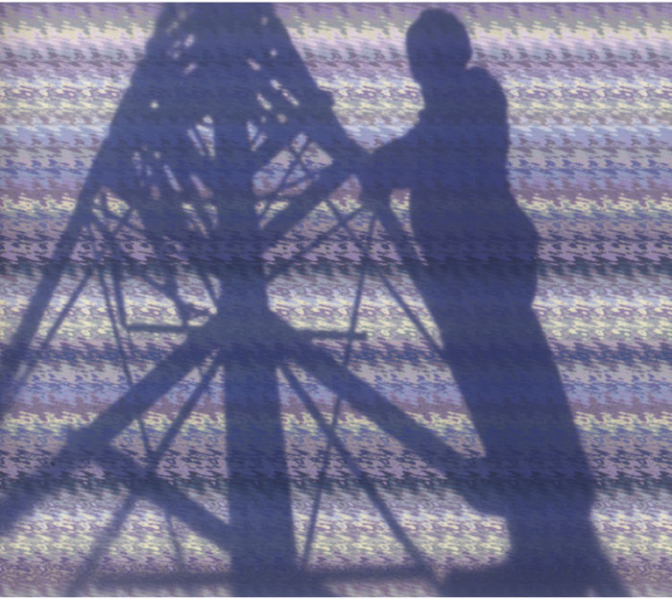
DEVELOPMENT AND THE INFORMATION AGE

Four Global Scenarios for the Future of Information and Communication Technology



EDITED BY
JOHN HOWKINS & ROBERT VALANTIN
FOR THE INTERNATIONAL DEVELOPMENT RESEARCH CENTRE AND THE UNITED NATIONS COMMISSION ON SCIENCE AND TECHNOLOGY FOR DEVELOPMENT

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edited by
John Howkins & Robert Valantin

for the
International Development Research Centre

and the
United Nations Commission on Science and Technology for Development

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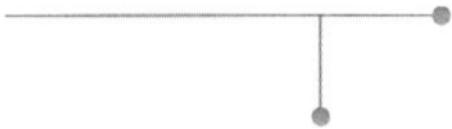

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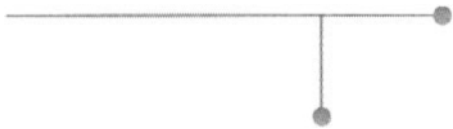

Foreword

The importance of information and communications, the speed and volatility of change, and the lack of consensus as to their impact, led the United Nations Commission on Science and Technology for Development (UNCSTD) to select information and communication technologies (ICTs) and development as its main theme for the period 1995–1997.

UNCSTD is a standing body that meets every 2 years. Between these plenary meetings, it operates through various working groups. We were asked to chair the process of preparing the main reports for the session on ICTs and development with the help of a working group of members of the Commission (the group's objectives are presented in Appendix 2). A part of this process involved commissioning a number of background papers and drawing on inputs from two conferences on the topic convened by the Institute of New Technologies of the United Nations University.

However, we were aware of the many unknowns surrounding the topic. Academic studies of past experiences could provide some clues to future actions, but the opportunities opened by the "Information Revolution" are so new and, in many cases, untested that we felt the past is no certain guide to the future. We were aware that in such cases of extreme uncertainty both governments and private corporations had sometimes found it useful to develop scenarios of possible futures.

The main value of undertaking a scenario-building exercise is to help build a common understanding about the complexities of the topic being considered among the participants in the exercise. The shared mental map at the end of the process is frequently very different from the many individual views that the participants bring to the start of the scenario-building process. We felt that if we could achieve this shared mental map among a core of the UNCSTD working group we would be in a better position to prepare our main report for the full Commission and to reach consensus on recommendations.

We received an enthusiastically positive response to this idea from many members of the working group, and Robert Valantin arranged for the International Development Research Centre (IDRC) to cosponsor and cofinance the workshop. It was held in delightful surroundings at Kelburn Castle in Scotland in June of

1996. There were 27 participants from many different countries. This number included six specially invited speakers and three facilitators, including Barbara Heinzen and Steve Rosell.

There was a danger that we would try to compress too much "learning" into the 5 days of the workshop. However, at the end of a cathartic experience, four scenarios — or stories about the future — were developed. They subsequently provided the basis for the working group's analysis of commissioned papers and helped provide the orientation for the group's recommendations to national governments.

The original purpose of the workshop was to build the shared mental map among the working group members. It certainly achieved that objective. But it also seemed worthwhile to share the story of the process and the resulting scenarios with a wider audience. Robert Valantin readily agreed, and IDRC commissioned John Howkins to prepare the story, drawing on the background materials and a long draft report of the workshop, which had been written by Amitav Rath. Robert Valantin, who had been a member of the Kelburn team, contributed to the Howkins draft and is a coeditor of the report.

Fernando Chaparro (Colombia)
Geoffrey Oldham (United Kingdom)
Co-chairs, UNCSTD Working Group on IT and Development

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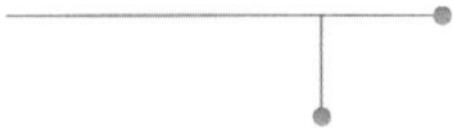

Preface

Around the world, new information and communication technologies (ICTs) are creating or supporting innovative systems and networks that are increasingly affecting societies and their governments, industries, communities, and individuals. It is vital that these technologies, and the opportunities that they create, be used to help close the gap between North and South, between the "included" and the "excluded," so that everyone has equitable access to sustainable development and growth.

The United Nations Commission on Science and Technology for Development (UNCSTD) selected ICTs and development as its key theme for 1995–1997 to enhance awareness and understanding of the issues involved and to promote new initiatives at the national, regional, and global levels. In its research, the Commission joined forces with Canada's International Development Research Centre (IDRC),

which supports research and capacity building in the developing regions of the world, in keeping with its mission, "empowerment through knowledge." IDRC has been actively working on issues of information access, communication, and ICTs and development since its creation in 1970.

In 1996, IDRC and UNCSTD worked together to determine whether the techniques of scenario planning could provide useful insights into the future impacts of ICTs on development and could inform the public policy choices that are now facing governments and development agencies. As part of this process, IDRC and UNCSTD held a workshop in Kelburn, Scotland, in June 1996 to develop scenarios for the future of ICTs and development.

