



United Nations  
Educational, Scientific and  
Cultural Organization

Information  
for All  
Programme



## INFORMATION SOCIETY POLICIES. ANNUAL WORLD REPORT 2009

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United Nations  
Educational, Scientific and  
Cultural Organization

Organisation  
des Nations Unies  
pour l'éducation,  
la science et la culture

Organización  
de las Naciones Unidas  
para la Educación,  
la Ciencia y la Cultura

Организация  
Объединенных Наций по  
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منظمة الأمم المتحدة  
للتربية والعلم والثقافة

联合国教育、  
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## INTRODUCTION

Assistance to UNESCO Member States in the formulation of national information policy frameworks has been the main focus of the Information for All Programme's activities in 2008-2009. On this basis, the following body of work has been achieved:

- Preparation of a 150-page document National Information Society Policy: A Template designed to assist UNESCO Member States in the development, updating and refinement of appropriate, comprehensive, forward-looking and sustainable national e-strategies, including ICT strategies and sectoral e-strategies as appropriate, as an integral part of national development plans and poverty reduction strategies..
- Establishment of an online IFAP Information Society Observatory (<http://ifap-is-observatory.ittk.hu/>), continuously updated with new, relevant strategic documents, events, books and experiences, annotations and links, following the development of the field. The Observatory makes accessible up-to-date information grouped, in the first instance, around the IFAP priority areas: Information for development; Information accessibility; Information literacy; Information ethics and Information preservation.
- Publication of 5 Information Society Observatory Newsletters, updating users on new entries and additions to the Observatory;
- Publication of the present Information Society Policies. Annual World Report.

We begin this Report, perhaps untypically, with a list of major 2009 international and national policy and analytical documents in the Information Society field, so you can refer to them directly, instead of reading summaries here. This is followed by a review of salient Information/Knowledge Society policy issues, as they emerged in 2009.

The Report was written by researchers of the Information Society Research Institute of Budapest University of Technology and Economics. The contents of this publication do not reflect the views or policies of UNESCO. The authors are: Andrea Gyarmati (gender, labour market), Barbara Sólyom (e-Health), Mihály Csótó (penetration, broadband, green IT), Mihály Nyáry (free software), Szilárd Molnár (digital divide, e-government, social networking), Tamás Borovitz (technological trends), Tímea Kovács (penetration).

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**Table of Contents**

- 1. Executive summary ..... 6**
- 2. Major 2009 international and national policy and analytical documents in the Information Society field ..... 8**
- 3. Important trends in the Information Society ..... 16**
  - 3.1 Digital divide..... 16
    - 3.1.1. Best practices in mobile technology ..... 20
  - 3.2 Labour market..... 21
  - 3.3. Technological trends..... 24
  - 3.4 The importance of life - e-Health..... 28
- 4. e-Government..... 30**
  - 4.1 The impact of the economic situation..... 30
  - 4.2 Breakthrough to open source software..... 31
  - 4.3 Green e-government..... 31
  - 4.4 E-voting pushed into the background ..... 32
  - 4.5 Blog democracy ..... 33
- 5. Information Society breakthroughs..... 34**
  - 5.1 Social networking..... 34
    - 5.1.1 Do online networks alienate or unite people? ..... 36
    - 5.1.2 Cultural revolution ..... 38
  - 5.2 The world of free software ..... 38
    - 5.2.1 Netbooks ..... 40
    - 5.2.2 Mobile phones and smart phones ..... 40
  - 5.3 Green IT – towards a sustainable information society ..... 41
- 6. ICT Uptake: Overview..... 43**
- 7. ICT Uptake: Regional Breakdown ..... 47**
  - 7.1 Africa ..... 48

7.2 Central and South America, the Caribbean.....	50
7.3 Asia.....	51
7.4 Europe.....	52
7.5 Broadband .....	53
<b>8. Bibliography.....</b>	<b>58</b>

**List of Tables and Figures**

Figure 1.: GDP percentage point increase due to 10 percentage-point increase in penetration ..... 18

Figure 2.: Distribution of employment by sector (sectoral employment as percentage of total employment), by sex and region 2008 ..... 22

Figure 3.: Internet penetration by national averages..... 23

Figure 4.: Number of internet users, mobile cellular telephone subscriptions, fixed telephone lines – trend analysis..... 44

Figure 5.: Global penetration..... 45

Figure 6.: TV vs. PC – in billions of households ..... 46

Table 1.: Regional differences in Internet usage..... 47

Figure 7.: Penetration rate by region..... 48

Figure 8.: Mobile and electricity penetration in Africa..... 49

Table 2.: Internet penetration in Africa - ranking..... 49

Figure 9.: Mobile, internet, fixed telephone in Africa..... 50

Figure 10.: Internet users in the Americas ..... 50

Table 3.: Internet penetration in Americas - ranking..... 51

Table 4.: Internet penetration in Asia..... 51

Table 5.: Individuals using the internet on average daily or almost every day - Europe..... 52

Figure 11.: Broadband in the World..... 54

Table 6.: Broadband and quality of services – worldwide outlook..... 55

Figure 12.: Top 30 economies in terms of fixed broadband subscribers per 100 population, 2008..... 56

Table 7.: Broadband subscribers and market penetration..... 57

## I. Executive summary

The first part of our annual report is a document overview. The list could not be complete as the number of publications dealing directly and indirectly with the development of information society is close to dozens of thousands every year – which also indicates the growing importance of this topic. However, the number of major policy documents and authentic and professional surveys is limited – we chose more than 20 excellent pieces from these and recommend them to the attention of our Readers.

This is followed by a major thematic section highlighting the important trends of information society during the last year. Besides the development of recent social diversifications and differences, the most important effect of the information society is possibly the fact that it eliminates several historical divides. The developing and strengthening of social diversification caused by the unequal distribution of ICT tools is proved to be eliminated by the same tools, which causes a paradoxical situation. Digital diversification appears at numerous stages and by different methods. The cultural differences of digital diversification are well outlined; we make a short overview on the regional differences of this symptom and we highlight one solution offered by information society – the economic effects of broadband internet. The expansion of mobile technology might present a similar tool with significant effect; therefore, we introduce some really well-operating solutions from this area.

The key areas of information policy in the social sphere obviously vary from country to country. In some countries the main key area is the influence of labor market; in other countries the increasing of life quality and in some other the safeguarding of basic human rights.

The labor market is a critically important issue for all government; it is the pillar of competitiveness and stability in all countries. In the last quarter of the century the biggest changes can be observed in the labor market of the world. The previously fixed and traditional type of work has increasingly changed into atypical work. However, during last year there was a breakthrough in another field – women became more prominent in labor markets, both in number and importance. For this reason, we discuss this trend more comprehensively in our current report.

Social changes induce technological changes – nevertheless, it is also true that technological achievements engender social changes. Among the most significant trends we highlighted and introduced several important technical achievements; all of them are expected to change people's lives in several aspects. We specially emphasized the field of e-Health. Also emphasized is the fact that technology improves quality of life.

Information society strategies increasingly focus on e-government – in view of both back-office and front-office processes. Accordingly, current trends of e-government are examined here, such as the sweep of open source code, the expansion of green IT, the falling of e-voting and the development of blog democracy.

Instead of the original technological approach, e-government concepts are now socially oriented, which is perceived as a meta-trend.

We have identified three areas where there was a breakthrough last year. First is the social network, for which 2009 was the year of quantitative – and perhaps qualitative - breakthrough. The increasing importance of open source software (open culture on higher level) and the green IT is also inevitable. No information society strategy today can disregard these important trends.

In the last section we provide an overview of the worldwide penetration of ICT tools, both globally and regionally. This clearly show the social and policy challenges faced by particular regions.

## 2. Major 2009 international and national policy and analytical documents in the Information Society field

### **Information for All Programme, UNESCO: National Information Society Policy: A Template**

It is an established objective of UNESCO to assist in the formulation of national information policy frameworks, in particular within the framework of the Information for All Programme (IFAP). The Tunis Agenda for the Information Society contains a direct appeal for the development of such frameworks. Taking into consideration the leading role of governments in partnership with other stakeholders in implementing the WSIS outcomes (including the Geneva Plan of Action) at the national level, we encourage those governments that have not yet done so to elaborate, as appropriate, comprehensive, forward-looking and sustainable national e-strategies, including ICT strategies and sectoral e-strategies as appropriate, as an integral part of national development plans and poverty reduction strategies, as soon as possible and before 2010. The Template is designed to assist in the development of such policies and strategies.

<http://ifap-is-observatory.ittk.hu/node/261>

### **Rohan Samarajiva - Ayesha Zainudeen: ICT Infrastructure in Emerging Asia: Policy and Regulatory Roadblocks**

8

This book brings together scholars, practitioners, former regulators, and policymakers to address the problem of expanding information and communication technology (ICT) connectivity in emerging Asia. It centrally engages the widespread claim that technology by itself — independent of policy and regulatory reform — can improve access to ICTs. In doing so, it shows that while complex workarounds are possible, they are significantly less effective than the appropriate policy and regulatory reforms.

[http://www.idrc.ca/en/ev-117916-201-1-DO\\_TOPIC.html](http://www.idrc.ca/en/ev-117916-201-1-DO_TOPIC.html)

### **UNESCAP: Background Paper for Identifying the Best Practice of ICT Implementations in Asia and the Pacific**

This 36-page paper describes and assesses major and strategic information and communication technology (ICT) projects that have been undertaken in Asia and the Pacific with a view to expanding ICT access. It emerges from an October 19-20 2009 meeting in Bangkok, Thailand, organised by the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP)'s Information and Communications Technology and Disaster Risk Reduction Division (IDD). The "Sub-regional Workshop on Strengthening ICT Policies and Applications to Achieve MDGs and WSIS goals in South-East Asia and the Pacific" presented the findings of the in-depth research and analysis on the current status of ICT



access in the region and examined policy options at the national level, taking into account new and emerging technologies.

[http://www.unescap.org/idd/events/2009\\_sRW-MDG-WVIS-SEAsia%20and%20Pacific/ICT%20research%20paper\\_revised%20161009.pdf](http://www.unescap.org/idd/events/2009_sRW-MDG-WVIS-SEAsia%20and%20Pacific/ICT%20research%20paper_revised%20161009.pdf)

### **Yumiko Myoken: Overview of ICT Strategy in Japan**

The rapid development of information communication technology (ICT) has underpinned Japan's economic growth for the last few decades. With fierce competition in the global ICT market, the Japanese government announced the 'IT New Reform Strategy' and 'U-Japan' to realize a sustainable IT society with a strong aim to make Japan a front runner in IT by 2010. This paper gives an overview of the current ICT condition in Japan, including Research and Development and Japan's strength and weakness in the field of ICT, as well as Japan's government policy on ICT.

[http://ukinjapan.fco.gov.uk/resources/en/pdf/5606907/5633632/Overview\\_of\\_ICT\\_Strategy.pdf](http://ukinjapan.fco.gov.uk/resources/en/pdf/5606907/5633632/Overview_of_ICT_Strategy.pdf)

### **ITU: Measuring the Information Society - The ICT Development Index 2009 Edition**

The latest edition of Measuring the Information Society features the new ITU ICT Development Index. The Index captures the level of advancement of ICTs in more than 150 countries worldwide and compares progress made between 2002 and 2007. It also measures the global digital divide and examines how it has developed in recent years. The report also features a new ICT Price Basket, which combines fixed, mobile and broadband tariffs for 2008 into one measure and compares it across countries. The analytical report is complemented by a series of statistical tables providing country-level data for all indicators included in the Index.

<http://www.itu.int/ITU-D/ict/publications/idi/2009/index.html>

### **OECD Publishing: Internet Access for Development**

This book examines how the market for internet traffic exchange has evolved and explores the coherence of policies pursued by developed and developing countries. It notes the increasing innovation occurring in a number of developing countries with competitive markets and discusses how liberalisation has helped to expand of access networks and make ICT services increasingly affordable and available to the poor. The report also highlights the employment, micro-entrepreneurial and social development opportunities which have emerged as access levels have risen among low-income users. The study notes that gateway service monopolies - still in 70 countries - raise the prices for accessing international capacity and reduce the affordability of Internet access to business and end users.

<http://www.oecdbookshop.org/oecd/display.asp?CID=&LANG=EN&SFI=DI&STI=5KZBVK64FV6G>

[http://portal.unesco.org/ci/en/ev.php-URL\\_ID=28958&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/ci/en/ev.php-URL_ID=28958&URL_DO=DO_TOPIC&URL_SECTION=201.html)

### **Unctad.org: Information Economy Report 2009**

The Information Economy Report 2009: Trends and Outlook in Turbulent Times is the fourth in a series published by the United Nations Conference on Trade and Development (UNCTAD). The report is one of the few publications to monitor global trends in information and communication technologies (ICTs) as they affect developing countries. It serves as a valuable reference for policymakers in those nations. It gives special attention to the impact of the global financial crisis on ICTs.

<http://www.unctad.org/Templates/webflyer.asp?docid=11915&intItemID=2068&lang=1&mode=downloads>

### **Erwin Alampay (editor): Living the Information Society in Asia**

Asian societies are in a period of transition, as people are learn to live with new information and communication technologies (ICTs). Whether at work, at home, at school, or at large, ICTs are having an impact on day-to-day lives. How can mobile phones help to forge relationships within families that have been separated by migration? How do camera phones threaten personal space? How are cultural identities strengthened in call centres? How is religion being incorporated into the new ICTs? Living the Information Society in Asia describes the interaction of people and ICTs as these technologies seep into everyday life, and examines implications for policy and future research.

[http://www.idrc.ca/en/ev-137700-201-1-DO\\_TOPIC.html](http://www.idrc.ca/en/ev-137700-201-1-DO_TOPIC.html)

### **ITU: Information Society Statistical Profiles 2009 – Americas 2009**

This report is the third of a series of regional statistical profiles on the information society prepared by ITU in 2009, as an input to the regional preparatory meetings (RPMs) for the ITU World Telecommunication Development Conference 2010 (WTDC-10). The third RPM – for the Americas region – takes place on 9-11 September 2009 and is hosted by the Government of Colombia.

### **Mohammed bin Rashid Al Maktoum Foundation and United Nations Development Programme: Arab Knowledge Report 2009: Towards Productive Intercommunication for Knowledge**

The Report focuses on the organic relationship within the knowledge-society-development triad that is linked to modernisation, productive openness to both the inside and the outside, and all that contributes towards the strengthening of Arab human dignity.

<http://www.mbrfoundation.ae/English/pages/AKR2009.aspx>

## **Richard Heeks: The ICT4D 2.0 Manifesto: Where Next for ICTs and International Development?**

This paper explains the phase change – from "ICT4D 1.0" to "ICT4D 2.0" – and its implications. The background to these phases is reviewed, charting the logic and chronology of applying ICTs in developing countries. The implications of the phase change are then analysed. First, in terms of new technology and application priorities. Then, in relation to new models of innovation we may need to embrace: from laboratory to collaborative to grassroots innovation. Next, in relation to new implementation models for funding, managing, and applying digital technology. Finally, the paper looks at necessary new worldviews to guide our thinking and our policies in this field; integrating perspectives from computer science, information systems and development studies. Additional commentaries and models provide a further set of rich insights into the future of ICT4D.

