

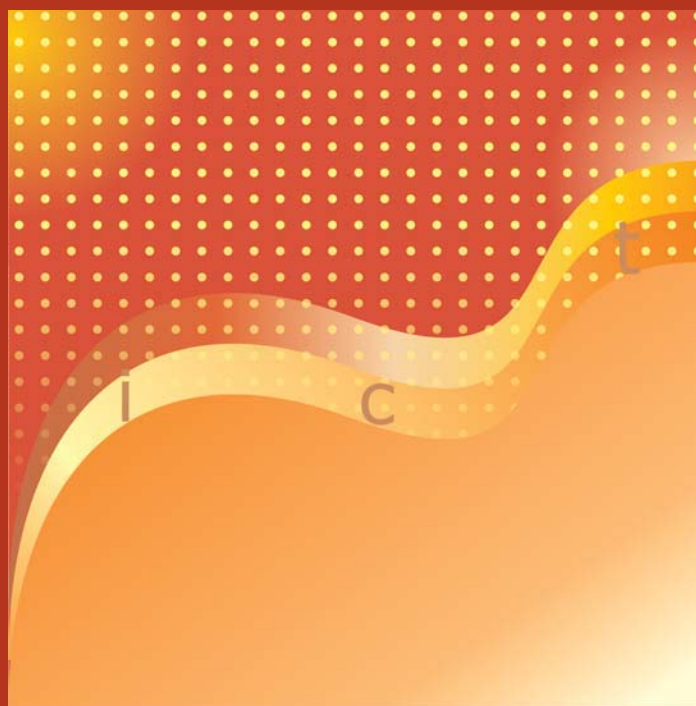
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United Nations Conference on Trade and Development

INFORMATION ECONOMY REPORT 2007-2008

Science and technology for development:
the new paradigm of ICT
OVERVIEW



United Nations

UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

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UNITED NATIONS
New York and Geneva, 2007

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UNCTAD/SDTE/ECB/2007/ (Overview)
UNITED NATIONS PUBLICATION

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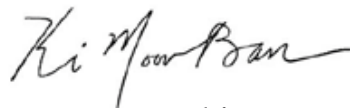
Foreword

The world economy is increasingly driven by technological innovations. If developing countries are to seize the opportunities this implies, and also to address emerging global challenges, they will have to harness those innovations and the knowledge that comes with them.

UNCTAD's Information Economy Report 2007/2008: science and technology for development, the new paradigm of ICT analyses the current – and potential – contribution of ICT to knowledge creation and diffusion. It looks at how developing countries use technology to generate innovations that improve the livelihoods of the poor and support enterprise competitiveness. And it examines the impact of ICTs on productivity and growth, international trade and employment in developing countries.

But mastering technology is not enough; it must, as the report also stresses, be complemented by government policies to develop the ICT sector – by providing incentives, for example, and by building national institutional capacity for knowledge creation and diffusion. At the international level, more effective technology transfer and knowledge-sharing are needed, which can be achieved through more flexible intellectual property rights regimes, open access to knowledge, and international partnerships. Development partners, in turn, can also help close the digital divide, including through technical assistance and funding of ICT infrastructure.

We are now at the midpoint in the timeline set by the international community for achieving the Millennium Development Goals. The eighth goal – developing a global partnership for development – included making available the benefits of new technologies, especially information and communication technologies, in cooperation with the private sector. This report makes an important contribution to our understanding of how to achieve that.



Ban ki-moon

Secretary-General of the United Nations

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Harnessing knowledge for development

It is now well established that technological progress and innovation are the long-term drivers of economic growth. In the context of a global knowledge economy fuelled by the fast pace of technological innovation, it is important for developing countries to lay good foundations for building their capacity to acquire and create knowledge and technology in order to take advantage of the opportunities offered by globalization and, at the same time, to address emerging global challenges. The challenge is therefore to harness knowledge for development – by providing an enabling environment for the production of ideas and innovations, as well as for their dissemination and use by different actors, directly or indirectly involved in the production process.

In this broader context of science and technology for development, the *Information Economy Report 2007/2008* is analysing the contribution of information and communication technology (ICT) to growth and development. As in the case of other technologies, the ICT contribution is determined by factors such as the role of human capital, externalities and spillovers (notably through learning and complementary innovation), and appropriate policies and institutions supporting innovations. The analysis highlights the importance of open access to knowledge and, hence, the importance of diffusion and sharing of knowledge and technology, especially in the case of developing countries.

The institutional framework should ensure a good flow of knowledge between scientific research and technological applications, as well as a good flow of

information among researchers and users, at the national and the international level. Governments play a crucial role, because knowledge creation cannot rely on market mechanisms alone. Policies to support knowledge creation (such as government funding, government procurement, tax subsidies and intellectual property protection) as well as knowledge diffusion (establishment of libraries, communication networks, access cost subsidies, etc.) are examples of government measures in this area. A clear legal and regulatory framework in many areas touching upon the interactions and transactions among different actors is also necessary.

The market for knowledge is often characterized by imperfections - that is to say, social and private returns derived from knowledge can widely differ. In the area of knowledge creation, this “market failure” may lead to private underinvestment in knowledge: that is why Governments have taken measures to provide incentives for individual agents to create knowledge, namely through intellectual property rights (IPRs), tax rebates and subsidies, and full or partial funding of research. In particular, intellectual property protection through patents, trademarks, copyrights or trade secrets confers the right to appropriate the income derived from the application of proprietary research in order to recover the high fixed cost of research. However, the approach to IPRs needs to strike a balance between incentives for creativity and society’s interest in maximizing the dissemination of knowledge and information.

Knowledge is increasingly being privatized and commercialized, and the use of IPRs to protect knowledge has restricted access to information and technologies. Furthermore, the international governance of knowledge has moved towards tighter and more harmonized IPRs at the international level, with a view to minimizing the free-rider problem. This has been achieved through the World Trade Organization’s Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), the “TRIPS-plus” provisions of regional and bilateral trade agreements negotiated by the European Union (EU) and the United States, and new treaties negotiated under the auspices of the World Intellectual Property Organization.

In the area of knowledge diffusion and technology transfer, externalities and spillovers can bring enormous benefits for the economy as a whole, and for the rest of world, derived from technology flows among countries. In some instances knowledge can be considered to be a public good (non-rivalrous and non-excludable). Many inventions were built on earlier inventions (“standing on shoulders of giants”) and the benefits of technological progress are not just limited to one firm or one sector, because of complementarities in the application and generation of knowledge, and are thus extended to the economy as a whole. The benefits of externalities and spillovers may not be fully reaped because of high access costs or other protectionist obstacles. In the case of cross-border flows of knowledge, high access costs and barriers resulting from a harmonization and tightening of IPR standards at the international level may be harmful for poorer countries with limited human and capital capacity. While market failures in the area of technology diffusion may be important, measures to address them have not been clearly identified, especially with regard to the transfer of technology from developed to less developed countries.

Many approaches to encourage more effective transfer of technology to developing countries have been suggested:

- Improving flexibilities in IPRs, in terms of calibration of standards and norms for countries with varying levels of development.
- Open access systems. The key feature of open access systems is that the knowledge is put in the public domain. In some areas involving extensive cumulative innovation, such as computer software, biotechnology or other

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