This publication describes the background to the workshop and the scenario planning process, and presents the four scenarios that resulted. Based on these scenarios and the Kelburn Workshop process, it draws some important conclusions.

It is of course usual to thank the institutions and individuals who collaborated professionally to make the Kelburn Workshop a success and this publication possible. Special thanks to UNCSTD and IDRC for supporting this challenging activity, to our excellent facilitators Barbara Heinzen and Steve Rosell and their assistant Tanya Holt, to Liseby Pétrin who handled the administrative arrangements at IDRC, to Amitav Rath who

prepared a detailed draft report of what occurred during the workshop, to John Howkins who wrote much of this document, and to many others who assisted in one way or another. I would also like to express gratitude to the participants, including the outside experts who acted as "challengers," who took part in this tightly compressed and at times highly charged event. One of the steps was to examine and then tear apart our individual assumptions and worldviews, and this is never easy, especially in a brief time frame and with complex issues. Nevertheless, tremendous enthusiasm and good will led to our coming together with some common understanding of the issues involved and a set of scenarios that reflected our collective views of what may be possible.

Most of all I would like to thank Lord and Lady Glasgow, who invited us all into their home and created a warm and friendly environment in which we carried out our work. There is some incongruity inherent in discussing new technologies in a castle that has been around for 800 years, but our hosts made it seem very right. And what better place to maintain perspective when looking at the future than one steeped in the past?

Robert Valantin
5 May 1997

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Background and Methodology

The Information Society

There is daily talk of a new kind of "information society," transforming virtually all spheres of human activity. Some see the information society as involving all processes — including language, information processing, and cognition — that can be carried out electronically and can affect the ways we communicate, create relationships, and undertake transactions. Others regard it as a new "techno-economic" paradigm, following earlier step changes such as the introduction of new spinning devices in the cotton textile industry in 1780–1840, which enabled the British to maintain global economic leadership for almost 100 years; the use of coal, especially in steam engines; the use of steel, electricity, and railways; and the development in

the 1940s of oil and petrochemicals and the automobile as mass transit.

Today, inexpensive desktop computers and high-speed telecommunication links allow someone with hardly any training (except basic literacy, keyboard, and point-and-click skills) to retrieve and manipulate data from various sources, easily and cheaply. In doing so, they enter a "digital universe," creating new kinds of communication and transactions, many of which happen entirely in this virtual space. Digital coding has moved out of the computer and into the telephone network and the broadcast channel. The marginal cost of handling information in a computer or moving it along a network is effectively zero. Or, rather, the technology allows it to be near zero; public regulations, private contracts, restrictive practices, and taxes often impose a direct and sometimes significant cost to the user.

Some things about the technology are certain. Gordon Moore's law that computer power doubles every 18–24 months still holds true even after 25 years. The number of computers, Internet connections, and television channels grows everywhere.

But the nature, content, cost, and impact of ICTs cannot be easily forecast. For example, while today Internet usage grows dramatically, the future of the Internet itself is not clear. The Internet may remain unchanged and grow exponentially for decades. It is

equally possible that within as few as 5 years, the Internet's core technologies will each generate its own sector with its different economic models and regulatory controls. In terms of total impact, while it may be true that ICTs affect everything from working hours to home movies to the balance of trade between some countries, such a grand statement is only true at such a high level of generalization as to be meaningless. We need to be more precise.

We need to understand the exact nature of the challenges posed by ICTs to existing societies and economies. We need to know what we mean by the "information society" and the "creative economy." Above all, we need to imagine how ICTs may develop not just in rich urban societies but in all societies, in all countries, and in all sectors of these societies and countries.

The stakes are high. While the countries of the Organization for Economic Co-operation and Development (OECD) are becoming more aware of the "haves" and "have-nots" within their own societies, there is a similar but much larger division between "haves" and "have-nots" on a global scale.

Can ICTs help to close the gap? Or will they widen it? Access to the skills, equipment, and networks that allow entry to the information society are largely the privilege of rich countries and, elsewhere, select urban centres and the elite within them. Developments in the

North are moving much faster than those in the South. The flow of information, knowledge, and resources is mostly North to South; there is still very little South to North or South to South.

Governments cannot stand still and hope that things will became clearer or that their positions will be stronger in a year or so. Decisions need to be taken now and are being taken now. The Marrakesh decision of the General Agreement on Tariffs and Trade, which liberalized trade in the telecommunications industry, has brought telecommunications within the global trade regime operated by the World Trade Organization (WTO). Governments are setting policies for education and employment. Manufacturers are choosing where to focus their research and development (R&D). Companies and individuals are adapting ICTs to their own purposes.

This publication begins the process of exploring global policy options for international agencies and national governments in the face of these uncertainties. It does so by presenting four scenarios of ICTs and development over the next 15–20 years.

The Principles of Scenario Planning

ICTs evolve in a rapid and volatile manner (see Chapter 2). Their future and their impact on society is uncertain. In such circumstances, scenario planning can be a useful tool.

Scenarios are not predictions or forecasts of the future. Instead, they enable planners and decision-makers to envisage possible futures by taking account of bedrock certainties, things that may or may not happen, and complete uncertainties.

The technique was pioneered by Royal Dutch Shell, which was as a result better equipped to manage its own responses to the unexpected oil crises in 1973 and the 1980s. Since then, scenario planning has been used by many other industries to help them develop infrastructure and services. It is especially helpful when politics, regulation, technology, or some other factor might radically alter an activity and create a step change. A former certainty may become an uncertainty or a new certainty or uncertainty may arise.

The scenario process is formal and structured. It starts with an open brainstorming session in which people put forward their views about a specific situation, specify variables, and raise issues from today to, say, a 15-year horizon or beyond. Sometimes the moderator will ask each person what he or she would ask of an oracle who had promised to answer three questions: what are the three most important questions about the topic under review for which one would like to know answers?

The resulting ideas are assembled and analyzed to reveal underlying patterns. Each scenario starts with

certainties and introduces uncertainties. The interaction of the various either/or "uncertainties" (such as high/low growth and fragmented/cohesive systems) will require at least two scenarios, but usually three or four.

The scenarios should not just tell a believable story but should also identify the main decision points faced by decision-makers. Decision-makers should feel that the scenarios have touched their deepest, most radical concerns. They should then be willing to test their future decisions against each scenario. Scenarios should always connect to realistic choices and ultimately to decisions and action.