[http://www.sed.manchester.ac.uk/idpm/research/publications/wp/di/di\\_wp42.htm](http://www.sed.manchester.ac.uk/idpm/research/publications/wp/di/di_wp42.htm)

## **Shahid Akhtar - Patricia Arinto: Digital Review of Asia Pacific 2009–2010**

The biennial Digital Review of Asia Pacific is a comprehensive guide to the state-of-practice and trends in information and communication technologies for development (ICTD) in Asia Pacific. This fourth edition (2009–2010) features 30 economies and four subregional groupings. The chapters provide updated information on ICT infrastructure, industries, content and services, key initiatives, enabling policies, regulation, education and capacity building, open source and R&D initiatives, as well as key ICTD challenges in each of the economies covered. The common framework that underpins these reports allows readers to undertake a comparative analysis and assess progress across the region.

[http://www.idrc.ca/en/ev-137877-201-1-DO\\_TOPIC.html](http://www.idrc.ca/en/ev-137877-201-1-DO_TOPIC.html)

## **Alison Gillwald - Christoph Stork: ICT access and usage in Africa**

This paper reports on the findings of the second household and individual user survey of access and usage conducted by RIA between 2007 and 2008 across 17 African countries. It builds on the first household survey conducted by RIA in 2004/5 and a number of subsequent supply-side studies that have demonstrated that across the continent, even where there has been overall sector growth, sector performance has been sub-optimal. For the most part, the primary national policy objectives of delivering affordable access to telecommunications have not been met.

[http://www.researchictafrica.net/new/images/uploads/ria-policy-paper\\_ict-access-and-usage-2008.pdf](http://www.researchictafrica.net/new/images/uploads/ria-policy-paper_ict-access-and-usage-2008.pdf)

### **Chris Westrup - Saheer Al-Jaghoub: Nation States, Networks of Flows and ICT-Enabled Development: Learning from Jordan**

This paper argues that information and communication technology (ICT)-enabled development needs to be conceptualised within a dialectic process of globalisation where, on the one hand, the flows of capital, commodities and information are expanding and accelerating while, on the other, nation states are essential components in providing the infrastructures for production, regulation and consumption of these flows. For countries with developmental strategies, this has led to the emergence of developmental network states where a networked polity of private/public agencies are central to global processes linking the global movement of capital, commodities and information with local circuits of capital, labour and infrastructure.

[http://www.sed.manchester.ac.uk/idpm/research/publications/wp/di/di\\_wp33.htm](http://www.sed.manchester.ac.uk/idpm/research/publications/wp/di/di_wp33.htm)

### **Ineke Buskens - Anne Webb: African Women and ICTs: Investigating Technology, Gender and Empowerment**

The revolution in information and communication technologies (ICTs) has vast implications for the developing world, but what tangible benefits has it brought when issues of social inclusion and exclusion, particularly in the developing world, remain at large? In addition, the gender digital divide is growing in the developing world, particularly in Africa. So what do ICTs mean to African women?

[http://www.idrc.ca/en/ev-135944-201-I-DO\\_TOPIC.html](http://www.idrc.ca/en/ev-135944-201-I-DO_TOPIC.html)

[http://www.itu.int/dms\\_pub/itu-d/opb/ind/D-IND-RPM.AM-2009-E09-PDF-E.pdf](http://www.itu.int/dms_pub/itu-d/opb/ind/D-IND-RPM.AM-2009-E09-PDF-E.pdf)

### **James Enck - Taylor Reynolds: Network Developments in Support of Innovation and User Needs**

High-speed broadband networks are a platform supporting innovation throughout the economy today in much the same way electricity and transportation networks spurred innovation in the past. New innovations such as smart electrical grids, tele-medicine, intelligent transportation networks, interactive learning and cloud computing will require fast communication networks to operate efficiently. Telecommunication companies have been investing to upgrade their older copper and coax cables to new fibre lines which have vastly larger capacity but the economic crisis has threatened to halt this investment just when consumers and businesses are using more Internet bandwidth. Telecommunication investment largely mimics GDP (gross domestic product) growth - but in a more exaggerated way.

[http://www.oalis.oecd.org/oalis/2009doc.nsf/LinkTo/NT0000889E/\\$FILE/JT03275973.PDF](http://www.oalis.oecd.org/oalis/2009doc.nsf/LinkTo/NT0000889E/$FILE/JT03275973.PDF)

## **Khushbu Tilwawala - Michael David Myers - Antonio Díaz Andrade: Information Literacy in Kenya**

There are a growing number of information and communications technologies (ICT) initiatives in developing countries. These initiatives are usually undertaken on the basis that they are important for social and economic development. However, one barrier to the efficient utilisation of ICT in developing countries is the relatively low level of information literacy. Without the ability to manipulate and use information effectively, investments in ICT-for-development projects may be unsuccessful. In this research project, three ICT initiatives in Kenya are analysed in the light of the dimensions of information literacy. Implications for other developing countries are discussed.

<http://www.ejsdc.org/ojs2/index.php/ejsdc/article/view/613>

## **Pete Cranston: The potential of mobile devices in wireless environments to provide e-services for positive social and economic change in rural communities**

This paper explores that landscape as a way to mark out the domain for discussion at the November 09 CTA Observatory, which attempts “to explore the potential of mobile devices in wireless environments to provide eservices for positive social and economic change in rural communities”.

<http://observatory2009.cta.int/pdf/Mobile-Devices-Discussion-Paper.pdf>

## **Stéphane Boyera: Mobile Web for Social Development Roadmap**

This document is the heart of the MW4D IG work. Its purpose is to understand the current challenges of deploying development-oriented services on mobile phones, evaluate existing technologies, and identify the most promising directions to lower the barriers of developing, deploying and accessing services on mobile phones and thereby creating an enabling environment for more social-oriented services to appear. This document is divided into two major parts. The first part presents the major challenges today for both developing and accessing mobile services, potential ways to bridge them with existing tools, technologies and infrastructure, and potential research directions to follow to provide a more comprehensive resolution or solution. The second part focuses on presenting the major technologies and the major options existing today to deploy content and applications on mobile phones. For each of these technologies, the document presents a short analysis of the technology's potential and the requirements in terms of infrastructure, devices, targeted end-users, and costs associated with implementation and delivery.

<http://www.w3.org/TR/2009/NOTE-mw4d-roadmap-20091117/>

## **Toby Mendel: The Right to information in Latin America: a comparative legal survey**

UNESCO's Office in Quito releases a legal survey on the right to information in Latin America, comparing the currently existing laws in 11 Latin American countries: Chile,

Colombia, Dominican Republic, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru and Uruguay. Conducted by Toby Mendel, this study confirms UNESCO's commitment to promote the right to information, in line with its strategic objective of enhancing universal access to information and knowledge.

### **UNCTAD: Manual for the Production of Statistics on the Information Economy 2009, Revised Edition**

UNCTAD has released its 2009 revised edition of the Manual for the Production of Statistics on the Information Economy to serve as a reference for national statistical offices and other producers of official statistics on business use of information and communications technology (ICT). The Manual provides a guide to data collection and analysis, international standards, and definitions. It also offers model questions for surveys on ICT use, and it reviews important institutional issues related to compiling ICT statistics.

<http://www.unctad.org/Templates/webflyer.asp?docid=10932&intItemID=1397&lang=1&mode=highlights>

### **World Economic Forum, the World Bank and the African Development Bank: The Africa Competitiveness Report 2009**

African businesses can become far more competitive, but African governments and their international partners will need to improve access to finance, resist pressure to erect trade barriers, upgrade infrastructure, improve healthcare and educational systems, and strengthen institutions.

<http://www.weforum.org/en/initiatives/gcp/Africa%20Competitiveness%20Report/index.htm>

### **Yingqin Zheng - Richard Heeks: Conceptualising Information Culture in Developing Countries**

The paper concludes that information culture can be conceived at multiple levels in terms of three interlinked dimensions – information literacy, information openness, and information norms. These provide the basis for a broader understanding of positioning vis-à-vis informatisation than earlier frameworks. Field data shows how actions can be seen to reproduce and reinforce a country's information culture. However, it also identifies broader tensions that affect many developing countries: marketisation/state-collectivism, globalism/nationalism, technology/manual, and other potential contradictions. These create a reflexive space for agency that helps to explain the dynamism and evolution of information culture.

[http://www.sed.manchester.ac.uk/idpm/research/publications/wp/di/di\\_wp34.htm](http://www.sed.manchester.ac.uk/idpm/research/publications/wp/di/di_wp34.htm)

**Association for Progressive Communications, APC: ICTs for democracy: Information and Communication Technologies for the Enhancement of Democracy - with a Focus on Empowerment**

This report examines the potential of information and communications technologies (ICTs) for advancing democracy and empowerment, with a special focus on Kenya, Tanzania and Uganda. Access to and the strategic use of ICTs have been shown to have the potential to help bring about economic development, poverty reduction, and democratisation – including freedom of speech, the free flow of information and the promotion of human rights. Based on signs of current democracy deficits in the case study countries, it is crucial that ICTs be made central to development cooperation and to approaches to advance democracy in the three countries.

[http://www.apc.org/en/system/files/SIDA\\_ICTs+for+Democracy.pdf](http://www.apc.org/en/system/files/SIDA_ICTs+for+Democracy.pdf)

**Association for Progressive Communications, APC: The APC ICT Policy Handbook (Second edition)**

The main text of the handbook has been written by experts in the field so that readers get a basic understanding of the issues. It can then be used as a platform for further investigation. Each chapter seeks to give an objective account of existing issues, rather than presenting any specific point of view. Where issues are controversial, the different viewpoints involved have been explained so that the reader has a clear view of the issues in dispute.

[http://www.apc.org/en/system/files/APCHandbookWeb\\_EN.pdf](http://www.apc.org/en/system/files/APCHandbookWeb_EN.pdf)

## 3. Important trends in the Information Society

### 3.1 Digital divide

The *digital divide* concept was initially used for the technical, physical barriers hindering the penetration of ICT tools; however, soon enough **emphasis shifted towards social barriers**. Thus, these days digital divide refers more to a social divide that develops according to who has access, enough competence and experience to benefit from digital services, modern electronic networks and who does not have all these or is unable to successfully and efficiently use ICTs.

Fast acquisition of information, contacting administrators, downloading and filling in forms, tax returns, banking transactions, e-learning, work and entertainment, communication with friends and family - and the list could go on - are made possible through computers, mobile telephones, the Internet and online applications based on these. The positive impact of these tools on society, economy, administration, democracy and small communities is becoming ever more obvious, which is why it is increasingly the case that those who are unable, cannot or are not willing to use ICT tools, those people who lack the digital literacy enabling the routine use of the Internet and mobile communications find themselves at a significant disadvantage.

**This new form of inequality is part of a bigger system of inequalities.** The problem of the digital divide will not be solved by merely decreasing the price of electronic devices and access, or the physical infrastructure. Moreover, the digital divide is similar to many other inequalities: it periodically reproduces itself, i.e. it will not end, and there will never come a time when social policies will not have to address this issue.

The digital divide **amplifies the already existing social inequalities** cumulatively. An important experience of developed countries is that the problem of the digital divide persists even in periods when ICT penetration in society is high, since new technologies and tools (e.g. broadband, mobile devices, Web 2.0, etc.) enter the markets, generating new lines of division. In addition to the usage versus non-usage dichotomy, the different skills of the users form an equally significant factor, which is mostly manifested in the dimensions of digital literacy, online self-expression skills, network-thinking and problem-solving skills.

The reasons for the development and deepening of the digital divide can be categorised into the following main groups:

- **Economic reasons:** for example high hardware prices, there is nowhere with free or inexpensive Internet use, etc.
- **Social reasons:** different levels of education, income, residence, etc.
- **Cultural reasons,** willingness: people not needing ICT, have not found any use for it, no model to follow, etc.



- **Content-related reasons:** no contents and/or services of interest, website in mother tongue not available, insufficient local information, contents, etc.

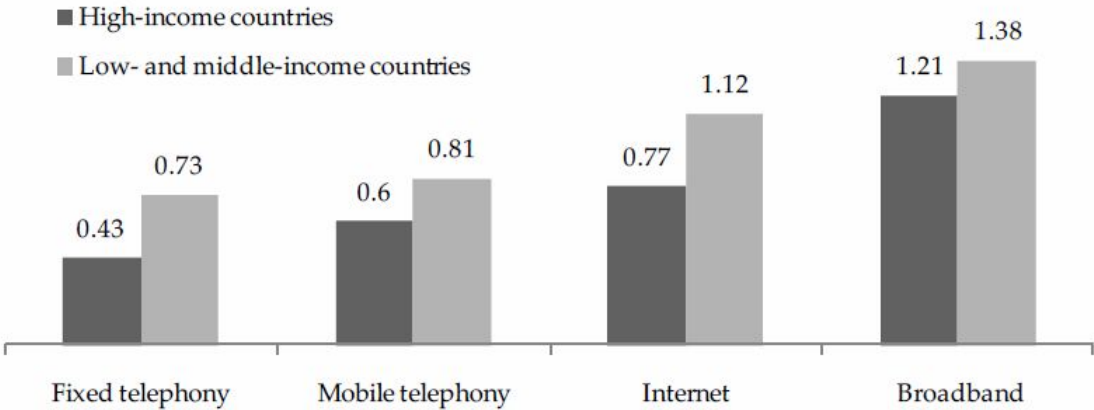
The struggle to bridge the digital divide is a long and perhaps never-ending process, further exacerbated by the fact that the solution requires a complex series of interventions in terms of social policy. Paradoxically, **ICT tools are being employed to solve the problem** of the digital divide, even though **these same tools generated and amplified it** through creating inequality in the area. The availability of ICT tools, actual usage as well as online contents and services can help to decrease social exclusion and create equal opportunity for participation in the information society.

In the future, the multifaceted skills, creativity, complex way of thinking, and empathy in dealing with clients, design thinking or 'right hemisphere thinking' will be increasingly important for employability. Digital literacy improves employability in three aspects: it is a *gate skill*, i.e. in many places candidates are screened for the presence or absence of digital skills; the ICT skill is one of the essential skills on the labour market; it works as a catalyst, i.e. it helps in the acquisition of other skills.

**Accelerating people's inclusion in the information society has become evident in developed and developing countries alike.** Inclusion and equal opportunities have also become important not only at the level of individual societies but also at the level of regions and even continents. Of course there are significant variations on the different continents in regard to the level of intervention and the target groups and means, since while in Europe the building of an inclusive, highly integrated information society is urged on an EU level, in the USA the same goal is realised far more on the level of settlements and small communities. In contrast, the third world is in dire need of the support of the more developed world which also serves its own laissez-faire economic interests.

