disclosure to others. The advantage of a principles-based approach to the regulation of data protection is the avoidance of technological redundancy, whether concerning mainframe computer systems or the Internet.

While there is general consensus concerning the principles underpinning data protection laws, the Report examines three different approaches to regulation of the issue: comprehensive, sectoral and self-regulatory or co-regulatory. The first of these involves the establishment of a regulatory authority to oversee compliance with the data protection regime and operate as a surrogate for individuals in the enforcement of their rights. The sectoral approach involves the adoption of rules addressing the specific concerns of an industry or trade practice, and is most often found in the banking and financial services sector, as well as among professionals such as doctors and lawyers. Self-regulation or co-regulation looks to those that collect and process personal data to adopt and comply with the data protection principles.

All three regulatory approaches address the issue of transborder data flows, and the ease with which information, including personal data, can be transferred across national borders, thereby potentially circumventing or avoiding the regulatory regime within which the personal data were originally obtained. Controls on the transborder flow of personal data from developed countries may act as a barrier to trade with developing countries. The Report examines the different legal mechanisms that may be used to avoid such barriers: adequate or comparable control regimes, contracts or "safe harbour" arrangements.

A survey of member States was carried out. It revealed a lack of understanding of the nature and importance of data protection regimes and a consequent need for educational initiatives to help developing countries address this problem.

Finally, certain policy recommendations are made in the Report concerning such matters as the regulatory costs involved for both the public and the private sector, and how to minimize them through sectoral and self-regulatory mechanisms, as well as through cooperation with regional trading partners.

7. ASSESSING COMPETITIVENESS IN THE ICT SECTOR: THE CASE OF TUNISIA

According to recently published economic indices, Tunisia occupies a leading position among developing countries with respect to its development of ICTs and competitiveness. This in part reflects the efforts made by the Tunisian Government to implement ICT policies on infrastructure, institutions, legislation and education, and to create a supportive environment for the adoption of ICTs. As host to the second phase of the World Summit on the Information Society, the Government is determined to develop Tunisia into a knowledge-based society.

Most dependent on the ICT environment is the ICT sector itself. In Tunisia, the sector has been growing rapidly during the past five years, in particular software and IT services. In recognition of the important role that the sector plays in driving the country's technological development, one of the Government's priorities has been to develop a

strong and competitive ICT sector. The Report presents an analysis of the Tunisian ICT sector and identifies links between ICT policy measures, the national and international business environment, corporate strategies and enterprise performance. It also examines the extent to which national ICT policies enable ICT companies to enhance their competitiveness, particularly in foreign markets.

The analysis follows Porter's competitiveness diamond model and describes demand and factor conditions, related and supporting industries and firm structure and strategy, so as to determine the specific business environment the ICT sector is facing. It also critically evaluates the national ICT strategy, in particular with respect to ICT infrastructure, business development support and IT skills and education. The report finds that Internet usage is still fairly low in the country, despite efforts by the Government to improve access. While the supply of highly skilled labour in ICT-related fields is growing, overall adult literacy rates are still low. These are important areas for policy action to advance the Tunisian information society.

On the basis of a survey of IT service companies, the report concludes that companies need to prepare to take an important step, namely the leap from opportunity to strategy. This is particularly the case for firms planning to expand their export businesses. The survey reveals that for companies to keep their competitive advantages, they need to define clear strategies and carry them out successfully. Strategies have to reflect the firms' target markets. For example, companies focusing on the regional market (mainly the Arab region and Africa) need to develop competitive advantages based on firm-specific resources and their proximate business environment. Basic factor advantages, such as low labour cost, do not apply in the regional market, whereas cultural proximity is important. By contrast, firms focusing on export markets (for example, Western Europe) need to develop basic factor advantages and meet higher technological requirements, whereas cultural proximity is less critical.

The Report also suggests that the solutions and services offered by the firms are too widespread and that greater specialization could help increase the productivity of companies and hence their competitiveness. Companies entering the regional market or markets in developing countries should focus more on the value added of their products and services, whereas firms focusing on the European or North American market should take advantage of basic factor conditions available in Tunisia (such as low wages).

As far as the enabling business environment is concerned, and the success of government policies to promote the sector, the Report suggests that more needs to be done to address the particular needs of firms in the ICT sector. This includes the adoption of policies related to enhancing the ICT infrastructure, in particular as regards access, pricing and local content, and providing finance, skills and education, not only in IT-related fields, but also in project management and business development.