Scenario planning does not demonstrate which scenario is the most likely. The aim is to uncover and articulate the basic parameters in a believable situation, regardless of whether the planners and decision-makers regard them as likely to happen. By spotlighting paths ahead, the process can also help to identify areas that remain in darkness.

The Kelburn Workshop

To explore the applicability of this technique, IDRC and UNCSTD held a 1-week workshop at Kelburn Castle, Scotland in June 1996, to produce scenarios on ICTS and development.

The participants at Kelburn were mainly senior government officials, including scientists and technologists with high-level experience with ICTs and ICT policy (see Appendix 1). Two other groups of people attended: four experts on ICTs, and two experts in scenario planning (Steven Rosell, who led a recent exercise in Canada to determine strategies for governance in the information age, and Barbara Heinzen, who has 10 years experience in scenario planning).

The Kelburn Workshop followed the main principles of scenario planning, although severely compressed into a much shorter time period than usual. The process started with the participants providing their individual views of the key variables and finished, after exposure to relevant information and opinions (including the views of the four outside experts), with a set of four scenarios. Throughout, the two facilitators pushed participants to think more deeply and more radically; in the phrase of Herman Kahn, another pioneer of scenario planning, "to think the unthinkable."

This report starts with the raw materials for the topic at hand: development issues (Chapter 1), ICT issues (Chapter 2), and ICTs and development (Chapter 3). It then describes the two critical uncertainties that inform the future of ICTs and development: the global system and national policies (Chapter 4). On the basis of the analysis and the uncertainties, it presents the four scenarios that were developed (Chapter 5). Finally, it draws a number of conclusions (Chapter 6).

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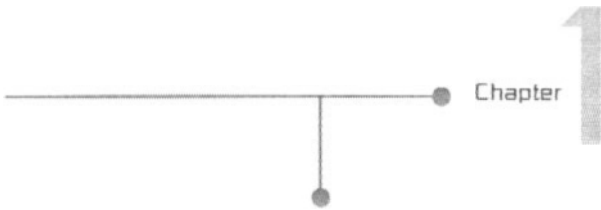

Five Indicators of Development

The Kelburn Workshop began with a discussion on the nature of economic and social development. It reached a broad consensus on five priorities:

- **Literacy, education, and skills** (literacy, education, training and skills, and opportunities for all members of society to increase their capacities) — The availability and level of education is an indicator in its own right; it also contributes to increased individual and social choice, and is a prerequisite for better democracy and governance.

- **Health** (life expectancy, maternal and infant mortality, quality of life, and the levels of health care available in situations of morbidity) — Physical health and well-being are basic requirements of stable population growth and the ability to function more effectively on a regular basis.

- **Income and economic welfare** (high levels of employment, high incomes per capita, and increased gross national product, with appropriate corrections for environmental protection and for income equity) — Personal savings and investment to support structural change are important.

- **Choice, democracy, and participation** (participation in social and economic affairs, with fair economic rewards, the availability of reasonable choice, and participation in the democratic process) — The political process can enable or inhibit development. The importance of good government and appropriate democratic institutions to articulate social goals cannot be over-emphasized. Participants were not greatly concerned with the formality of these organizations, but were much more interested in their effectiveness in serving social goals.

- **Technology** (the capacity to develop technological innovations and to make technological choices) — Few countries are capable of radical innovation as R&D becomes more expensive and complicated. For these countries, a more appropriate indicator is the capacity, in terms of know-how and wealth, to make the appropriate choice between competing technologies and to develop or adapt technology to fit their own needs.

Cultural indicators are also obviously important, but can be problematic. They are difficult to quantify, and there is little consensus about which cultural values actually support development. OECD countries exhibit varying attitudes and approaches to support learning, innovation, wealth creation, and social development. There are similar differences found in developing countries.

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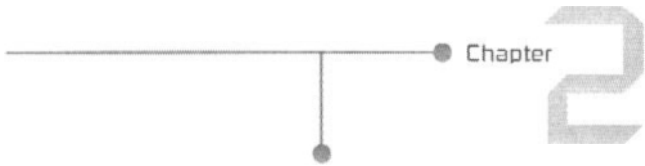


Information and Communication Technology Issues

Technologies and Services

ICTs continue to evolve at a rapid rate, although there is little agreement about which specific products or services will succeed and for how long. We are experiencing a tsunami of innovation characterized not so much by any single technology or science but rather by the intermingling of several crossover technologies and services.

At the core is the ubiquitous microprocessor, providing control and memory. Microprocessors are found in almost every mechanical and electronic device from control units (such as traffic lights) to online tools (like Internet browsers). Grouping these together as ICTs

may obscure substantial differences in technique, application, cost, and impact.

Today, the greatest growth is in networked services. Even the simplest data network, linked by narrow-band telephone lines, can have a dramatic effect on organizations and individuals.

The growth of networking then raises the question of computer "intelligence," based on increasing memory and more sophisticated processing software. What forms will intelligence take, and where will it be located? Will it be in the user's own device, in the network, or both? The outcome will have a major impact on all sectors and countries. Computer intelligence, however it is defined and wherever it is located, is a core driver of industrial change; but different network architectures favour, and are influenced by, different national strategies.

Economics

Information and communication technologies (ICTs) challenge current economic thinking. What does it mean to own information? If I give you my land or my money, you have it and I don't. If I give you intelligence or an idea, we both have it. The traditional economic theory of the firm assumes "perfect information" and examines changes in supply, demand, and price. The economics of information overturns that basic assumption.

This is most evident in the economics of software. Software has a high R&D cost, a low manufacturing cost, and a low distribution cost. For users, the cost may be high if the software necessitates retraining or the acquisition of a more powerful processor to run it. In many cases, manufacturers give software away; charging licence fees could be counter-productive. One reason the Internet has developed so quickly is that the major protocol owners have charged rights fees to producers (servers) but not to end users (clients).

Intellectual property rights (IPRs) such as patents and copyrights are the main unit of value in an information economy. Copyright law is a mechanism for balancing the owner's need for reward and the public's need for access. Some people say that digital formats make copyright unworkable. Copyright owners naturally resist this idea. If IPRs wither away, then rights owners must operate a system of private contracts. Developing countries may gain short-term benefits because they would have free access to others' work. But, in the long run, everyone must work together to establish a commercial basis for rewarding rights owners, encouraging further innovation, and allowing access. This is one of the dilemmas facing national policymakers in developing countries, both domestically and at the global level.