**ICT penetration** also significantly **increases the competitiveness** of a given country. Countries across the developing world are looking to increase access to, and use of, broadband. In particular, broadband is seen as a general purpose technology that stimulates growth in the wider economy and creates new business opportunities. Given varying political and economic circumstances, however, it is impossible to provide universal solutions. The World Bank has found that **in low- and middle-income countries every 10 percentage point increase in broadband penetration accelerates economic growth by 1.38 percentage points - more than in high-income countries and more than for other telecommunications services.**

**Figure 1.: GDP percentage point increase due to 10 percentage-point increase in penetration**



Source: Yongsoo Kim, Tim Kelly, and Siddhartha Raja 2010

Policies aimed at reducing digital division are different in character, depending on their resources and objectives as well as their cultural and social background.

**In European culture, for example, the idea of social integration and inclusion has always played a very important role in traditions and people’s ways of thinking.** Accordingly, programmes launched here envision an increasingly fair and decreasingly fragmented society. The e-inclusion Ministerial Declaration of 2006 (Riga) approved by the leaders of 32 EU countries set definitive objectives: the digital divide between groups facing exclusion (the elderly, the unemployed, those living with disabilities) and the majority society must be reduced by fifty percent by 2010 in the EU, an objective that was unfortunately not met in most of the Member States.

In order to create a strong and highly inclusive information society the developed countries of the EU, North America and Asia employ ICT tools that improve the quality of life, considerably relying on broadband networks, the development of new skills and literacy, and the development of e-administration and e-health. **These countries clearly see that the digital divide is caused by a cumulative social disadvantage** and is also the cause of further inequalities; therefore specific measures are adopted to go beyond the traditional approaches in healthcare, social policy or employment (e.g. atypical employment, active old age, personalised e-administration, etc.).

In the past ten years **Asian countries** at the forefront of economic development have introduced centralised, conscious and systematic long-term government measures and strategies and as a result gradually created the high level conditions of ICT infrastructure. **In these countries the main goal is to reduce the second-level digital divide,** although the main means employed is still the development of physical infrastructure. The poorer countries of Asia have not yet reached the stage of the Internet revolution and their focus is still on the development of the infrastructural background and the proliferation of ICT tools. In these countries the majority of the population lives in dire poverty, so in their case e-

inclusion does not primarily mean the integration of disadvantaged groups into society but a general trend to provide people with computers and Internet access. **A noticeable trend in Asia is that programmes are aimed at children, educational institutions and those living in villages.** Despite the fact that in a large part of India there is only six hours of electricity a day and telephone landlines and drinking water is inadequate, the country sees its potential growth secured by building an information society. India will most likely be the first to prove that through ICT tools the information society is actually capable of creating opportunities for the integration of individuals and communities coming from a disadvantaged background.

**In Africa economic factors drastically determine the opportunities for basic networks, Internet penetration, ICT provision and usage.** The continent - which is at the greatest disadvantage and the poorest in the world in regard to unequal opportunities, where, according to World Bank data, there are areas where 71 percent of the population lives on less than \$1 income a day (Nigeria), where life expectancy is only 35 (Botswana), where the proportion of illiterate women is only 13 percent (Chad), and where half of the children under five are under-weight (Burundi) – is extremely behind in the area of ICT, too. Internet users in Africa constitute only a few percent of the population. The realisation in recent years of solutions and opportunities – through targeting a low-liquidity but enormous population with laissez-faire market tools – inherent in the 'poor economy' give some hope to the developing regions. For example, cheap and easy-to-use PCs, such as the Indian Simputer and the "100-dollar" XO laptop, as well as 15-30-dollar mobile telephones have been launched onto the market.

In contrast to the **one device per one user model** characteristic of the developed world, several users have shared one device in the developing countries from the very beginning, and are typically members of informal communities. Building a business around community access is based on two important principals: firstly, the total cost of ownership (TCO) in the case of mobile devices shared by several people should decrease per person, and secondly, the user should turn into a producer and service-provider, creating the sources of income not only for the use of the given mobile telephone but also for further consumption. Based on these principles Grameen Bank launched its Village Phone initiative in Bangladesh in 1997.

A good example for best practice is the *yumi konek* project in Vanuatu. Vanuatu is an island nation located in the South Pacific Ocean. The archipelago, which is of volcanic origin, is some 1,750 kilometres (1,090 mi) east of northern Australia, 500 kilometres (310 mi) northeast of New Caledonia, west of Fiji, and southeast of the Solomon Islands, near New Guinea. The *yumi konek* is a **rural connectivity project**, which aims to promote and facilitate equitable and sustainable rural development and peace building by enabling better information sharing and knowledge building among and across Vanuatu. The project will establish an email system based on a robust, proven and sustainable technology that permits remote locations on islands across thousands of square kilometres to have access to Internet emails using a simple computer, short-wave radio, and solar power, and *yumi konek* is now working with partners to develop applications of the network in many sectors.

### 3.1.1. Best practices in mobile technology

**SMS for Life** - Three companies, along with the Roll Back Malaria Partnership, are piloting a project called SMS for Life to use text messaging and Web sites to track and manage supplies of anti-malarial drugs. The program is running a five-month pilot in 135 villages in Tanzania, where healthcare staff receive automated text messages that prompt them to check remaining stock of anti-malarial drugs each week. Then, staff reply to a database in the UK with current stock levels via text messages sent through a toll-free number, so deliveries can be made before supplies run out. During the first few weeks of the program, the number of health clinics that ran out of drugs was reduced by as much as 75%.

**Life Tools** - Life Tools is a service tailored for farmers and rural communities living in remote areas, providing them with information specific to their livelihood and personal enrichment. The service was rolled out commercially in India on June 12, 2009, after a pilot trial in the state of Maharashtra. The project started in December 2008 with five focus districts getting promotional activities and eight non-focus districts without marketing. The Life Tools program in India focuses on Agriculture and Education services with Entertainment. Basic Agriculture service: priced at 30 rupees (US\$0.65) per month, this provides farmers with tips on agriculture techniques and news. Premium Agriculture service: costs twice as much, this offers the full suite of information including market prices, weather updates and news and tips. Education (Learn English): costs 30 rupees per month, this provides simple courses on English in the local language. The General Knowledge option (30 rupees) keeps users abreast of what's happening in the world daily. Entertainment: This provides users with regional news updates, astrological predictions (30 rupees), cricket news as well as ringtone download. The service relies on SMS technology, the content is delivered via the cellular network and works as long as there is GSM coverage. Nokia said it had plans to launch Life Tools in other Asian and African countries before the end of 2009.

**MSONE** - This is a very locally based SMS newsletter, with 160-character local news stories. It was started by Ravi Ghate, who proudly points out that none of his core team graduated from high school, much less attended an IIT or IIM. Ghate goes to a village and scouts out an unemployed young person - preferably one who's had jobs as a street vendor or has experience going door-to-door canvassing for local politicians. The young person pays Ghate 1,000 rupees (or about \$20) for the "franchise" rights to be the local reporter for that village. He goes door-to-door signing up 1,000 names, phone numbers and other basic information, then mails the slips to Ghate. Ghate enters it all in his databases and all those "subscribers" get a text introducing the young person as their village's reporter. In India all incoming texts are free so, the subscribers don't pay anything. The change in life is not only pretty huge for subscribers. That once-unemployed young person suddenly has important local standing in his community. In addition to writing 160-character local news stories, he also sells local ads. Like a newspaper, Ghate ensures a ratio of ads to stories, so the news doesn't get overrun by promotions.

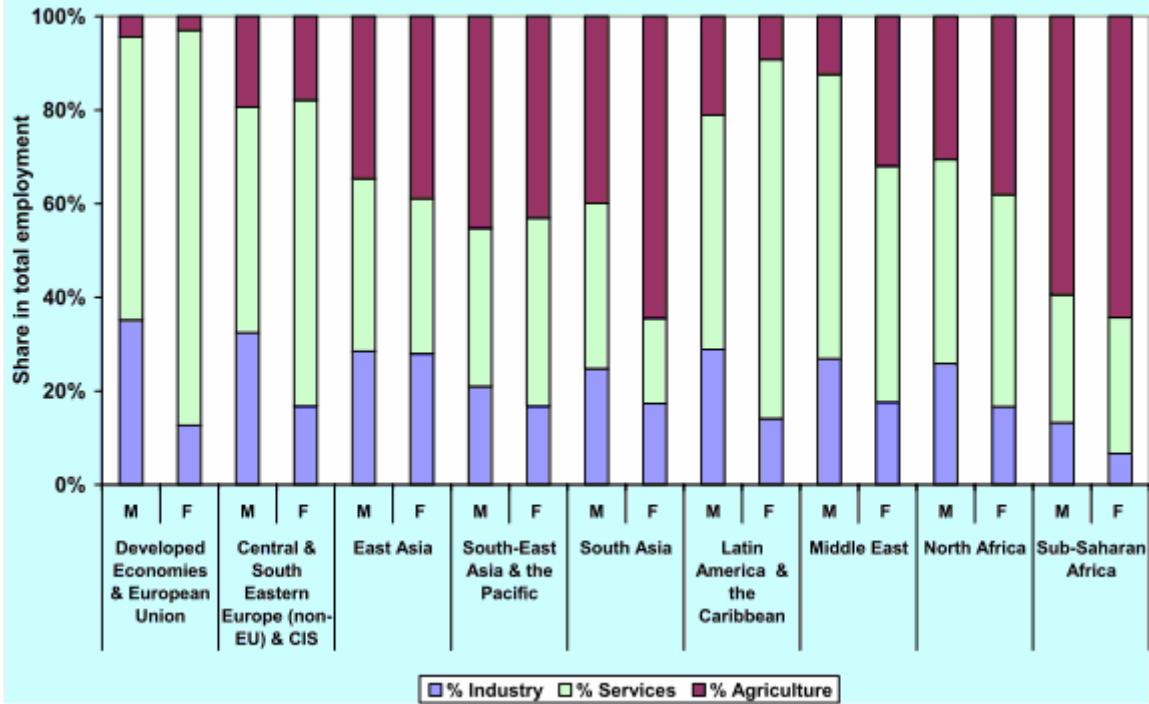
### ***3.2 Labour market***

**The information society holds the promise of radical improvement in the employment – and thus social status – of women.** Although the past century saw a number of revolutionary changes in regard to the social status of women worldwide, they vary significantly in regard to their advancement, acceptance and the depth of the changes they have generated in the various countries and cultural regions. **The ongoing changes and restructuring on the labour market will most definitely generate new, far-reaching cultural and social change.**

In 2008, at a global level, three billion people were employed, out of which 1.2 billion (40.4 percent) were women. The level of employment for women is on the increase worldwide, and data show the largest expansion in this area in Latin America, the Caribbean, the Middle East and North Africa. A decrease was only observable in East and South-East Asia; however, it is noteworthy that the level of employment among women in East Asia is already at a very high level and that the difference between sexes in the region is the smallest in the world. In parallel with the previous trend, the employment of men decreased in most regions of the world between 1998 and 2008.

In a sectoral breakdown, most women are employed in agriculture (35.4 percent globally, in contrast with 32.2 percent for men), with the worst work environment, generally speaking. On a global scale women work under worse conditions than men (lower salary and status, illegal employment more frequent). **The global economic crisis led to a decrease in employment mostly of men:** in 2008 the unemployment rate for men was 6.6 percent in the developed countries and the European Union, representing a 1.1-percent increase from 2007, while for women the data indicated an increase in the rate of unemployment of only 0.8 percent for the same period.

**Figure 2.: Distribution of employment by sector (sectoral employment as percentage of total employment), by sex and region 2008**

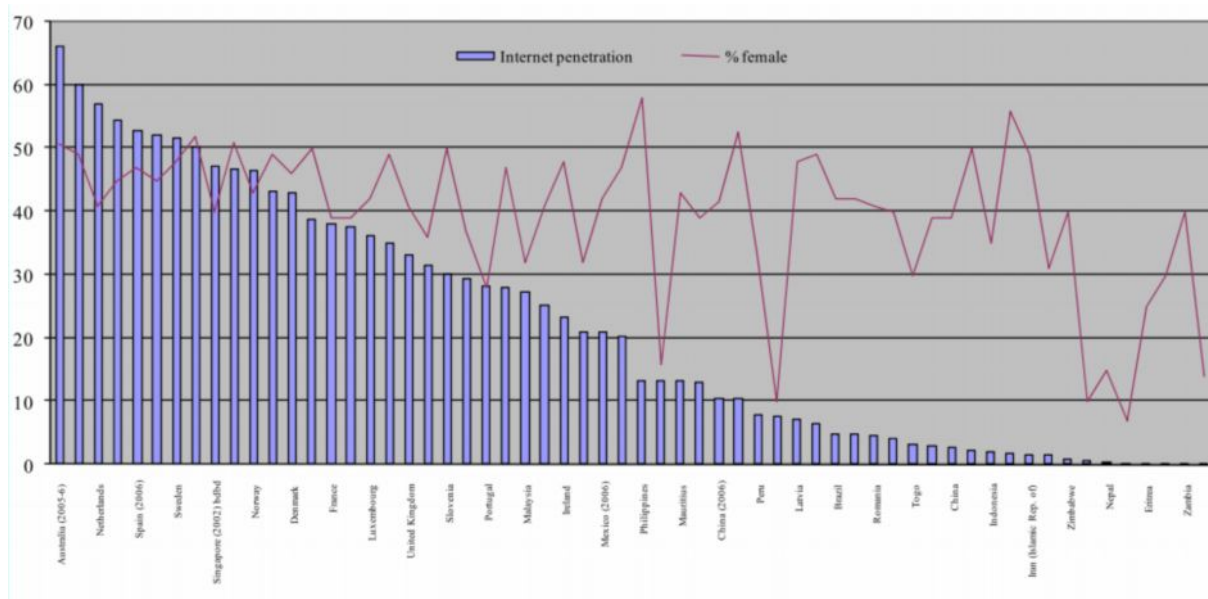


Source: ILO, Trends Econometric Models, January 2009

**The decrease in the proportion of men employment is caused by** retirement and the fact that for those with lower qualifications it is increasingly difficult to find work. **The picture is more complex in the case of women:** one the one hand, physical power is less and less of an expectation on the labour market, and on the other hand salaries are more attractive; thirdly, women are better able to influence the number of children they have; fourthly, a lot of women want to build their careers as a result of the large number of divorces; and last but not least, women are forced to increase their savings because of their higher life expectancy.

Unequal opportunity also exists for women in regard to access to ICT tools. **Globally speaking, the level of Internet penetration does not correlate with the proportion of female users,** because in a lot of countries women have no money to pay for subscription, or buy ICT tools, and men tend to enjoy a higher level of access even in developed countries. Thirdly, women are mainly employed/are present in the informal sector, and, fourthly, they are far more affected by illiteracy.

