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**THE CHALLENGES OF THE INFORMATION HIGHWAYS:
THE ROLE OF UNESCO**

SUMMARY

During the debate of the Executive Board at its 149th session on 'Questions relating to Information and Communication for Development' (agenda item 7.1.2), several Board Members requested further information on UNESCO's activities to meet the challenges of the information highways. The Director-General, having proposed this item for discussion at the 150th session of the Board, submits the present document intended to inform the Board about the action undertaken by the Secretariat to place UNESCO at the forefront of the international debate on this important subject. The Board's advice is also sought on future orientations, with particular reference to the convening of a UNESCO conference on Information and Communication for Development in 1998 and to the proposed role of UNESCO in the formulation of a body of principles applicable to cyberspace.

Decision required: paragraph 27.

I. CHALLENGES OF THE INFORMATION AND COMMUNICATION TECHNOLOGIES

1. Under its Constitution, UNESCO is required to contribute to '*advancing the mutual knowledge and understanding of peoples, through all means of mass communication*', '*to promote the free flow of ideas by word and image*', to '*maintain, increase and diffuse knowledge*', and to '*give fresh impulse to popular education and to the spread of culture*'.
2. With the advent of the information age, these tasks have not only retained their relevance but have taken on a new urgency, and concrete ways to carry them out will need to be adapted to the new technological environment. The distinction between different forms of information is less and less clear and the principle of the 'free flow of information' - which until recently had been considered primarily in terms of various mass media - must now be applied to all types of information relevant to the advancement of education, science, culture, peace and democracy.
3. Once accessible to all - irrespective of race, nationality, gender, location, occupation or social status - information and communication technologies can be instrumental for achieving a truly human-centred development. It is true that, for the present, economic and commercial interests seem to be the main driving force for the building of information highways. However, it is also obvious that the development of culture, education and science, as distinct and integral parts of our civilization, cannot be left totally to market forces. Information highways must not simply provide new and more powerful electronic channels for consumption. They must provide large spaces for knowledge and value sharing, artistic creation and public debate. Just as the existing media do, new electronic networks must transmit the widest possible variety of opinions, together with information which may not be commercially profitable, or may interest only minority groups. It is therefore of the utmost importance to reaffirm one of the missions of public service media which is to meet basic educational, scientific and cultural needs of people in the new technological environment.
4. The concept of universal service and how a 'right to communicate' will evolve in a digital world where the basic services required by all citizens are becoming more extensive and complex is central to this challenge. Access in this context implies not only physical availability and affordable cost, but also ensuring that the user can benefit from the services concerned, through a minimum level of 'digital literacy' and through appropriately adapted interfaces. In the increasingly competitive and commercial world of information and communication, the risks of exclusion of disadvantaged populations are substantial - both within and among societies. These risks are of particular concern to the developing countries, which need clear and resourceful policies, if they are to benefit from the emerging communication and information revolution.
5. One aspect of the 'right to communicate' concerns access to telematics facilities at affordable cost by the 'intellectual' sectors. This is of the greatest importance because education, science, culture and communication media, libraries and archives have a crucial role to play in the development of national information infrastructures. Access must, however, take into account the right of creators and producers of intellectual works to protection against unauthorized distribution or modification which are becoming easier in a digital world.
6. Another important issue is the maintenance of linguistic and cultural diversity in the Information Society. Globalization, brought by technological advances, is seen by many as a threat to local customs, values and beliefs. One example frequently given is that a great majority of the data on the Internet are in English, and that the principal 'browser' software widely used to access data cannot even read non-Roman scripts. Nevertheless, technology also provides opportunities for the development of specialized services to cater for diverse cultural needs and there is every reason

to suppose that such services will flourish where legitimate cultural, educational or scientific demands exist. These advantages are, however, counterbalanced by a danger that these groups of media users may prefer cultural specificity to diversity and dialogue, and thus run the risk of shutting themselves into a cultural ghetto. At the same time, it must be kept in mind that many small- or even medium-sized countries do not have the critical mass, in either economic or demographic terms, to guarantee adequate national content and may thus largely depend on imported programmes and services. The rapid development of broadcasting technology and its convergence with computing and telecommunication give this issue a new complexity.