Regulation

The regulation of ICTs is heavily influenced by the changing role of government and by business imperatives. Both play a very different role in the ICT sector from their role in most public-service provision (such as education) and industry (such as manufacturing). In general, government is moving from being the owner and operator of communication systems (telecommunications, broadcasting) to being the referee of private companies in terms of industrial, trade, competition, and other related policies. This liberalization is also the dominant force in industry.

When dealing with ICTs, policymakers are confronted by widely varying cultural and economic values. The computer industry is free-wheeling, entrepreneurial, idiosyncratic, global, and unregulated. Telecommunications is mostly nationalistic, monopolistic, and highly regulated. So far, deregulation has been somewhat of a myth. Although there is a strong trend toward the liberalization of ownership and control, this has only come about through more regulation.

Policymakers need to create new policy principles for convergent services that mix

- **Computers** — unregulated and highly competitive;
- **Telecommunications** — governed by regulated notions of equity and access; and

- **Content** — governed by regulated notions of what is right and proper in society.

International Frameworks

The role of international organizations is crucial especially in telecommunications, because of the requirement to have standardized or compatible protocols between the two ends of the connection. Otherwise, communication literally cannot take place.

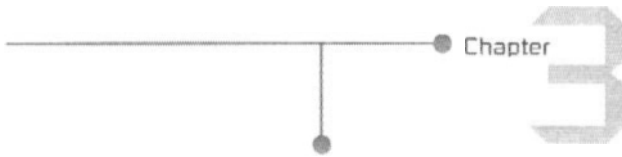
This gives international organizations such as the International Telecommunication Union (ITU), the oldest agency of the United Nations (UN), and the World Trade Organization (WTO) a power and influence that other agencies may not have. The creation of the WTO moved telecommunications from being a distinct sector, dominated by state bodies, to the mainstream of trade. It also has an impact on the ways in which national governments and regional trading blocs (such as the European Union [EU] and the Association of Southeast Asian Nations) organize their responsibilities. At the same time, the growth of bilateral and regional arrangements has led to a large number of unofficial proprietary standards that may undercut the role of the official intergovernmental agencies.

Inherent Uncertainties

As a result of these trends, ICTs worldwide are subject to several intrinsic instabilities:

- Definitional — a lack of consensus about definitions and a lack of clear boundary lines;
- Technical — rapid, unexpected developments in R&D and manufacturing;
- The need to invent new legal and regulatory regimes and regulatory principles;
- Fragmented administrative responsibilities at the global and national levels;
- Evolving new economic theories of intangible goods and exchange;
- Undefined and volatile public needs and wants (as citizens and as customers); and
- Shifting relationships between the public and private sectors.

These uncertainties require public policy to be comprehensive, far-sighted, and flexible both at the global and the national levels.



The Combination of ICTs and Development

Key Trends

It is important to recognize that ICTs can often produce contradictory results simultaneously: homogeneity and fragmentation, for example, or greater equality and greater inequality. ICTs can both destroy and create jobs. Some believe globalization is a major factor; some do not. Some believe that differences between people and between countries are increasing; others, that they will diminish. Prediction becomes hazardous as individuals and organizations, embedded in social, cultural, and financial structures, use ICTs to select their own services, create content, and manipulate information.

Terms like globalization and a wide-eyed approach to technology (assuming that technology is socially

neutral) obscure the many different realities. In Africa, for example, countries that emerged from colonial rule took, whether by will or by happenstance, entirely different routes. In some countries, the nationalist struggle has achieved a social transformation. In others, the government has been swayed by sectarian interests, and large numbers of people are marginalized. In these societies, volatile and divided, the mood can swing rapidly from hope to fear. One speaker at Kelburn said we have moved through four eras: "colonialism," motivated by a desire to control others; "liberation," motivated by a desire for self-control; "development," motivated by a desire to catch up; and "technology," motivated by a fear of losing out.

Another speaker said that all countries are moving away from protectionist, exclusive, economic regimes to more liberal, inclusive regimes with low tariffs, a greater role for the private sector, and more open trade. The speaker indicated that companies use ICTs to eliminate geographic barriers and time zones, and small offices can supply all the services of large offices. The key drivers of change are globalization, economic liberalization, and technological change. These forces tear the social fabric. Tension will increase, as will, specifically, income inequalities, job insecurity, job mobility, and disempowerment. Each country will respond differently according to its history, culture, values, and institutions. According to this

view, only two responses will be successful: either a hypercompetitive, individualistic, and libertarian attitude, as found amongst many Internet users and software companies, or a new social contract between government and industry, creating a long-term vision and social cohesiveness. Societies that do not adapt will be left behind, some falling into chaos. Countries that are reluctant to change and try to put up barricades will not succeed. Global markets will punish unsustainable economic behaviour.

Workshop participants also indicated that major areas of uncertainty include

- The role of ICTs in governance and the political process;
- The role of ICTs in work, employment, and wealth creation;
- The impact of ICTs on the social sector (such as in education and health);
- The impact of ICTs on localism; and
- Vulnerability and crime.

Government Responsibilities

ICTs will not bring greater equity, participation, or employment unless governments implement appropriate policies. Some participants believed governments

are capable of this. Others emphasized the intense particularities of existing political, ethnic, and cultural systems; the lack of agreement on the nature of ICTs and their impacts; and, therefore, the difficulty of making robust policy decisions.

There are two loci of public policy. The first is centred on the communications and information industries and based on sectoral concerns about infrastructure and content. The second is driven by wider public concern about health, education, employment, public expenditure, foreign ownership, culture, etc., which are themselves affected by changes in communications.

The two policy circles overlap. For example, communicating requires networks. Very few countries can afford to use tax revenues to build their networks. So they must either wait until private funds are sufficient (which may take many years) or licence one of the half dozen or so global consortia that are willing and able to build infrastructure. This raises a number of fundamental questions. What is the balance between ownership, control, access, and impact? Is having a telephone network owned by a foreign company worse than not having one at all? How does a country without much domestic expertise in software ensure that it acquires the network it needs?