**Figure 3.: Internet penetration by national averages**



Source: from *Digital Divide to Digital Opportunity: Measuring the Information Society* ed. G. Sciadis 2005

The most interesting projects promoting the ICT opportunity of women are carried out in Asia. This is partly the case because, looking at it globally, the most dynamic increase in mobile telephony is seen in Asia, and a mobile telephone is the most affordable ICT device for the poorest people. On the other hand, mostly through offshore companies coming from the USA, masses of jobs are available – mainly for Indian women – in call centres, as well as positions requiring low ICT competence. However, many people in these jobs do not see their future prosperity in this line of work but rather in starting up their own businesses in which ICT tools represent the greatest help.

The 'Village Phone' programme supported by the Grameen foundation is a business model aimed at taking mobile telephony and the infrastructure necessary for its operation to areas where it would not otherwise be economically viable. The programme has thus far promoted mobile telephony with a commercial purpose for more than quarter of a million poor women living in villages in Bangladesh and Uganda.

Within the framework of the e-SEVA project rural web “e-SEVA centres” were set up in Andhra Pradesh State (where women represent the poorest social layer) for self-help groups of women. The project is aimed at promoting the economic emancipation of women and enabling the elimination of the flaws in the local government operation. The first centre was established in June 2002, and since then the number of centres has risen to more than 200, which mainly operate in small villages. Each centre has Internet access (through modems in the villages, through cables in cities), scanners, photocopiers, webcams, etc. The centre also provide various services, such as paying bills, issuing birth certificates, Internet searches, telemedicine, and tele-agricultural services, but users can also participate in online auctions or filing complaints. These centres are operated by women who take out loans and use the

revenue to pay it back. The large centres – after the bigger costs have been paid – produce an average of 320 dollars per month, while the small ones make approx. 90 dollars. According to statistics, the citizens can save 0.10 dollars on average thanks to these centres, as a result of which the savings on a district level amounts to well over US \$ 100,000/month (US \$ 1.4 million/year).

The E-Homemaker project in Malaysia was launched in 1998 with the aim of developing women's business competence. The portal is not only a platform with important information about a diverse range of topics - for example, how to make a business plan or meet registration requirements – but also contains useful tips about managing a household. The portal provides daily assistance for more than 10,000 women working full-time to be better able to deal with their double workload through self-help innovation.

Tele-health centres in Pakistan: one of the biggest problems in Pakistan is the shortage of doctors, since there are only 74 qualified doctors for every 100,000 people, and in rural areas this proportion is even lower. On average, a patient needs to see his or her doctor 22 times a year, which means enormous costs, especially for the poorest. This problem is addressed by tele-health centres, which are operated in a franchise system by women. The centres provide primary care services for those in need (mainly women and children) and offer consultation sessions through IP video telephones with specialists based in clinics at distant locations. The objective is to establish 500 tele-health centres by 2012 all across the country.

24

### ***3.3. Technological trends***

This chapter provides an **overview of** the most important and/or most interesting **developments of 2009**. We have collected innovations which (or the clones of which) will fundamentally have an impact on the culture and economy of the information society, and through that national policies. **We mainly focused on traditional IT areas**, and having taken a broad view of the world of technology, we must definitely highlight innovations connected to biology and medical science. For example, an operation executed in Great Britain restored – alas not to its original “quality” - the vision of a 42-year-old man, who had been blind for twelve years (pieces from the patient's tooth was used to attach a lens that was produced out of tissue removed from his facial skin); and another formerly blind British man is able to see again after 30 years thanks to a so-called bionic eye.

Among innovations of the Internet it is important to mention the launch of the **fifth version of HTML**. Another hot topic of the recent past is **3D browsing**. Endearingly amateur attempts were made even ten years ago to develop 3D browsing, however, either the interface did not resemble the space that was simulated, or, if it did, users had to wait minutes for the next image to be uploaded. But that is all in the past. Today the standard for accelerated 3D graphics on the web is being developed, and it seems that 3D walks will not



only be possible in online games but on social networking sites too: we will be able to walk to a friend with the help of our avatar and send a friend request. This technological innovation has important relevance for something that had a great impact in 2009: recently an American business announced that they had a 3D virtual solution for companies “affected” by HINI to ensure smooth operation (affected employees could participate in virtual meetings through their avatars).

The **games industry** still considers the merging of real and virtual worlds its own hottest trend. **In addition to continuously changing controllers, there are attempts at omitting them altogether.** The main aim of Project Natal, presented by Microsoft this year, is to create a game without controllers using touch, face- and voice recognition and movement sensors to enable players to control their characters with their own movements. The new development will make it possible for users to contribute to the game by digitalising their own, personal objects. Other novelties include the “magic wand” developed by Sony, and the Nintendo Wii vitality Sensor. The latter could possibly be used to battle sleep disorders. **The global economic crisis did not hit the games industry** as much as it did other sectors, and news came out in early 2009 that video games are beginning to pose a threat to the viewer numbers of prime time programmes running on television channels.

It is true not only of the games industry but of all IT that instead of being on the traditional peripheries we can come into an increasingly extreme “personal contact” with technology. In a significant percentage of developments the objective is to make virtually all kinds of surfaces – paper, empty wall surfaces or a palm – a suitable interface for browsing on the web. **The online and offline worlds** are increasingly merging in solutions such as SixthSense, for example; the Media Lab of the Massachusetts Institute of Technology (MIT) have developments useable with mobile telephones such as dialling on a keyboard projected onto the user’s palm, or airplane tickets that display (regularly updated) flight information.

Another possible successor of the traditional monitor is glasses: this year several applications were presented which **bring the projected image as close to the eye as possible.** One such development is the Tele Scouter glasses. Another is the device developed by NEC to be used for simultaneous interpretation which works in the following way: during the conversation the sound is transferred to a server via a microphone (then a wireless connection) from where it instantly arrives back and the translated text is projected onto the retina (only to its peripheral part of course, so as not to interfere with eye contact) by a display fitted onto glasses. A third example is the **intelligent glasses** developed in Austria which add extra information to what is seen in reality, for example, famous sights, purchased products or bike route planning.

Notably, **4G** is also coming within reach, which the development of the mobile video will most likely benefit from. **Augmented reality** – i.e. displaying information about the environment (famous sights, shops) with the help of mobile phones – is an especially important trend in mobile telephony.

**Touchscreen smartphones** continue their triumphant march forward – and iPhone is not the only product that should come to mind: although it was launched at the end of 2008, Blackberry Storm by RIM became a rival of iPhone in the USA. It has a special, new generation touchscreen on which (**virtual**) **buttons** can be pressed, as if there really were buttons there. The result is even faster browsing and even more accurate text input. It is also equipped with GPS, and the new version has Wi-Fi as well; images and videos can be shared instantly - even on the chat programme.

But the iPhone should not be left out of this overview either, since 2009 was also the year of launching applications that can be run on the world's most popular smartphone: in App Store, which offers the applications, more than a hundred thousand different programmes can be found; iPhone owners have already downloaded more than two billion (!) applications.

Finally, an indicative event of ICT convergence must be mentioned in the area of mobile telephony: Googlephone by HTC is about to be launched in the United States in the immediate future.

One of the most important trends in the world of technology in recent years has been the **forging ahead of green solutions**, making this area an especially exciting one. IT is not the only area of interest: for example, Honda FCX Clarity, a hydrogen fuel cell, perfectly quiet, practically zero- emission automobile, came out this year.

A **brilliant example of the convergence of IT and green solutions** was spread around the world by a new item announcing that in Helsinki flats will be heated by servers. An IT company moved its server park under a cathedral in Helsinki with the aim of joining its cooling system with the network of the local district heating provider, thus ensuring that the heat energy emitted by the computers is not wasted. The amount of heat generated by the servers will heat more than five hundred flats.

Apropos the technology of indoor environmental comfort, it must be noted that green thinking is beginning to enter areas such as **tourism**: it is becoming increasingly important for travellers when selecting a hotel, for example, if there is selective waste management in the facility, how often the towels are changed and if the hotel uses recycled products. Based on such criteria a hotel can be qualified as “green” – the number of which is on the increase and which are increasingly given preference in corporate bookings (and it is likely that it is not *only* the case because it looks good in the end of year report). Many public institutions have also started to encourage their employees to choose environmentally conscious hotels if they can. This trend is all the more important since a serious development of 2009-2010 is the number one eco-hotel of the present (future): the super green and super innovative Monterey Bay Eco Resort and residence is just being built.

Innovation is making an ever more visible impact on interiors. New technologies are being developed for **intelligent homes**, such as RFID and OSGi: an integrated solution enables remote switch-off of lights left on by mistake or the check-up of a home's security system. It can also be used to programme a favourite song which will then “follow” the flat owner

from room to room. Users can check through a monitor what is happening in the home, even on mobile devices.

Although it should not exactly be included on the list of new state-of-the-art technology, it is important to follow the new applications of already existing technologies. For example, **face-recognition software programmes** – developed by Hungarians – can be found in shopping centres. Software with the aim of specifying people's age and sex have been around for a long time, but systems such as those measuring shoppers' routes, the turnover of plazas and time spent by customers in front of shelves can be considered as novelties of recent times.

Similarly, research and development in the area of **virtual reality** have been common knowledge for a long time; however, the news about the successful use of the available technology in the battle against smoking: participants in an experiment stubbed out computer-simulated cigarettes, which helped some of them to actually give up smoking.

**Serious games** - experiments are being conducted to use video games to combat depression and anxiety (a research project carried out this year shows that the mood and heart rate of players are better than those of non-players), while in the Netherlands an online game was used to call attention to the importance of fighting the new type of influenza.

The following stars of the 2010 CES exhibition in Las Vegas provide a good insight into the future of technology: **Bluetooth ring** alerting users of mobile calls (ORB, Hybratech), a camera with an in-built projector (Nikon Coolpix, S100pj), an in-dash computing device with Internet connectivity, GPS and hands-free phone functionality (Ford Work Solutions), or the iPhone application and a connected device enabling the remote central lock control of a car. (An interesting aside – not closely related to our topic – is that another exhibition in Las Vegas, the AVN Adult Entertainment Expo, presented the world's first sex robot.)

The above sampler is a clear indication that 2010 will offer a number of exciting developments for the fans of **state-of-the-art technology**: “notbooks” of a traditional size but resembling netbooks and “smartbooks” smaller than netbooks will come out, while Apple will launch a tablet computer resembling the iPhone.

**Web connectivity will soon be standard in new televisions** (since the most recent TV productions are available online – not infrequently free of charge). Another trend in the television segment is 3D. Sony presumably will come out with its 3D product in 2010, while several manufacturers are working on developing a 3D television set that can be viewed without special specs – which are felt to be rather uncomfortable for many – necessary to “interpret” the 3D programmes.

Experts say that the coming years will bring great success to **e-readers**, which sold like hot cakes in 2009 (what is more, the first Braille e-book reader was made this year), but books with colour displays will soon be available too. It is being heralded that the hit products of 2010 will be the built-in mini projectors, i.e. projectors built into mobile telephones and

cameras able to **project images the size of a TV screen onto the wall** (and other surfaces).

### ***3.4 The importance of life - e-Health***

Information provision linked to intelligent, web-based health as well as the training and interactive lifestyle consultancy services have created a new industry: **e-health**. According to international estimates, e-based healthcare services significantly help to plan the healthcare of the future and the development of new tools by making healthcare provision systems more efficient and thus creating home and mobile health technologies. As a result, **eHealth is beginning to grow into a new industry in its own right**.

Government and/or market-sponsored projects range from the simplest online drugs databases through nanotechnology-based developments to countrywide patient records. E-health is an area where the (near) future might well bring major changes, such as inter-hospital cooperation or even the creation of a “shared e-health space” with interoperable communication between national systems.

ICT in healthcare is aimed at significantly improving the quality, efficiency and overall availability of healthcare for all citizens.

Europe is in the lead in the areas of applying regional health networks, primary care, electronic client monitoring and the promotion of health cards. All this has led to the emergence of the e-health industry which is viable enough to become the third largest industry after the pharmaceutical industry and the industry of medical instruments and imaging equipment. By 2010 the money spent on e-health is expected to come to five percent of the total health budget of the EU Member States.

The proportion of people aged over 65 is expected to double by 2050. More old people will need long-term medical care and help in order to lead a self-sufficient live. Furthermore, there is an increasing trend in chronic diseases and the related costs.

Traditional healthcare institutions provide care based on the symptoms of diseases, which makes the system expensive and decreases the quality of life of patients. Although the advantages of preventive healthcare are broadly known and recognised, only a fragment of the current health budgets in OECD countries is spent on prevention. Moreover, most of the health services are provided in healthcare institutions, which is extremely wasteful since a significant number of active beds are occupied by chronic patients. This raises the question of efficient remote monitoring and care.

**Two key approaches** can be distinguished in the area of healthcare provision: one supports the transition from symptom-based to preventive healthcare, and the other advocates a switch-over from hospital-centred healthcare to a citizen-centred health delivery

system. These objectives are facilitated for example by the attempts at accelerating the process of accessing medical information, which means that citizens should be enabled to participate in the maintenance of their own health, the prevention and early diagnosis of diseases should be improved, chronic diseases should be treated cost-effectively, and active old age and an independent, self-sufficient lifestyle should be made possible for the elderly. In other words, ICTs could make healthcare more indirect. The real-time information provision, training and monitoring of patients would be implemented, which would significantly improve quality of life and play an important role in promoting healthy lifestyle programmes. A personalised, complex, preventive, non-profit health-retention and -maintenance programme can be developed, which would include a wide range of services such as web-based information provision, a complex system of filling in questionnaires, interactive lifestyle consultancy and personalised dietetic services.

**The virtual man project** offers a viable perspective for the development of efficient medicine in the future. A branch of biomedical informatics integrates different levels of health data (molecular, cellular, tissue-level, organ-level, individual and pertaining to the population), and does this with great efficiency by employing computer technology methods such as data mining, modelling, simulation and visualisation, making the forecasting and more accurate diagnosing of diseases more efficient.

The concept of **personalised health systems** has been developed to prevent and manage diseases. They may be implemented in a number of ways, such as worn on the body, in the form of implants, or as portable systems. They would enable citizens to take an active part in the maintenance of their own health and help them gain information in connection with their medical condition. With the help of such systems the continuous remote monitoring and retaining of individuals' conditions is made possible and chronic diseases can be managed from a distance. Personalised health systems may greatly contribute to an active old age and an independent lifestyle.

## 4. e-Government

### 4.1 The impact of the economic situation

A noteworthy effect of last year's global financial and **economic crisis** is that fundamental issues determining **the relationship between the economy and politics** – and indirectly between state and society – **have come into the focus of attention**. Key issues include who should have control over the money markets, what kind of control they should have and on whose behalf they should act, via what portals and interfaces do the “private” and the “community” sectors interact, how can the risks be distributed more fairly, and how transparent are the various processes? The intellectual and mental renewal that is happening now requires a switch-over in the near future from the concept of the *state as service-provider* to *isocratic governance*, i.e. a new government model based on equality and reciprocity, the right of clients to act and make decisions and their being regarded on an equivalent basis.