7. Increased access to interconnected networks and data bases also raises ethical and legal issues. Among these are the privacy of information and the right of individuals to check personal data, which is widely recognized as a fundamental human right. The regulation of information of an intolerant, racist, violent or pornographic nature circulating through information highways, and particularly its access by children, is also of great concern. Computer piracy and other informatics crimes are on the increase and in the area of copyright legitimate intellectual property protection would have to be extended to cover the rapidly changing multimedia digital environment. At the same time, access to information needed to promote social and economic development must be maintained. Governments may wish to evaluate very carefully the advantages and disadvantages of any measure they might consider taking in these matters. It may be that other solutions involving, for example, consumer action or voluntary codes of conduct drawn up by information professionals, may prove to be the most effective. This issue is not fundamentally altered by the fact that information technologies themselves are providing partial solutions to these problems.

8. Finally, the effects of computer technology on individuals and their social behaviour are controversial. On a computer today, it is possible to study, work, shop, watch a film, talk to a friend, visit a library or a museum, read a newspaper or play games. This provides immense opportunities for access, but it can also unduly privilege the 'human-machine' relationship to the detriment of reflection, self-reliance and personal capacity-building. At a wider level, the emerging information highways constitute an important factor in major social transformations, such as the internationalization of trade and the development of a world economic market, the globalization of news and personal communication, and changes in job opportunities and working conditions. Information highways are also creating new forms of cultural communication in which virtual communities can reorganize cultural dialogues in a borderless world, overriding some of the traditional roles of institutions and governments. The risks and opportunities associated with many of these phenomena are poorly understood, and deeper scientific analysis will be needed before they can be adequately considered by policy-makers.

II. FRAMEWORK FOR ACTION

9. These tendencies and challenges were fully considered by UNESCO when the Medium-Term Strategy (28 C/4) and the Programme and Budget for 1996-1997 (28 C/5) were prepared. It should also be recalled that the Secretariat prepared a document to serve as a basis for discussions at the joint meeting of the Programme Commissions on 'Educational, scientific and cultural challenges of the new communication and information technologies' at the twenty-eighth session of the General Conference.

10. The General Conference, having examined the draft 28 C/4 and 28 C/5 documents and the relevant recommendations of the Executive Board, adopted 28 C/Resolution 15 which stressed the societal problems of information technologies and potential dangers of information highways to developing nations and invited the Director-General:

- ‘(a) to ensure that in the final version of the Medium-Term Strategy for 1996-2001 attention is drawn to the rapid development of the new communication technologies in such a way as to prompt interdisciplinary and intersectoral reflection on these technologies as a factor of development, and to revise document 28 C/5 accordingly;
- (b) to initiate in parallel therewith a wide-ranging discussion of the consequences of the development of such technologies for UNESCO's programmes in order to ensure that the Organization is able to anticipate and adapt to these changes for 1996-1997 on the basis of regional consultations;
- (c) to promote an ethical approach in keeping with UNESCO's ethical mission and aimed at achieving harmonious development of these technologies while ensuring respect for linguistic and cultural pluralism and for the right of privacy;
- (d) to take steps, beginning in the current biennium, to elaborate, together with the various partners concerned, specific and carefully monitored projects, in particular in the fields of distance education and virtual libraries’.

11. Immediately after the General Conference, further guidance on UNESCO's role was provided by the Director-General's Group on Information and Communication Technologies. Meeting for the first time in December 1995, the eminent Members of this high-level group emphasized UNESCO's competence to play a leading role in this field both within the United Nations system and worldwide.