Tariffs are another important issue. In OECD countries, the average rate for telephone access and for

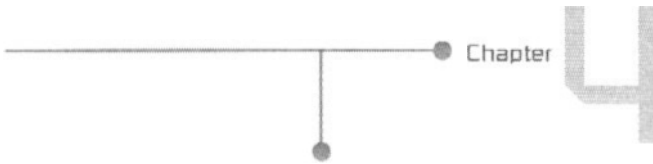
Internet access is about 1 % of average income (and using both services costs 2 % of income). Rates in developing countries are usually higher. Indeed, there is an inverse correlation between per-capita income and the cost of access: the higher the income, the lower the cost. As a result, although many have access in principle, few can afford it. Governments face a challenge: whether to put the priority on higher charges, to increase revenues in the short-term, or to reduce charges to increase traffic.

Many of these problems are amenable to, and call for, public policy. Governments can control public expenditure on infrastructure (subject to available resources). They can control national competition policy. They can set limits on foreign investment. They can use the principle of "planning gain," whereby they allow private development on condition the company makes some social investment in roads, education, etc. They can influence the creation of new skill sets through the school curriculum and by training teachers in the new skills.

Each government needs to formulate a full response to this challenge. A complete policy regime has these characteristics:

- Covers all of the development indicators listed in Chapter 1;

- Reflects the reality of the information society both globally and nationally, and in terms of the public and private sectors; and
- Is sensitive and flexible.



Basic Uncertainties

The key trends identified in Chapter 3 can be distilled into two basic uncertainties related to the global community and national policies. Each uncertainty raises questions:

- **The global community** — Will its value systems become more inclusive and open, or more exclusive and closed?
- **Individual countries** — Will they have a complete or partial (proactive or reactive) response to ICT acquisition and use?

The global community has two value systems jostling for power. One is inclusive, open, and enabling with solid attempts to integrate the weak and disadvantaged. The other is exclusive, fractured, restrictive, a Darwinian world, red in tooth and claw, dominated by the strong and powerful for their own ends, with increasing concentrations of technology, wealth, and

power and little regard for those left behind. The difference is not simply one between private and public. It is more the difference between cooperation and exploitation.

In turn, national responses range from being complete and positive to being partial, disengaged, and reactive. Some countries have ambitions to learn and create strong policies at home and take a full part in global debates and negotiations. Some want to respond but lack the resources. Others are unresponsive to the challenge. Again, this need not be a split between government and the private sector. Governments must lead, but the whole country must learn. It is also important to realize that being active does not necessarily mean being controlling. And doing nothing is just as much a policy as doing something, except that doing nothing often precludes learning. Most people, and most organizations, learn from their mistakes.

Given these two uncertainties, the Kelburn Workshop devised four scenarios (Figure 1). Each scenario starts with the same certainty that technological innovation will continue for the foreseeable future. The dynamism of the information and communication industries will continue to fuel a roller-coaster ride of research, investment, development, acquisition, and wealth creation. These companies' shareholders and managers are focused, aggressive, and visionary. These factors, more than any public policy, are the

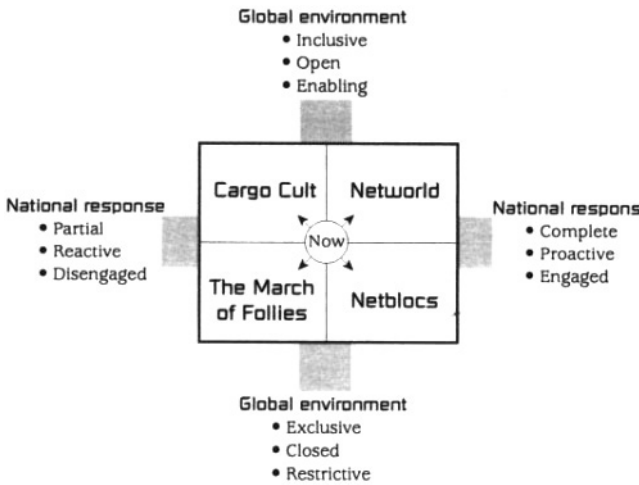


Figure 1.
Two uncertainties: national responses and global environments.

drivers of change. But then each scenario diverges according to the two uncertainties defined at the beginning of this chapter. So while the levels of technology expand under all scenarios (a key certainty), the levels of access to technology and its potential benefits vary (a key uncertainty). The interaction between certainties and uncertainties will determine the future. The time scale of the scenarios developed in Kelburn is 15 to 20 years, up to the year 2010 or 2015.

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Chapter 5

The Four Scenarios

The Kelburn participants gave shorthand names to the four scenarios they developed. These correspond to the four quadrants of the cross (see Figure 1) and were called *The March of Follies*, *Cargo Cult*, *Netblocs*, and *Networld*.

The March of Follies

Assumptions

- **The global community is exclusive and fragmented.**
- **Most developing countries respond only partially and reactively to the acquisition and use of ICTs.**

The scenario starts with the certainty common to all scenarios: the level of technology, and the means of selling it, increases by leaps and bounds. The immense cash profits and monopoly rents available to electronic gatekeepers push these companies

inexorably toward merger and concentration. Software companies use their intellectual property rights (IPRs) and installed customer databases to extract a quasi-levy from all users of computers and the Internet. Content companies do the same in entertainment and, increasingly, in education.

Their ambitions are encouraged by the global business community and by governments. Money follows technology, and the technology follows money; there is no other guide. Technology certainly doesn't follow basic needs. There are no real attempts to direct the technologies for public benefit, either in OECD countries or anywhere else. Corporations are free to exploit cheap labour anywhere in the world, and cities face job losses when employers find cheaper labour in another country. Many people oscillate between overwork when work is available and no work when it isn't. Countries that try to maintain public welfare systems face bankruptcy as work and the resulting tax revenues move elsewhere. Private companies set the criteria for infrastructure investment and management as did the railway companies in the 19th century. Places that do not meet their criteria do not get networks. Governments cannot maintain a sensible cost structure in the face of private competition. As a result, places either have a private network or they have nothing.

The corporate world operates in its own short-term interests to exploit untapped markets. Companies move to export their brands and services as fast as possible.

Most developing countries also act in their own short-term interests. They erect protectionist barriers such as import tariffs. They take a passive view of global markets. They are active only to the extent they erect barriers to trade; they do not introduce policies to generate domestic industries.

All players put short-term interests above long-term interests. The global corporations exploit urban markets, but do not seek to develop mass markets and do not try to respond to local needs. Dumping increases. There is a lack of government-to-government coordination and a corresponding increase in quasi-official and often quasi-legal parallel structures. Self-interested elites become more prominent. Vulnerability and fraud increase. International law enforcement is starved of resources.