The standard and efficiency of public administration and public services unquestionably have a **direct and strong impact on the performance of the real economy**; thus, developments continue to focus on various areas of e-government. Thirty percent of the world's financial expenditure comes from the government sector, which means that even a few percentage-point improvement in the efficiency of the administration generates considerable savings at macro level. At the same time, a significant amount can be saved annually on the user side too via online services. New development trends must clearly be aimed at **decreasing administrative costs and increasing efficiency, transparency, and accountability** and user satisfaction.

In contrast to the commonly held belief that e-government is synonymous only with electronisation, i.e. computer and software usage, in actual practice e-government rather means a switch over to a new culture, i.e. an overall and radical transformation through an entire range of electronic solutions introduced into public organisations with the aim of improving the availability, quality and transparency of their services while reducing the costs as much as possible.

Despite e-government being a relatively new area, the past decade witnessed dynamic changes. The electronisation of public administration was initially only about the proliferation of computer and Internet usage, while electronic administration today means the overall modernisation and simplification of administrative work and back-office processes as well as making front office services cheaper, more convenient and transparent. In the early days the main question was the extent to which modern ICT tools could be used in public administration, but today it is much rather how ICT usage can best promote the development of an inclusive – i.e. highly integrated – Information Society.

In the past year, exciting e-government contents and services were launched in developed and developing countries alike. All of these developments point in the direction of decentralisation, i.e. they do not offer the services customarily offered on e-government

portals but instead are found on the websites of other government and local government institutions. The buzz words in regard to services continue to be customisability and the interoperability of systems, while in the area of services offered to companies there is a visible trend to combat (excessive) administration.

## 4.2 Breakthrough to open source software

In recent years OSS solutions in e-government have continuously been forging ahead; however, an important change is that the open source code is increasingly becoming an expectation coming from “higher levels”. **Open source initiatives have already been present at PR level, but the intention to switchover is now evident even in strategic documents** (e.g. in France, Great Britain, Spain, Norway, the Netherlands, Brazil, South Africa and China) and plans are increasingly being implemented. Migration is picking up speed too: depending on the temperament and enthusiasm of those involved, it affects entire cities (i.e. all of its public institutions) or “only” certain offices. Furthermore, OS competence centres are opening one after the other worldwide (e.g. in Great Britain, Norway, Slovenia, the Netherlands), and of course in places that switch over to the new platform the retraining programmes of public servants to use OSS are in full swing.

**Open source software** is an increasingly accepted and important element of government and business IT models but the real breakthrough is likely to take place as green, environment-friendly IT trends become more pronounced. For ideological reasons and their efficiency, sustainable development and OSS exert a mutually productive influence on each other. In addition to environment-friendly informatics these software programmes are expected to be the generators of a software breakthrough in e-health, primarily because of their **interoperability**.

## 4.3 Green e-government

One of the most noticeable trends is the **strengthening of “greenness”** in e-government developments. As in all areas of IT (and other technologies), the application of environmentally conscious solutions compatible with the idea of sustainable development, as well as the need for such, have perceptibly increased. Content provision connected to environmental consciousness has undergone major development: web pages connected to carbon dioxide emission and pollution have been launched by the competent authorities in a lot of countries. Numerous databases and portals monitor the state of and the changes in the air, water, earth, waste, sound and nature, but data can also be found about the trade in greenhouse gas quotas, and some sites have climate change simulators. The EU published a White Paper on the theme, announcing a concrete action plan in order to increase adaptability to the effects of climate change.

Extensive IT systems are used in the public sector too, ranging from various databases to providing the necessary infrastructural background to public servants; however, the solutions employed by the state also significantly contribute to the promotion and dissemination of good practices.

Public institutions in the USA have increasingly followed corporate trends in recent years: using energy-saving tools, server virtualisation and thin clients are all becoming part of the everyday way of thinking. Green IT initiatives are found in one third of public sphere organisations. The United Kingdom went one step further: in the middle of 2008 the British Cabinet Office published *Greening Government ICT*, setting the government's objectives to use more efficient and environmentally friendly informatics. The stated objective of the document was that in four years' time the operation of government ICT systems must become *carbon neutral* and non-hazardous to the environment. The long-term goal is even more ambitious: by 2020 central government information systems must be carbon neutral in regard to their entire lifecycle. This is all the more important because ICT tools are responsible for 20 percent of the total emission of government offices, i.e. eliminating this element of hazardous emissions would significantly reduce total emission. It is also expected of government offices that from January 2009 the rate of greenhouse gas emission in relation to the products or services to be procured must be a priority in their public procurement projects.

#### **4.4 E-voting pushed into the background**

Belgium was the first country in Europe to use e-voting, while the first major project was implemented in Great Britain. Electronic voting has two forms: one of these allows the voting public to vote through the Internet, while in the second type it is done by using a voting machine. One of the achievements of recent years was the smooth application of e-voting in an election in Estonia, in which the electorate had the option of casting their votes through the World Wide Web. Three percent of the electorate, or precisely 30,243 citizens, took advantage of the opportunity.

However, **there are increasing concerns being voiced about e-voting**. For example, one of the most authoritative institutions, the United States Government Audit Office, supported e-voting in the past, but this year has called attention to the security risks involved, emphasising that e-voting and the proliferation of IT systems that make it possible carry within them inherent dangers and it is not likely to be the foundation of revolutionary innovations that will solve all of the present problems.



## 4.5 Blog democracy

The objective of e-government is not exclusively to facilitate enhanced efficiency in public administrative services since the transparency of decisions and the consolidation of **citizens' participation** are just as important. Quicker and cheaper communication provides citizens with increased opportunities to monitor their elected representatives and state administration. In the strategic documents of the European Union and Hungary the term 'e-democracy' is used infrequently. The objectives associated with this concept as well as challenges and solutions have more usually only appeared together with e-government, e-inclusion and e-participation. On the one hand, e-democracy can represent an increase in the transparency of the state and state administration, the inclusion of citizens through new technologies into the preliminary phases of decision-making processes and the decision-making itself. On the other hand, **e-democracy is understood as voluntary, online organisation of citizens**, as well as their online debates and political discussions.

By international comparison it is also discernable that considering the opportunities available peoples' political activity online has not increased. Yet, looking at the raw indicators for Internet use demonstrates that users are active, the number of blogs on the Web doubles every six months, and close to two million entries are made into Wikipedia per day, while more than 100 million downloads are registered. From all of this it seems logical that Web 2.0 will be used to provide a new boost to the development of e-democracy. Experts recommend including tried and tested solutions (e.g. community portals, video-sharing sites) as well as already popular sites. One result of this approach for example is the appearance of the European Council on YouTube (<http://www.youtube.com/eutube>): there are several dozen clips on its subsites in three languages, and the most popular of them draw audiences in the millions.

The significance of blogs is also increasing in the world of politics. In the United States 40 percent of adults read blogs with a political basis, and over a quarter of the adult population do this several times per month. Close to 50 million Americans can be directly reached through blogs, thus it is already inconceivable that a political campaign could be conducted without the use of online instruments. Although there is no exact data on the results this achieves, blogs are also part of political campaigns in Europe: in the French political elections of 2007 the campaign webpage and political blog already played an important part.

## 5. Information Society breakthroughs

### 5.1 Social networking

**Networks have become one of the most fundamental elements of human civilisation:** everyday life without modern road-, public utility- and communication networks is unimaginable. The use of Internet technologies and applications has been adopted on mass to such a degree that they have come to be regarded as essential elements of social networks and communities.

The World Wide Web appeared in the early nineties, while commercial use of the Internet and the www became possible from 1994. These days an increasing range of software – starting from e-mails, going on through forums, blogs and wikis to social networking sites are available – allows people to express their opinions, broadcast themselves and to cooperate with others on given matters, solve problems and obtain information.

**2009 was without doubt the year of websites facilitating social networking.** In January of 2009 there were still just 150 million users of social networking sites, but within one year this figure has doubled and so now throughout the world some 350-400 million people log on at least once a month to such websites. Thus, social networking media has now become one of the most fashionable themes of the information society, under which we mean those presently popular social networking sites such as MySpace, Twitter, Facebook, YouTube, and Flickr.

The number of visitors to social networks and portals **has never before increased at such a pace as in the present period of economic crisis.** Moreover, this increase was the most dynamic in the over 40 age group. In the United States close to 56 million people use social networking sites. For example, Twitter provides information on the post-election situation in Iran (it has even emerged that Twitter might be awarded the Nobel Prize for this), but mention could also be made here of sporting events: e.g. the old stalwart of the Tour de France, Lance Armstrong put up a post on Twitter to his team mate who finally became the overall winner of the race.

Considering the statistical data, these sites are the gravitational points of the Internet at present. According to comScore's data, **the number of the social network users in the world exceeded the 730 million** mark in May 2009. Facebook has 250 million active users – with over ten billion photos uploaded – while some 320 million visits are made to its portal every month.

A very important change that took place in 2009 was that **the older age groups also discovered the advantages of social networking sites:** on Facebook the greatest increase has been in the 35-49 age group, while almost twice as many new users in the 50-64 age group have been recruited than among the under-18s.

Can Facebooking, Tweeting and posts of up to 140 characters really bring about any social cohesion, new behavioural patterns and a culture of their own? There is no doubt that Twitter will have an effect on language just as telegrams and text messages have had/are exerting an enormous influence on making words more compact and shorter, but could new behaviours and communities develop?

The **main advantage** of Facebook and Twitter **is the creation of networks** of acquaintances, and information, feelings, news and gossip are circulated on these networks just like in a small village community, claim those stressing the positive effects of social networking media. It is certainly the case that useful information and breaking news can be obtained on the network, similarly to a mailing list.

The new applications of social networking sites that have been launched in recent months make them increasingly suitable for the organisation of groups around shared interests. This enables people to access **targeted news sources** as if they were using a search engine, so it might happen that for increasing number of networking citizens online social networks will be the primary source of obtaining information and news.

Facebook's position was further consolidated when at the end of 2009 it became the third most popular video sharing site in the world. Coming in third to YouTube and Hulu, Facebook has some 217 million video uploads, and this can be regarded as a considerable leap since in September 2009 it was ranked as the tenth in popularity.

It is quite amazing but social networking sites in 2009 not only made headway in **video sharing** but also in the **area of games**: in the past year the number of users playing games on social networking sites increased tenfold. Farmville, the most popular game on Facebook, can boast of 62 million players per month, and besides this 12 Facebook and 4 MySpace games each have over ten million players per month, and these numbers have continued to rise significantly since November 2009.

Of course all of this data has attracted the attention of the business world. Research was carried out among the Fortune 100 companies in the first two weeks of 2009: do big corporations use social networking media channels on the companies' respective portals? The findings were surprising: 54 percent of companies use Twitter, 32 use Blog, while 29 percent use Facebook (its fan sites). Naturally, it is the technology and communications companies that are the most active in this respect: they use these sites mainly to publish recent news concerning the company, message boards, and advertisements for new services and recruiting new staff.

Of course a consequence of all this is that the amount of time spent on social networking media has also increased. Between April 2008 and April 2009 the number of minutes spent per month on Facebook and Twitter increased several hundred fold. According to researchers with time on their hands, in April 2009 Facebook users devoted close to 14 billion minutes to cultivating their social lives through this site, which, if divided by the number of active users, does not yield such a high number: it barely reaches an hour per

month per user on average, which almost certainly is inclusive of uploading and looking at photos and videos, as well as sprucing up profiles, etc.

This of course means something different at a national or company level. For example, in India – where Orkut, Facebook and MySpace have enjoyed great popularity – it is thought that **social networking sites significantly damage workers' efficiency**, since they spend 12 percent of their time at work on such sites. Mention must also be made of the concern regarding the handling of personal information, and the conscious protection of such data. According to a survey carried out by an Australian security software firm (Sophos), people tend to thoughtlessly give out their personal data: in an experiment made on Facebook it transpired that users disseminate almost any kind of information about themselves to individuals they believe to be acquaintances.

The researchers also demonstrated that the use of social networking sites can be clearly divided into “life cycles”. New users enthusiastically seek out sites, and post friend requests and look at an average of 700-800 pages in one month. However, after some time this enthusiasm diminishes, and old users prefer to wait to be contacted. In the final stage it is merely the services available and the site's functionality that users express an interest in until the point when another site that weaves a better, more preferable social network appears, to which the majority of users move.

### 5.1.1 Do online networks alienate or unite people?

At the very outset it could be seen that these technologies would primarily foster opportunities for communication and the building of connections between people. The first social network was Classmates.com launched in the USA in 1995. Ten years on, in 2005, there were some 100 million people in the United States participating as members of some kind of online community.

The content and popularity of social networking sites allow the assumption to be made that the headway made by social networking technologies will have a **fundamental impact** on the system of interpersonal relationships and a tendency towards socialisation, but the question is whether this influence is heading in a favourable or unfavourable direction. Is this a new technology which is taking over the mantle from television to break down human relationships, isolate the individual and weaken the role of small communities to mediate and control norms? This is a question raised ever more frequently in sociological literature.

Numerous social researchers believe that the proliferation of the Internet and mobile telephones will further chip away at the fundamentals of the community and relationships between family, other relatives and friends, making human relationships superficial; thus, the vision of the Internet uniting millions of lonely users is hugely popular. One of the dangers they see in the development of modern societies is that it is **increasingly organisations based on impersonal relationships** – for example those mediated by institutions, organisations and communications technologies – that are forging ahead, while in tandem with this the role of the traditional community that passes on and maintains social norms directly is decreasing.

In the wake of the Internet's damaging course research findings were revealed at the turn of the millennium – the majority of them in the United States – according to which **the Internet was continuing to isolate its users and tearing them away from their social networks** since while using it they had less contact with family members, their friends and the community. It was to no avail that email was a convenient way of building and maintaining relationships between people if it could not provide the atmosphere of coming together over a coffee or a beer, i.e. the Internet could be the last, isolating technology that deals the death blow to a community already weakened by the car and the television. Through this technology people can already travel alone, work alone, and be entertained alone, thus use of the Internet can (also) lead to people losing the relationships they maintain with friends and family members – for example by not visiting them so frequently – and this effect is all the stronger upon those who had numerous social ties.

Experts – mainly psychologists – claim that **Internet usage might slowly create an irresponsible and fragmented society**. It is an interesting point that it is also mainly psychologists who are warning of the dangers and cautioning young people about the use of the Internet and mobiles, since such young people are increasingly becoming addicted to the gadgets of this technology instead of establishing personal contacts.

Pessimistic researchers believe that if new relationships are established online, most of them will merely be “weak relationships”, since emailing is a “lower level” communication in comparison with a telephone conversation or a personal meeting. American researchers believe that the negative effects of information technology are increased through anonymity and strengthening individualism, thus weakening societal norms and trust while destroying social capital. An accelerated world of social networks does not allow enough time for the mind to comprehend such emotions as sympathy and admiration – essential in the development of people's moral sensitivity – thus the new media increases indifference.