Governments, determined to be self-sufficient, do not cooperate with the WTO and are locked into outdated trade practices. They continue to depend excessively on outdated technologies and on hierarchical management, and fall further behind.

The trade boom of 2000–2005 is seen to be a high burn. Exports slow down. It becomes clear that

companies had failed to develop new markets. They had encouraged the growth of urban "hot spots" — the main cities and a few coastal strips — while villages and rural areas remain unconnected. Most people in developing countries are therefore excluded. The exchange of information from village to city to the global level, and back, is hesitant and hardly listened to. After some years of this divisive scenario, the WTO's OECD members propose a new agreement on trade-related intellectual property issues. The developing countries, with a few exceptions, do not have a clear alternate strategy.

The global village arrives but, as in many villages, the neighbours have different interests and occupy different realities, in terms of both real space and cyberspace. The new world map has poles of growth where people share money, fashion, myth, and power. Regions outside this network become increasingly marginalized. The global commons withers away.

There is a sharp bifurcation between the elite and the rest. The elite move freely (in real space and in cyberspace) and many have a base in New York, Geneva, or Singapore. But the rest are marginalized. Their own traditional national identity is diminished and replaced by a larger but fuzzier global identity. They see world movies and buy world goods, they are employed by people trained in global qualifications, but they do not earn enough to take a full part in all

of this. The gap between the nomadic wealthy and the local poor is very wide, and appears unbridgeable and meaningful.

By 2010 the "development debate" is virtually dead. Few notice that the UN is moribund. The continuing fighting in Rwanda is reported by the one news channel still covering international affairs, but with little impact. Everyday the stories are the same: some people somewhere with not enough to eat, some cases of mass migration, poor people trying to invade rich areas, scenes of violence. But these problems are no longer in the public sphere and subject to public regulation, and they are no longer part of public anxiety.

The ICTs of the 1990s fail to live up to their promises as development aids, as was the case with the telephone, radio, satellites, and ICTs of earlier decades.

Cargo Cult

Assumptions

- The global community is inclusive and supportive.
- Most developing countries respond only partially and reactively to the acquisition and use of ICTs.

Faced with an onslaught of new services, all owned and marketed by the United States, the EU, or Japan, developing countries adopt the same helpless attitude

as did Melanesian people in the late 19th century. The arrival of foreign cargo symbolized the arrival of a new messianic age, inaugurating paradise. The natives gave up their indigenous working practices and stopped cultivating their fields. Some cargo cults were deliberately encouraged by Christian missionaries as part of a millennium drive and as a means of controlling native people. The cults were revived in the 1930s and some continue in the 1990s. Why might this happen with ICTs?

The scenario begins in the same way as *The March of Follies*. The late 1990s sees an explosion of infrastructure, dominated by a few US and EU companies that can arrange cheap finance and that own patents in the dominant software and technologies. Issues of equity and access are hardly considered. Technical specifications and standards are almost entirely determined by OECD governments and corporations, and by the intergovernmental organizations that they finance and dominate. Developing countries have little input.

The emergence of a strong international community prevents a slide into *The March of Follies* scenario. The UN and its agencies make new links with the private sector. An agency called Greenbyte is spun off from Greenpeace to fight for equity in the electronic commons. Another organization called Netquity brings together a coalition of nongovernmental organizations

(NGOs), private corporations, and government agencies, with support from the World Bank and the ITU Development Fund. Global corporations see the advantages of providing wider access and cooperate with developing countries to develop infrastructure (the experience in debt restructuring may be of some relevance here).

By 2005, all countries have access to an effective global network. However, although the local access provider might have a local name, its language, user interface, menu, guide, smart agent, and search agent are usually devised, owned, and managed by foreign companies. Some corporations look for local companies to originate local user interfaces, but they often do not exist. The talented young people who want to work in software development are forced, because of the lack of local training schemes and local opportunities, to go to the USA, Europe, or Singapore. There is a very significant outflow of skilled workers from developing countries to OECD countries and the newly industrialized countries (NICs). In their absence, Northern companies sell systems based on Northern assumptions and do not attempt, or know how, to adapt them to the aspirations and needs of developing countries. There is a lack of local translators and adaptors. The small-scale dumping seen under *The March of Follies* grows in scale and becomes big business.

Some innovative solutions are developed. For example, one country uses the principle of "planning gain" to sell its mineral rights to an international consortium on the condition that the consortium wires up the entire population. But the country's failure to train people to produce software content means that most of the content comes from outside, and, in the end, the consortium simply gains an infrastructure asset even more profitable than its original mining rights.

The UN is restructured and takes a lead role in promoting the "universalization of access" to the "global communications commons," and in coordinating government policies and international agreements. The World Bank and regional development banks establish special funds for infrastructure projects that are used by some developing countries to leverage corporate finance in the financial markets of the USA, Europe, and Japan.

As a condition of their loans, these agencies require governments to introduce bit taxes along the lines of spectrum taxes. But many governments set up enterprise zones that are free of bit taxes to attract international corporations. As a result, the developing world fails to capture the potential benefits of bit taxes, as it had earlier failed to benefit from spectrum rent.

By 2010 the *Cargo Cult* mentality prevails. Most national governments not only lack financial resources and know-how but also political will. Having a

national computing centre, like having a national airline and a national satellite system, is a matter of national pride, if in reality a loss to the treasury. Computers symbolize the new religion; even if they do not work well or have any useful software. Every country has a national campaign to put computers in schools, but many fail to train the teachers to operate the computers and some put computers in schools that do not have any electricity or connectivity. Very few education officials have the skills that are needed.

Countries that do adopt national policies mostly aim to replicate the import substitution strategies that had been popular in the 1950s, 1960s, and 1970s. Information and communications policies are given a high profile for a few years; but, when they fail to deliver goods and services that could compete with foreign products, they are abandoned.

The result is widespread frustration. The dreams of the 20th century, which had solidified into almost a religion, fade away. By adopting an uncritical approach, most countries gain access at the expense of substance. They can buy other countries' information; but they cannot generate their own. They fail to make the connection between information and development. They receive information and they expect to receive development, without working to make development in their own image.

Netblocs

Assumptions

- The global system is exclusive and fragmented.
- Developing countries take an active approach to the acquisition and use of ICTs and develop a complete set of policies.