However, **the conviction appears stronger** that modern networking technology has definitively become integrated into our everyday life and culture; thus, our social connections and social networks are not withering away but rather continue as a new quality and in a new form.

Many people believe - perhaps with justification – **that users of sites that allow the exchange of photos and videos do not constitute a community in the strictest sense of the word**, thus they cannot be called online or virtual communities since the forces and norms that build a community are weaker here. However, it must be noted that for young people the sharing of funny clips, cartoon characters or songs with their friends and acquaintances carries along with it the power to form identity, fosters interest and thus attracts people into communication groups.

All over the world numerous sociological research projects have focussed on the relationships between Internet users; and **the majority of them have established that using the Web does not weaken offline relationships but rather complements them**. Internet use has positive effects upon real life relationships because it offers new

forms of contact that significantly add zest to human relations and by removing the boundaries of time and space helps to form and strengthen new social groups. Moreover, it is possible to convey the same feelings and sentiments through online relationships as it is in face-to-face communication, and the World Wide Web is opening up ever more opportunities for human contacts which do not represent a different reality since during online interaction people take their gender, age, habits, culture and social-economic standing with them just as they do in offline relationships. This is precisely why virtual social networks must also be regarded as real, i.e. the Internet has become the biggest and most connected social network.

### 5.1.2 Cultural revolution

These days 'www' could stand for World Wide Words, or **World Wide Social**, since e-mail, the various messaging software and web diaries have been the most successful tools ever in bringing people together in the creation of an online community. In the early nineties a new expression, "social software", appeared which has now acquired its true meaning. The concept is used for the group of software programmes – e.g. instant messages, Skype, forums, e-mailing lists, blogs – which provide the opportunity for individuals to behave in a cooperative way, facilitates the formation of communities, self-organisation and self-expression as well as social interaction and feedback. All of this is carried out in a horizontal structure without an institutional framework, sub- and superordination and control. This is all a kind of new cultural revolution: technology is ever more easy to use and man eventually enters the limelight, increasingly translating itself, its communities and society into an online world, which is thus becoming ever more integrated into everyday life.

38

### 5.2 The world of free software

The development of free software and the extent to which it has **become widespread** is significantly influenced by the way computer science is being used, since this is constantly changing. The typical path of development was made up mainly by personal computers and the software serving them. As a result, it was the different versions of free software that were developed, and **this tendency continued all the way up to 2009**. A sign of how much these developments have matured over the years can be seen from the following: in 2009 the aspects of practicability and usability were attributed greater importance. Instead of the professional users of informatics, it was now the average user who was at the centre of attention. This was especially true in the case of Ubuntu, the leading distributor.

**Because of the global economic crisis, the fact that it had become possible to save considerable amounts with the help of free software became more and more important.** For this reason, companies dealing with free software are able to adapt more easily to the increasingly difficult circumstances. Analysts predict that the revenues of companies dealing with the proliferation of commercial Linux distributions (for example Red Hat, or Novell) will increase continuously. This means that from 567 million dollars in 2008 (which in itself is a growth of 23 percent in an economically difficult year), the sum will rise to one billion by 2012, and 1.2 billion dollars by 2013. This is the first time that open systems have appeared as real alternatives in corporate systems such as resource planning and

customer relationship management. The reason for this is evident: the lack of the usual software licence costs, and the **lower total cost of ownership** (TCO). Technical experts of companies no longer have an aversion to open systems, and no longer have problems with having to work in a mixed environment (for example Microsoft and open source systems).

Hoping to be able to save money, governments have begun to introduce the use of free software in more and more areas of public administration. As one French police official explained, it was by replacing Microsoft products with Ubuntu and Open Office for the entire police force that they were able to radically reduce the organisation's budget for computer technology and at the same time ensure continuous operation. Owing to the United States' decisive role (in world politics), it was extremely important that the new American government openly expressed its support for open systems. However, reducing costs was only part of the motivation. At least as important was the fact that with the help of open standards, government data became accessible to citizens and their organisations, which in turn made the functioning of public administration more transparent and controllable. In the United States and the other Anglo-Saxon countries, the most basic, decisive theme of 2009 was improving the way democracy works and involving citizens with the help of open systems.

As opposed to the normal trend of development, **three major novelties** have appeared, and it seems that a new paradigm is emerging, which may well destabilize the "normal" culture of computer technology, based on the use of desktop computers (Intel/Microsoft monoculture). One of the great novelties is the explosion in the use of light, portable computers known as netbooks. The other is the transformation of mobile phones and the appearance of a new generation of so-called smart phones. Both of these are extremely important from the point of view of developing nations, since they hold the promise of making computer technology more easily accessible, at a significantly lower cost, to a much wider circle of users, thereby making it possible to decrease the digital divide. The so-called tablets appeared in larger numbers and thus gained greater importance towards the end of the year. Although the significance of this phenomenon is mainly due to Apple's probable announcement, several other producers have signalled the appearance of similar computers. These also belong to the group of light, mobile, non-traditional devices. The third important development is that the role of traditional desktop operational systems has decreased, and that users have "moved" the software and data that they use to the Internet. Or, as they tend to call it, to cloud computing. All that is needed is a search engine and a basic operating system. All the other important tools necessary for work are accessible via the Internet. As a consequence of these intertwining new phenomena and the destabilisation of the status quo, there are many advantageous possibilities for the further proliferation of free software and the positions of legacy systems will also become weaker.

### 5.2.1 Netbooks

An extremely important development of 2009 was the **rapid increase of netbook users**. As is well known, although Asus played a key role in the actual appearance of the netbook category, inspiration originated from the OLPC project (One Laptop Per Child Association), the aim of which is to foster education in developing countries by obtaining cheap and accessible computers. At first, the majority of netbooks were delivered with various Linux distributions, but (mainly) owing to the lack of games, Microsoft's products soon became the most important players on this market, too. At the same time, the number of netbooks sold has risen sky high, and this is largely due to the fact that, as a result of the global economic crisis, the demand for cheaper devices has increased considerably. In the second half of 2009, plans for new netbooks that would use, for example, low power consumption ARM's processors instead of Intel's, appeared one after the other. On the one hand, 2009 brought the decline of free software in this important area, but since Microsoft's software does not run on these alternative devices, producers are turning towards the various Linux distributions. Besides the so-called traditional distributions, the role of Moblin is gaining in importance. Originally, Moblin was created by Intel, but all kinds of versions are appearing based on leading distributions such as Ubuntu and SUSE. There are operation systems that are optimised for the special characteristics (such as smaller screens) of netbooks. The other great opportunity that is sure to interest many people is the adaptation to netbooks, and especially to tablets, of the open-sourced Android, developed by Google as the operation system of smart phones.

### 5.2.2 Mobile phones and smart phones

What characterised 2009, beside netbooks, was the **development of mobile telephony and its meeting with computer technology**. Clearly, **open systems** have advanced in this area. As a consequence of the rapid evolution of mobile phones, the so-called smart phones are capable of taking over several of the functions of a computer. Their most famous representative is Apple's iPhone, but owing to its high price, it won't play such a significant role globally. Up till now, it was undoubtedly Nokia that played the leading role. The new version of Nokia's operation system, Symbian, which is completely open-sourced, was introduced at the end of the year. Google's Android, which also has open-source software, will be its greatest rival, and 2009 was its first complete year. Several manufacturers started using it for their own phones, but the most important event took place at the end of the year, when Google announced that they would distribute a phone that they had designed, the Nexus One, which would, naturally, use Android as its operation system. In line with this, Samsung also announced that it would design its own operation system for its phones, based on the Linux kernel.

The economic value of open-source software lies primarily in the eco system built on them, which is the weapon with which the great manufacturers fight each other. Open source, free experimentation and freely available development tools offer the opportunity for the emergence of a **new community of innovators** who will create a whole range of application software, which adds real value to hardware for users.



### ***5.3 Green IT – towards a sustainable information society***

The expansion of the information society and its set of instruments cannot be treated separately from the ongoing general discourse (which has perhaps become more pronounced in 2009) according to which – as a result of the currently dominant logic underlying the organisation of society and the economy – humanity’s resource management, and especially that of the developed countries, has surpassed the Earth’s ecological capacity. The most pertinent manifestation of this can be seen in the way the subject of **global warming** (concerning which there is now scientific agreement) has entered our everyday lives, only to develop into the communication of the climate summit held in Copenhagen at the end of the year, the result of which was hard to define.

The ever-growing expectations of society and the scarcity of resources in the spreading and use of ICT tools have pointed to new directions. Global economic recession gave **green computing** a new impetus in 2009, since, compared to earlier practice, it required a much more efficient use of resources in the case of companies.

The **direct and indirect effects of ICT tools** on the environment are increasing. As seen earlier, the number of working computers in the world is well over one billion, and the number of mobile phones is three or four times as many. Technological development in this area is so rapid that the life-span of an average company PC is only two years. Devices quickly become obsolete and the **amount of electronic waste** (which, although at a decreasing rate, may still contain toxic materials, and is disassembled in developing countries, under unsuitable conditions) is significant. **Energy use** is even more significant than the use of materials – according to certain estimates, 1.5-2 years ago, carbon-dioxide emission deriving from the energy needs and consumption of the infrastructure necessary for operating the Internet was already equal to the CO<sub>2</sub> emissions of air traffic, which is considered to be a serious source of pollution. As broadband becomes ever more widespread, **the demand for services** (requiring more and larger data centres) **and infrastructure has increased even more** (although a favourable trend has started with the increasing number of passive optical networks).

Besides the unambiguous, indirect effects (which may be positive or negative; it should be remembered that technology in itself is neither good nor bad but it is the way it is used that defines it) of these devices, their effect(s) on our everyday lives and the way we organise it is perhaps even more important. **New consumer patterns** have appeared, which in certain cases mean methods that are a lot more energy-saving and thus thought to be more sustainable: however, these are far from being widespread. Examples include the expected **paperless office**, the reduction in travel because of teleconferencing, or other effects that have been pending for years, in some cases decades, which have not been realised to this day, or at least not the way it was optimistically hoped for at first. And yet, it is becoming evident that the use of computer technology in other areas and industries may indirectly lead to significant results. However, in order to realise the positive effects – in our case: saving money, energy efficiency or the reduction of harmful emissions – mass distribution,

planning and, last but not least, the measurement and monitoring of effects are necessary if expectations are to be realised.

For the moment, **2009 - the year of green IT**, is defined not by the above, but rather by “low hanging fruits” , in other words, the management of direct (and easily adaptable) effects: due to economic pressure, companies and governments have introduced material- and energy-efficient measures (the most popular ones being a reduction in the consumption of data centres, virtualisation, cloud computing, reducing the demand for energy of clients’ computers, and increasing the life-cycle of assets). Thus, in the first round, it was the existing energies that moved in the “green” direction, but these were only the first and easiest steps.

Meanwhile, more and more research is being carried out and increasing numbers of studies have been published according to which real savings can be realised in industries which do not yet have informatics support, such as intelligent electronic networks (smart grid), logistics and primarily making road transportation more effective, while controlling the energy consumption of buildings, which is one of the most important factors of energy use, can be done much more efficiently with the help of various sensors and “smart” solutions.

Instead of listing further examples, one important factor where computer technology devices may play a significant role could be mentioned: **increasing awareness**, or making actual consumption visible and measurable in the course of monitoring. Information technology may play a role in “dematerialising”, analysing and transforming processes, as well as in sharing knowledge.

Both direct and indirect effects must become everyday practices and a part of strategic management, whether they concern a company, a government or a country. Exploiting possibilities must go beyond remediation/minimisation. It must not be forgotten that the tasks that this entails are different for developing and developed countries. For the time being, Green IT can only be interpreted in the **developed countries**, but we must make sure that the positive effects (good practices) of these segments of information society reach the **developing countries** in the near future, and the negative effects (primarily the above mentioned electronic waste, which causes problems even today) are eliminated as soon as possible.

## 6. ICT Uptake: Overview

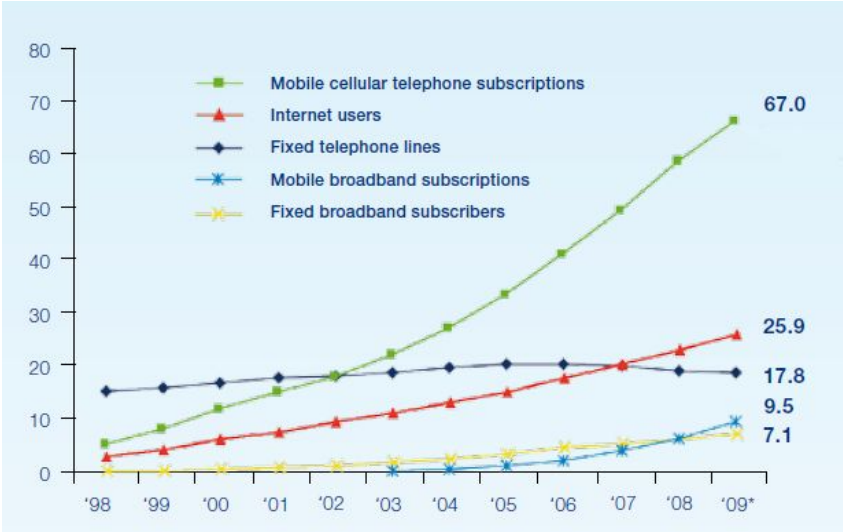
The proliferation of information technology in the world in 2009 did not display much that was new, though some trends that had already come into play became more consolidated. **While the number of Internet users worldwide is now closer to the 2 billion mark than to 1 billion**, there is still a significant divide separating the developing and developed countries, the only exception to this perhaps being mobile telephony. **Half of the world's population now have mobile telephones** with which they can send and receive text messages. In the meantime, the number of landline telephones is decreasing: in places where no infrastructure is built already, telephone lines are not being set up, and in other places they are losing ground to other services. While in the most developed countries practically the whole adult population use mobiles and the Internet at affordable prices, in developing countries the infrastructural background and the prices still represent a problem. New, wireless data transmission technologies might be a solution to these problems, although, for the time being, such wireless networks are only being built in the most developed countries.

According to the latest IT data, **basic information and communications technologies (ICTs)** – with the exception of landline telephones – **have continued to spread**, albeit with varying dynamics. Estimates put the number of mobile subscriptions at 4.6 billion at the end of 2009, which means that the mobile phone might well be the most used ICT tool with the most rapid penetration in human history. If the mobile subscription figure is projected onto the total population of the world, it means that out of every 100 people 67 – one third of humanity – have some kind of mobile telephone.

Similar data was reported in mid-2009 by the European Information Technology Observatory: according to their estimate, **the number of mobile subscriptions stood at 4.4 billion at the end of 2009**. While in Europe, North America and some Far Eastern countries the spread of mobiles has almost reached saturation point – i.e. the overwhelming majority of people already have one – thus far the highest level of growth can be observed in newly industrialised and developing countries. For example, in India there was an increase in mobile subscriptions of 30 percent in 2009, in Brazil it was 14, and in China 12 percent. For the sake of comparison, it is worth noting that at present 4.9 billion inhabitants live in a household with a television.

Fundamentally there are **two decisive reasons** why mobiles have overtaken landline telephones in developing countries. Firstly, building the infrastructure necessary for mobile services is far quicker and easier than in the case of traditional telephone networks. Secondly, the liberalisation of the landline market, often dominated by monopolies, began much later than elsewhere in the world, while mobile networks were open to new services from the very outset.

**Figure 4.: Number of internet users, mobile cellular telephone subscriptions, fixed telephone lines – trend analysis**



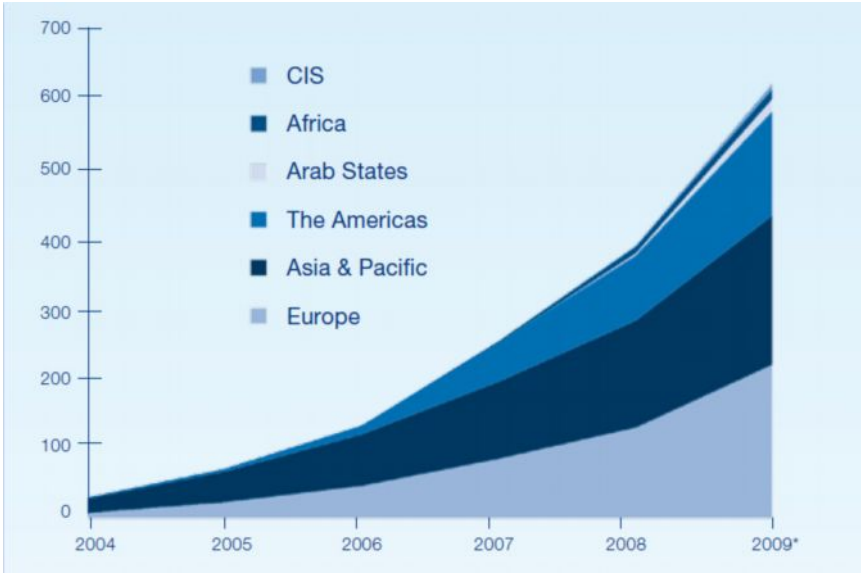
Source: ITU 2009

The number of Internet users also grew at the usual pace up until the end of 2009. At present approx. one quarter of the world’s population uses the Web. Of course the veracity of this number is very hard to confirm but, on the whole, sites publishing relevant statistical data present concordant figures: penetration is 25-26 percent, while the number of users is around 1.6-1.7 billion.

The Figure 1. shows that one of the most dynamically developing areas is mobile broadband. In 2008 the number of mobile broadband subscriptions caught up with landline (fixed) subscriptions and already significantly overtook them in 2009, indicating the hidden potential in mobile solutions. The increase is the greatest primarily in developed countries and regions with high mobile technology penetration (Europe, America, Japan). More than 80 percent of all subscriptions in North America are in the USA, while the same proportion is 70 percent in Japan and South Korea as compared with all of Asia.

According to OECD data, services based on W-CDMA and CDMA-2000 technologies are available in 29 OECD countries (for the time being WiMax technology has not gained ground), although in the majority of cases cover has not extended to the whole country. In the majority of cases there are more subscriptions to 2G than 3G, although in the developed countries the more modern technology is more widespread. In the meantime, in the countries with the most developed communications infrastructure the next generation LTE-networks are already being built. The first such networks can be found in Sweden and Norway (Oslo and Stockholm) and significant growth is anticipated by 2010.

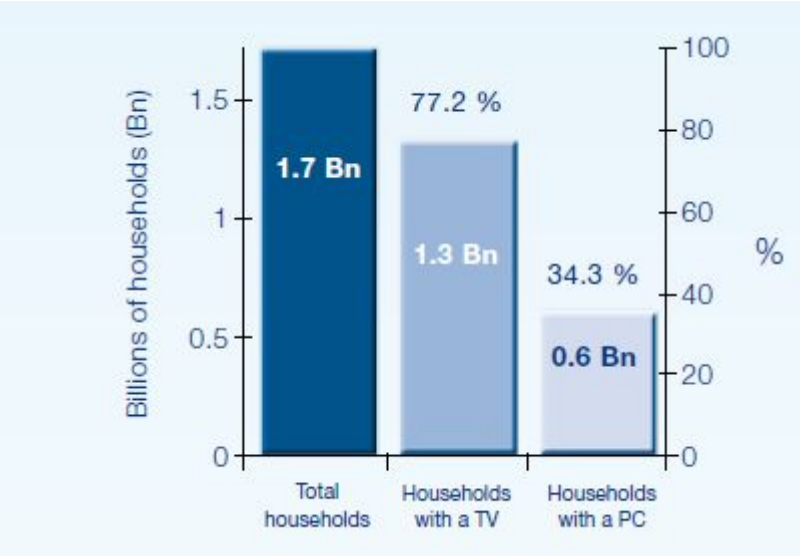
Figure 5.: Global penetration



Source: ITU 2009

It was noted earlier that some 4.9 billion people live in a household where there is a television, which means that of the world's 1.7 billion households three quarters – i.e. 1.3 billion – have a TV set. This is worth comparing to the fact that one third of all households have a PC (600 million households). Although PCs as the only or dominant tool for Internet access is continually decreasing, the following datum is nevertheless noteworthy: **close to two billion people have access to a computer in their home**. A good indication of the Internet's rapid proliferation is that just three years ago there were barely one billion Internet users, and now the two billion mark is a realistic figure to be reached within a short span of time.

Figure 6.: TV vs. PC – in billions of households



Source: ITU 2009

According to the data of TomiAhonen Consulting, in the area of **mobile telephony text messaging is the most widely used method of data transfer in the world** (see innovative practices subchapter): some three billion mobile owners use short text messages, which represents an increase of 25 percent as compared to the previous year. Another **turning point** in the first half of 2009 was that sending e-mails through mobiles was not the second most widespread service used but it was the MMS service with 1.35 billion active users. Considering all mobile phone users (discounting those who do not send text messages at all) users send an average of four text messages per day.

According to the company's data survey, there are 1.2 billion people who, generating dataflow and using browsers on their mobile phones, use services such as Google, Yahoo, Facebook and Wikipedia, which can also be accessed by mobile browsers. This figure also means (even though of course there is a significant overlap between the two groups) that more people access Internet contents through their mobile phones than through traditional PC or laptops, the number of which is estimated at about one billion.

## 7. ICT Uptake: Regional Breakdown

The number of the world's Internet users tripled between 2000 and 2007 and in the following two years increased by a further 50 percent. The increase for these years in the developing countries was even higher: from 2000 to 2007 it leapt from 76 million to 726 million, representing a tenfold increase. Despite this, **major differences can be observed between the developing countries and regions, and the developed countries.** We will review the most up-to-date usage data based on the World Stats (IWS) site. Internet World Stats is operated by the Miniwatts Marketing Group, which collects data in relation to Internet usage from sources such as Nielsen Online, ITU, GfK, local telecommunications authorities, and others.

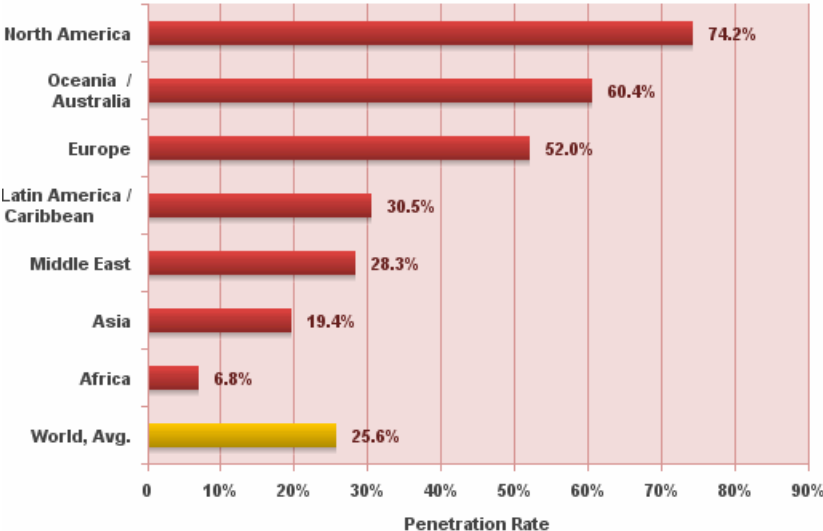
**Table 1.: Regional differences in Internet usage**

	Population	Internet users at the end of 2000	Internet users in September 2009	Penetration (users/100 person)	Global ratio (percentage of total number of users)
<b>Africa</b>	991 002 324	4 514 400	67 371 700	6.80%	3.90%
<b>Asia</b>	3 808 070 503	114 304 000	738 257 230	19.40%	42.60%
<b>Europe</b>	803 850 858	105 096 093	418 029 796	52%	24.10%
<b>Near-East</b>	202 687 005	3 284 800	57 425 046	28.30%	3.30%
<b>North-America</b>	340 831 831	108 096 800	252 908 000	74.20%	14.60%
<b>Latin-America/Caribbean</b>	586 662 468	18 068 919	179 031 479	30,50%	10.30%
<b>Oceania</b>	34 700 201	7 620 480	20 970 490	60.40%	1.20%
<b>World</b>	6767805190	360985492	1733993741	25.60%	100%

47

In regard to Internet usage per head, **North America** is in the lead with three out of four people using the Internet. Approximately a seventh (14.6 percent) of the world's total number of Internet users can be found in the United States and Canada. Compared with Africa, which is the least developed continent, huge differences can be observed: although three times as many people live in **Africa**, the number of Internet users is just a quarter of the number in America, and penetration has barely reached seven percent, i.e. only seven people in every hundred use the Internet. This number is shockingly low even if it is taken into consideration that in recent years the number of users has increased tenfold, which is only the result of the base value having been terribly low to begin with.

**Figure 7.: Penetration rate by region**



Source: IWS 2009

The great majority of **Oceania’s** 21 million Internet users – similarly to America – is comprised of the 17 million users in Australia and the three million in New Zealand, the region’s two large and most developed countries. The situation in the rest of the region shows a rather significant disparity, which is obscured by the overall penetration data. According to the latest data, every second person (52%) uses the Internet in Europe, but this figure does not show the differences between the most developed countries (Denmark, Sweden, the Netherlands) – which reach and even surpass the usage data in the USA – and in Eastern European countries.

48

**The situation is even more mixed in Asia:** a region that is home to half of the world’s population has almost half (42%) of the world’s Internet users but only every fifth person can be regarded as an Internet user here even at this rate. While – thanks to advanced fibre optics infrastructure development – in Japan and South Korea almost the whole population use the Internet in their homes (and many people access the Internet on their mobiles if they have no access at work or at home) on a bandwidth thus far unavailable to other parts of the world. In India, for example, attempts are slowly being made to establish wireless connections to provide Internet access in rural areas through hotspots.

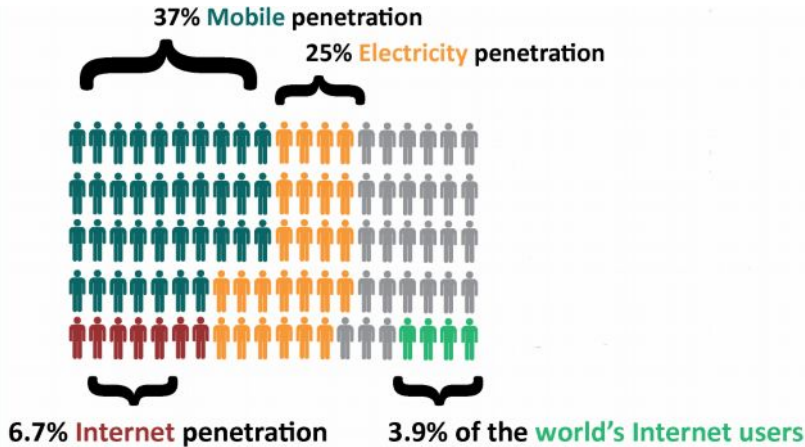
With a view to providing a comprehensive picture of the topic, the regions with major digital disparities will be discussed in the following section.

**7.1 Africa**

As mentioned previously, of all the regions of the world Africa is by far lagging the farthest behind as far as Internet usage is concerned: only four percent of Internet users live here and penetration is around seven percent. Mobile penetration is 37 percent, which is interesting because only 25 percent of the area has electricity, thus thirty-seven people out of a hundred have a mobile but only 25 percent of people live in a home with electricity.



Figure 8.: Mobile and electricity penetration in Africa



Source: Appafrica 2009

According to IWS data, **there are also significant variations in Africa itself.** Of the 57 countries ranked on the continent, only ten approach or have reached the 10-percent penetration point (see table) and half of the continent’s Internet users can be found in just five countries (Egypt, Morocco, Algeria, Tunisia and Sudan), most of which are North African countries; South Africa must also be mentioned among the most developed countries of the continent.

Table 2.: Internet penetration in Africa - ranking

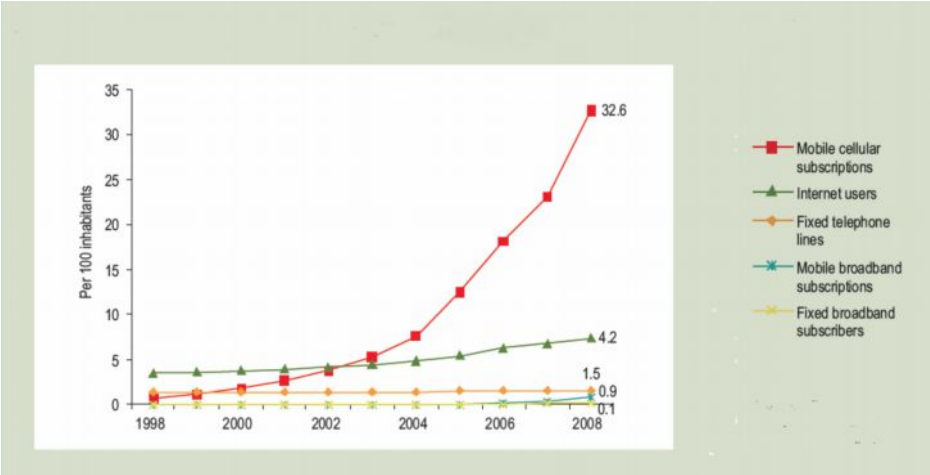
Country	Internet users	Penetration
Algeria	4 100 000	12%
Cape Verde	103 000	24%
Egypt	12 568 900	15.90%
Mauritius	380 000	29.60%
Marokko	10 300 000	32.90%
Seychelles	32 000	36.60%
South Africa	4 590 000	9.40%
Sudan	4 200 000	10.20%
Tunisia	2 800 000	26.70%
Zimbabwe	1 421 000	12.50%

Source: IWS 2009

Apart from the countries listed above, there are only four countries that have a higher penetration rate than the average for the continent: Uganda (7.7%), Senegal (7.4%), Nigeria (7.4%), and Kenya (8.6%). Ethiopia is at the bottom of the list, where out of 85 million people the number of Internet users is only 360,000, representing 0.4 percent.