As a result of the spread of ICTs, many people become wired into the new global information society. Groups emerge, based on shared cultures and languages, initially in the towns and then spreading further afield. Each has its own decided and inventive approach to information and communication.

The groups, or blocs, emerge for a variety of reasons. The sheer size and growth of the ICT industry push it to the top of the world's agenda. The notion of the information economy and the creative economy takes hold. The existence of relatively cheap broadband networks allow people to communicate and transact with their peers all over the world (although most users are initially young people).

The OECD countries constitute one bloc. They maintain leadership in many dominant areas, such as banking, network management, software development, branded goods, and entertainment.

Some of the NICs of Asia form a bloc. The countries on the Indian Ocean Rim — South Africa, the Gulf

States, India, Malaysia, and Singapore — form another bloc on the basis of their shared religions and ancient trading routes. The African Information Society Initiative and a series of conferences and events that followed the Information Society and Development Conference held in South Africa provide useful platforms. The francophone countries form a bloc. Latin America forms a bloc, fed by its own political tradition, cultures, and languages. Other blocs are based on Islam and on the Chinese script. Some countries waver between two blocs. Russia asserts its power over the former Asian republics of the USSR. Eastern Europe continues to have association agreements with the EU, but relishes its independent leverage as a major trader between the EU and Russia.

As the scenario unfolds, each bloc establishes a strong position by virtue of its sheer size, common culture, the business skills of its young entrepreneurs, and highly focused specialization. India specializes in software design and development. Singapore specializes in electronic funds transfer and commerce.

The blocs are competitive and divisive, both against the OECD and against each other. By 2005, many blocs set up regional intranets, closed and often censored. The global environment breaks down into countervailing zones of exclusion. The poor in each bloc, who are very heterogeneous, threaten the

composition of each of the blocs and of the relationships among them.

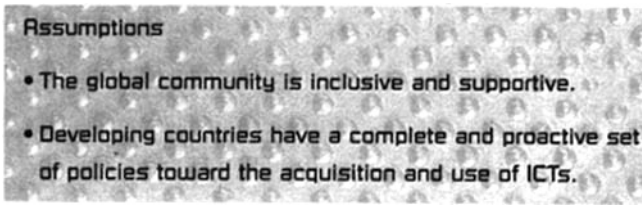
Not all countries join a bloc. Some developing countries lack resources. Some lack natural partners. Old ties based on physical proximity tend to weaken as more business is done electronically (the end of geopolitics).

After a few more years, one of the major Southern blocs makes a proposal to tax information, by means of taxes on spectrum and bits, and to use the revenues for public benefit. It persuades the UN General Assembly to study various options. When the resolution is passed, the USA and other countries withdraw from the UN. Another attempt to introduce global policy also rebounds when the EU and the USA agree to a new copyright regime for the information age under the auspices of the World Intellectual Property Organization and set up a joint collecting society and a system of digital watermarking. The effects on some developing societies is devastating. China withdraws. As a result, the UN system becomes enfeebled, and the global consensus, already fragile, breaks down.

At the end of the scenario period, the blocs have achieved much. They have created information societies and economies that reflect their own histories, traditions, cultures, and ways of doing business. But their insistence on their own regional laws,

regulations, and trading principles creates centripetal forces that lead to a highly unstable situation.

Networld



It begins, as do the other scenarios, with the rapid spread of technologies and services, driven by OECD values, shareholders, IPR principles, brands, and deals. The OECD attitude toward the developing countries is ambivalent. They find some of the restrictive national policies (such as on the ownership of media) as intensely irritating.

By 2000, many corporations realize that the successful sale of a few international brands (such as for televisions, food, and clothes) to young urban elites has not produced a broad consumer base, or generated much domestic wealth. Markets for other goods and services are also very small.

These companies begin to realize the extent of their failure. Facing saturated markets at home, they want to reach new consumers. They do not wish to be shut out of new markets. There is strong evidence of enlightened self-interest as they seek ways of working

with companies and institutions in the developing world. They regard *Netblocs* as harmful, creating tariff and nontariff barriers to trade and allowing regional competitors to emerge. They take the initiative to lobby their governments to dismantle these trade barriers.

Their awareness is matched by a realization in developing countries that they should work with global corporations to create their own national information society and economy. They cannot go it alone.

A diplomatic conference on copyright produces a new convention that requires global assent. The OECD countries want to sign. The developing countries agree to sign if WTO amends its trade rules. An agreement is drafted that provides a win–win solution. The negotiations are assisted by the development of translation software. By allowing free testing and practically free individual usage, the software becomes widespread and allows speakers of many languages to take part in the debate.

Faced with these developments, many developing governments take a more positive stance toward ICTs and their use for social and economic development.

Some countries take an even bolder step. Instead of wondering how ICTs can support their existing development policies, they decide to treat ICTs — or, rather, information and communications — as the starting

point for development. This novel approach opens the floodgates to a whole new set of policies. It also enables the developing countries to talk on equal terms with the OECD countries.

The principles of equity, open access, and fair accounting that dominate telecommunications policy become the new management fashion. They set the tone in other sectors including education and health care.

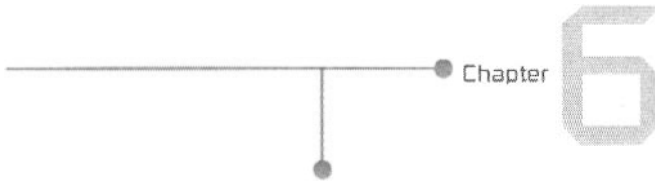
Around 2005, the major intergovernmental organizations seek new agendas, new missions, and new sources of revenue. They invite NGOs to be members, thus acquiring new authority, new ideas, and new sources of revenue. The NGOs thus have a larger role to play than they do, for example, in the *Cargo Cult* scenario, to everyone's benefit.

International organizations seize the moment to launch some imaginative projects. One is the establishment of a network of six "tele-towns" chosen against three criteria: social and economic relevance, cultural distinctiveness, and media potential. The sites are financed by private corporations with matching funds from international organizations. There is considerable competition around the world to host one of these towns.

Intellectual property becomes a big issue. Politicians, executives, as well as lawyers, begin to understand

IPRs. As a result, they become more flexible and creative in their use of copyright. This enables countries that had problems with copyright to stay within the international copyright conventions.