It is clear that apart from mobile telephones there is scant use of other ICTs.

Figure 9.: Mobile, internet, fixed telephone in Africa

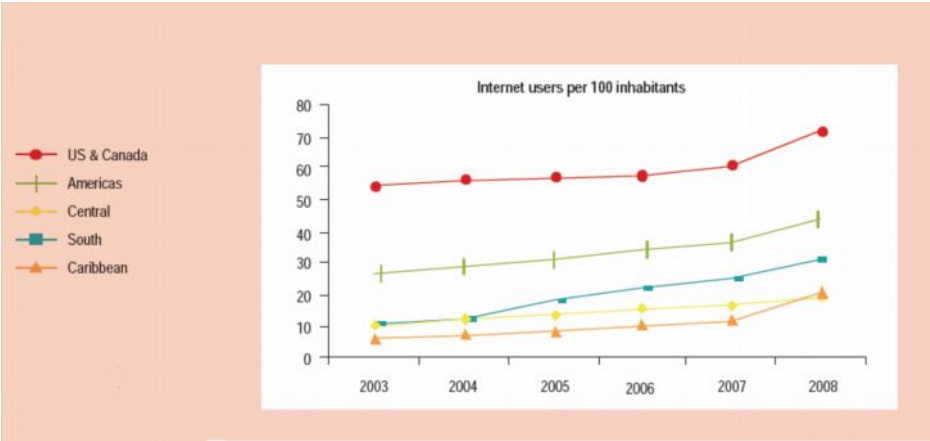


Source: ITU 2009b

7.2 Central and South America, the Caribbean

The Americas – discounting North America – present a **very mixed picture** in regard to the size of its countries and Internet penetration. Of the close to 400 million people living in the 12 countries of South America more than 136 million use the Internet, according to IWA data, which represents a penetration of 35 percent. Of the 150 million inhabitants of the countries in Central America 22 percent use the Internet, the majority of them living in Mexico; of the region’s countries more than a million Internet users can be found in Costa Rica and Guatemala. The Caribbean region is also worthy of note: there are 24 countries here and of their combined population of 41 million (i.e. in the numerous mini-island states in the region) the number using the Internet also comes to some 22 percent, i.e. every fifth person is an Internet user. Significant numbers of users in the region can also be found in Puerto Rico, Jamaica (54-percent penetration), Haiti and the Dominican Republic. Cuba is also worthy of note with 13 percent of the population, i.e. some one and a half million people, using the Internet – under strict state control.

Figure 10.: Internet users in the Americas



Source: ITU 2009c

Out of the region’s total of 175 million Internet users more than a third live in Brazil (67.5 million), but a significant number can also be found in Argentina (20 million), Columbia (19.8 million) and Mexico (27.6 million). If the number of Internet users per 100 inhabitants is considered, in regard to this indicator (with the exception of the tiny islands of the Carribean, where there are some notably high figures) it is worth noting that Jamaica is in the lead, followed by Chile (50.4%) and Argentina (48.9%). In South America, which as a whole enjoys an average rate of Internet provision, Bolivia, Paraguay and Ecuador are lagging behind, while Nicaragua (3.1%) and Honduras (8.4%) have low Internet usage in Central America.

**Table 3.: Internet penetration in Americas - ranking**

Country	Penetration
Argentina	48.90%
Bolivia	10.20%
Brazilia	34%
Chile	50.40%
Columbia	45.30%
Mexico	24.80%
Panama	27.80%
Peru	25.80%
Uruguay	38.30%
Venezuela	28.2%

Source: IWS 2009

**7.3 Asia**

**The greatest differences in Internet usage can be observed in Asia**, and this can be attributed to both geographical and economic reasons. The majority of the world’s population (56 percent) lives in this region, where the proportion of Internet users is 20 percent. However, this average is quite misleading: it includes South Korea, where four out of five people use the Internet (the overwhelming majority of the 37.5 million users use high-speed broadband that is barely accessible to the rest of the world), but also includes India, where despite the fact that the number of Internet users is twice that of the entire population of the Caribbean region, the penetration rate is still only seven percent.

**Table 4.: Internet penetration in Asia**

Country	Internet users	Penetration
Azerbaijan	1 485 100	18%
Brunei	217 000	56%
China	360 000 000	26.90%
Georgia	1024 000	22.20%
India	81 000 000	7%
Indonesia	30 000 000	12.50%
Japan	95 979 000	75.50%
Kazakhstan	2 300 000	14.90%

South-Korea	37 475 800	77.30%
Malaysia	16 902 600	65.70%
Maldives	71 700	18.10%
Mongolia	330 000	10.90%
Pakistan	18 500 000	10.60%
Philippines	24 000 000	24.50%
Singapur	3 370 000	72.40%
Tajvan	15 143 000	65.90%
Thailand	16 100 000	24.40%
Vietnam	21963 117	24.80%

The overall picture for Asia's 35 countries is extremely diverse, with the most glaring example being Myanmar (0.2%).

#### 7.4 Europe

If North America and Oceania (the latter being practically composed of two developed countries) are discounted, **the highest number of Internet users per 100 inhabitants can be found in Europe (52)**, i.e. every second person out of the total population. Similar data was recently published by the Statistical Office of the European Commission in regard to the 16-74 age group, although the 48 percent they measured were those who use the Internet daily or virtually daily.

The proportion of households with Internet access **ranges from 30 percent (Bulgaria) to 90 percent (the Netherlands)**, the other countries in the lead being Luxemburg, Sweden, Denmark, Germany and Finland. These countries also have the highest number of Internet users, along with Norway and Iceland, while the fewest users are to be found in Bulgaria, Romania and Greece, as well as in non-EU countries, namely Belarus (32 percent), Moldavia (19 percent), Ukraine (23 percent) (again based on IWS data). From these figures it is also clear that disparity in regard to the number of Internet users is completely different in Europe than in other parts of the world, since some 30 out of 100 people use the Internet with some kind of regularity even in undeveloped countries.

**Table 5.: Individuals using the internet on average daily or almost every day - Europe**

	Individuals using the internet on average daily or almost every day		
	Aged 16-74 (%)		Aged 16-74 (%)
EU27	48	Malta	45
Belgium	56	Netherlands	73
Bulgaria	31	Austria	48
Czech Rep.	34	Poland	39
Denmark	72	Portugal	33
Germany	55	Romania	19
Estonia	54	Slovenia	47
Ireland	40	Slovakia	49

Greece	27	Finland	68
Spain	39	Sweden	73
France	50	United Kingdom	60
Italy	40	Croatia	37
Cyprus	34	Former Yug. Rep. of Macedonia	37
Latvia	47	Iceland	82
Lithuania	43	Norway	76
Luxembourg	71	Serbia	25
Hungary	46		

Source: Eurostat

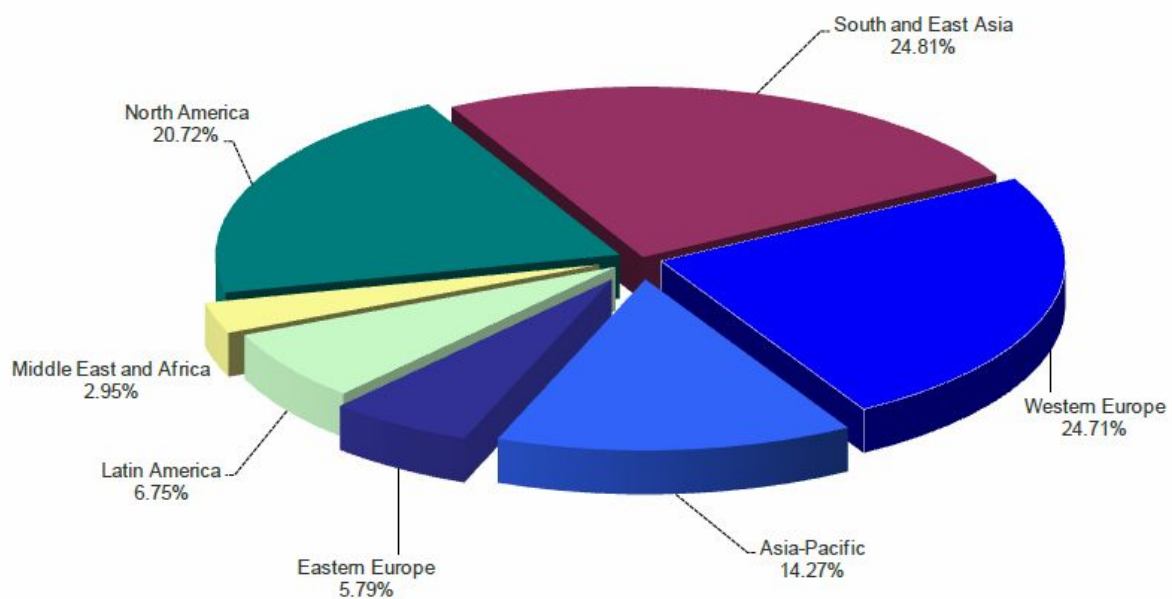
## 7.5 Broadband

**Broadband Internet represents a special quality** and provides the infrastructural basis for all those services (e.g. Web 2.0) which generated the greatest impact on society since the mass proliferation of ICT tools. **In the last five years the number of cable broadband subscriptions has tripled:** from 150 million in 2004 it has almost reached 500 million. The regional differences discussed so far are even more acute in this segment: while in Africa only one person in 1,000 has broadband, in Europe it is 200.

**At the end of 2009 China overtook the United States in the number of cable broadband subscriptions,** and presently has the most subscribers. However, because of China's huge population, this represents a penetration of only 6.2 percent in total, this value still being higher than the proportion in Asia's poor countries. The price of cable broadband remains high in most developing countries. Partly because of this the average penetration rate of broadband in low-income economies was two percent, and mostly restricted to urban areas. It is clear that the true advantages of broadband (and along with this those of the Internet) are not yet available to developing countries.

According to the latest survey by Point Topic, **at the end of the third quarter of 2009 there were a total of 452 million cable broadband subscriptions in the world;** this number rose by some 50 million this year as compared to 400 million at the beginning of 2009. In regard to the regional distribution of subscribers, Asia and Europe are neck and neck in the lead with almost the same number of subscribers (24.81 percent and 24.71 percent), although the Pacific Ocean region should not be overlooked either since the figure here is 14 percent. One fifth (20.72%) of all broadband subscriptions can be found in North America.

**Figure 11.: Broadband in the World**



Source: Point Topic 2009

**In the case of broadband subscriptions the various technologies should be considered.** According to a survey conducted by Point Topic, DSL technology based on copper wire is the most widespread (295 million subscriptions), with 65 percent of all cable broadband connections using this technology. The second most popular technology is cable modem at 20 percent (92 million subscriptions), while the third most popular (with the greatest pace of expansion) is fibre optic broadband, or FTTx, with 12 percent (55 million subscriptions). It is worth noting about the latter that the overwhelming majority of its subscribers (82 percent) are to be found in the developed Asian countries, especially Japan (16 million subscribers) and South Korea (7.2 million subscribers) , but the highest number (21.6 million) of such subscribers can be found in China, which is developing by leaps and bounds.

The OECD survey made in the organisation's member states support the data from Point Topic: according to their data, in the 30 OECD member states 158 million inhabitants subscribed to **DSL technologies**, 76 million to **cable modem** and 26 million to **FTTx**. The somewhat greater proportion of cable modem subscriptions results from this technology being the most widespread in the USA because of the peculiarities of the telecommunications market.

The gaining in ground of DSL connections is also supported by a report made by the European Commission. Based on the data, in the studied EU countries DSL triumphs over all the other technologies, thus preserving its leading position. A result worthy of note is that fibre optic broadband increased by 40 percent in one year, although one major disadvantage of this technology is that it is only available in a few countries.

Research jointly conducted by Oxford University, Oviedo University and Cisco Research Centre included the study of broadband penetration and the evaluation of the range and quality of services based on this technology. According to this research, South Korea is ranked number one in regard to both broadband penetration and the quality of the services. Four Asian and six European countries were rated in the first ten places.

**Table 6.: Broadband and quality of services – worldwide outlook**

		Penetration of services based on broadband	Quality of services based on broadband (Broadband Quality Score) 2009	Index number (broadband penetration and quality of services)
1	South Korea	97%	66	139
2	Japan	64%	64	115
3	Hong Kong	99%	33	111
4	Sweden	69%	57	110
5	Switzerland	90%	40	108
6	Netherlands	83%	46	108
7	Singapore	96%	32	107
8	Luxemburg	99%	27	107
9	Denmark	82	45	106
10	Norway	84%	38	102

*Source: Oxford University, Oviedo University and Cisco Research Centre*

This proportion is not surprising if the top 30 list of ITU is considered, since it includes 19 European countries and, which with the exception of the Asian countries, includes only the United States, Canada, Australia and New Zealand.

**Figure 12.: Top 30 economies in terms of fixed broadband subscribers per 100 population, 2008**



Source: ITU 2008

The Point Topic survey also focuses on the countries with the greatest rate of increase in the area of broadband in one year. This indicator is the highest in Indonesia, where in one year the number of subscriptions has more than doubled (a 106-percent increase, or 400 thousand new subscribers), but also worthy of note are Moldova (100 percent, 74,000) and Belarus (95 percent, 153,000).

India is the only country with more than a million new broadband connections. Here the number of new broadband subscriptions increased by 62 percent, which represents 2.5 million new subscribers.

Thus far it is primarily cable broadband technologies that have been described. According to the latest broadband report by the World Bank, by the end of autumn 2009 the total number of broadband subscriptions had exceeded one billion, these numbers underscoring the differences between developing and developed countries. In the developed world it is frequently the case that one user has both cable and wireless broadband subscriptions. With the advent of the new generation of wireless technologies the time could come when the two technologies are no longer complimentary but will instead be two competing services – of course only in places where the appropriate infrastructure exists.



**Table 7.: Broadband subscribers and market penetration**

	<b>Broadband subscribers (million)</b>	<b>Market penetration (per 100 inhabitants)</b>
East Asia & Pacific	381.4	17.8
Eastern Europe & Central Asia	49.2	12.4
European Union (EU-27)	294.1	60.5
Latin America & Caribbean	52.4	9.2
Middle East & North Africa	27.8	7.6
North America	210.9	62.5
South Asia	9.1	0.6
Sub-Saharan Africa	15.6	1.9
World	1040.6	15.6

*Source: Worldbank 2009*

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