At the end of the scenario period, poverty and deprivation still remain. But the international system is not only supportive but also knowledgeable. National governments and the private sector, acting both locally and through intergovernmental organizations, work in tandem more often than not.



Conclusions

As a result of the Kelburn Workshop, and arising from the process and the scenarios themselves, the following conclusions emerged:

- The key uncertainties in development and ICTs are the global community itself and national responses and policies. The global system ranges from being inclusive to exclusive. National governments range from being responsive to unresponsive, and their policies from being complete to partial, proactive to reactive.

- Whether or not there is a more open, inclusive global environment, it is in the interests of both North and South to have active, learning-based policy responses. In the terms of the scenarios, it is better to be in *Networld* or *Netblocs* than in *Cargo Cult* or *The March of Follies*.

- Similarly, whether or not countries do formulate complete and proactive policies, it is in everyone's interests to move toward a more inclusive global system: *Cargo Cult* is better than *The March of Follies*, and *Networld* is better than *Netblocs*.

- The scenario-planning process does not involve a judgement about which scenario is most likely. However, the participants, in their capacity as experts and policymakers, believed that *The March of Follies* had many symptoms of current reality. *Cargo Cult* may occur. *Netblocs* may emerge, and may exist for a considerable period. *Networld* is desirable, but its causes and the circumstances that might lead to it coming into existence are fuzzy.

- The future of ICTs is uncertain, but these uncertainties do not justify a "do-nothing" policy. Each country has a clear priority: to create an information society and an information economy that reflects its culture and needs, while being able to choose its optimal role in the global community. Creating the information society is more important than using any specific technology. Governments can act immediately in some areas (such as on issues of access for its citizens), although other areas are more problematic and complex (such as issues of impact). Developing countries should, thus, enhance the national capacity to learn, identify areas where policy is appropriate, take appropriate

action, and take an active part in developing the global information society.

- While governments have long been dominant in setting development goals, ICTs are driven by the private sector. Developing countries should establish appropriate relationships with global and local companies, for both short-term and long-term development agendas.

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Afterword

The principal objective of the Kelburn Workshop was to build a common understanding among the participants of the complexities facing developing-country governments as each seeks to formulate policies for accessing and using ICTs for development objectives. Many of the participants in Kelburn were members of the UNCSTD Working Group on IT and Development and were required to formulate recommendations to national governments. It was anticipated that this task would be easier if the members of the working group shared the same mental map.

Subsequent to the Kelburn Workshop, the UNCSTD Working Group reviewed some 60 reports that had been commissioned on different aspects of ICT and development and at a further workshop in Lonavia, India, prepared their report and submitted it to the Commission in May 1997. Their report reviews the evidence and makes recommendations for action. In

developing their recommendations, the members of the working group were influenced by their strong personal wish to see the world move more toward the *Networld* scenario, although they did recognize that, within the next 10 to 15 years, the *Netblocs* scenario was more likely. Without the Kelburn Workshop, the choices would have been less clear and the recommendations less focused. The scenarios helped provide a framework within which the commissioned papers could be viewed and conclusions reached.

Finally, the May meeting endorsed a set of recommendations addressed to national governments and the UN system. They have now been sent to the Economic and Social Council of the UN for consideration and subsequent action.

Fernando Chaparro (Colombia)
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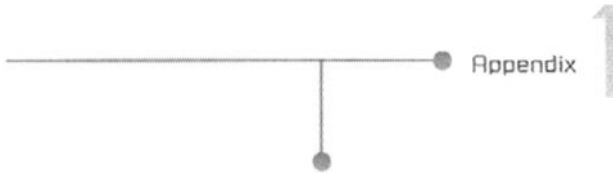
Co-chairs, UNCSTD Working Group on IT and Development



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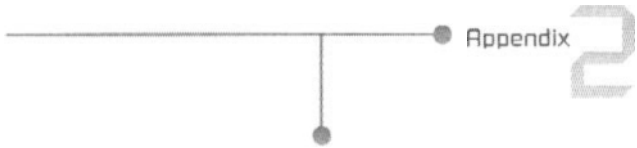

Objectives of the UNCSTD Working Group on IT and Development

1. To provide a policy-oriented synthesis of current initiatives in information technology and development, identifying common concerns and approaches, so as to lead to national and regional recommendations.

2. To place ICT policy research on the international research and political agendas, and to ensure that developing countries and economies in transition can develop their capacities for policy analysis and assessment in this area so they can participate in setting, researching, and carrying out these agendas.

3. To provide an overview to policymakers of trends in ICTs and their current and potential social,

economic, political, and cultural impacts on development, and to elucidate the positive and negative aspects of these trends and impacts, and the corresponding opportunities and challenges.

4. To raise awareness within the international community and national governments of the increasingly important role of ICTs in development and to identify the issues that must be addressed to ensure equitable access to, and use of, ICTs by developing countries and economies in transition.

5. To seek means of promoting interesting initiatives in the developing world, oriented at facilitating access to ICTs and at promoting applications of ICTs to support development efforts.

6. To identify and assess the current involvement of the UN system with respect to ICTs and development and to make appropriate recommendations.

Acronyms and Abbreviations

EU	European Union
ICT	information and communication technology
IDRC	International Development Resarch Centre
IPRs	intellectual property rights
ITU	International Telecommunication Union
NIC	newly industrialized country
NGO	nongovernmental organization
OECD	Organization for Economic Co-operation and Development
R&D	research and development
UN	United Nations
UNCSTD	United Nations Commission on Science and Technology for Development
WTO	World Trade Organization

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John Howkins has specialized in television and communications for the past 25 years, including 15 years as senior advisor to Time Warner Inc. in Europe, responsible for strategic planning, new technologies, new markets, and business opportunities. From 1985 to 1990, he was Executive Director of the International Institute of Communications (IIC) and led IIC's analysis of global developments in broadcasting and telecommunications. Mr Howkins is currently project director of the World Learning Network, deputy chairman of the British Screen Advisory Council, and UK representative of the Transatlantic Dialogue on Broadcasting and the Information Society.

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The **United Nations Commission on Science and Technology for Development** (UNCSTD) was established in 1992 by the General Assembly of the United Nations and, since 1993, has been serviced by the UNCTAD secretariat. Through assembled panels of experts, the Commission examines and provides advice on current issues in science and technology, with a focus on the developing world. The Commission's Working Group on IT and Development was convened to explore the development challenges of the ongoing Information Revolution.