12. Taking account of the directives of UNESCO's governing bodies and of the results of the consultative process, the Director-General recently took the following measures:

- In April 1996 the co-ordination of UNESCO's activities in the area of information and communication technologies was strengthened through the establishment of a new Information and Informatics Division within the Communication, Information and Informatics Sector, providing the secretariat for both the General Information Programme (PGI) and the Intergovernmental Informatics Programme (IIP). In view of the growing importance of telematics - the convergence of telecommunication and informatics to provide a whole range of new services and facilities based on digital technologies - a ‘Telematics Unit’ was created within this division to carry out activities within this field and to develop interdisciplinary pilot projects with other units concerned in the Secretariat.
- In May 1996 a document on the challenges of the information highways and the role of UNESCO, entitled ‘UNESCO and an Information Society for All’* (CII-96/WS/4 - reproduced as Annex) was finalized and published in order to present the strategy of the Organization in this area to Member States, decision-makers and to the public.

13. The conceptual framework reflected in UNESCO's current Medium-Term Strategy and biennial programme and budget foresees that the Organization, in collaboration with the United Nations system and the international community at large, will:

* This document provides more detailed information to the summarized version provided here.

as part of its international intellectual co-operation function,

- encourage and facilitate the analysis of the societal impacts of communication and information technologies;
- contribute to the conception and promotion of international policies for the development of information highways, destined to embrace the developing countries in the Information Society and to avoid new types of exclusion within nations due to economic or other barriers;
- facilitate international debate on the human rights issues of the coming information age, including the rights to information access and to information privacy;
- promote international reflection on major ethical and cultural issues concerning information highways, including those related to content, in particular its cognitive dimension;
- participate in the process of reviewing copyright and intellectual property conventions to ensure that they remain relevant and effective in the emerging information society;
- catalyse reflection on the issue of artistic integrity and moral rights which are endangered by new technological possibilities for distortion and for distribution of distorted works;
- encourage the development and dissemination of methods for handling and accessing information in the fields of education, science, culture and communication;
- reaffirm the mission of the public service media to meet the very basic educational, scientific and cultural needs of people in the new technological environment;

and, as part of its technical assistance function,

- assist Member States in elaborating national policies and regional strategies for optimum use of and access to information through modern technology, and in creating conditions conducive to the development of electronic cultural industries;
- encourage, for example through pilot projects and training, the use of information networks and innovative multimedia technologies to foster development in the Organization's fields of competence, in particular as regards:
 - promote the free flow of information in the fields of education, science, culture and communication, and the new role of libraries, especially public libraries, as gateways to electronic information;
 - distance education and innovative approaches to non-formal and lifelong education and learning;
 - virtual scientific laboratories, in which researchers from developing and developed countries can collaborate through telecommunications and telematics on common projects;
 - production and dissemination of diverse cultural products as a contribution to intercultural understanding and dialogue.

III. UNESCO's CURRENT AND PLANNED ACTIVITIES CONCERNING INFORMATION HIGHWAYS

14. This section provides a review of recently completed, ongoing and future UNESCO activities designed to respond to the challenge of the information highways. They are grouped within the three principal areas of action identified in the UNESCO document. This enumeration is not intended to be comprehensive, but rather to emphasize innovative, interdisciplinary and intersectoral applications of information and communication technologies.

A. Societal impacts

- On the basis of the Co-operation Agreement between the two Organizations signed in October 1992, UNESCO collaborates closely with the International Telecommunication Union (ITU) in this area. A study carried out jointly and entitled 'The Right to Communicate - At What Price?: Economic Constraints to the Effective Use of Telecommunications in Education, Science, Culture and in the Circulation of Information' (UNESCO/CII-95/WS/2), presents a number of strategies and recommendations. These constitute a promising approach to the question of ensuring access to telematics facilities at affordable cost to users in development-oriented sectors. This study inspired parts of ITU's 'Buenos Aires Action Plan' adopted by the World Telecommunication Development Conference - WTDC/94 (Buenos Aires, March 1994).
- As a follow-up to the meeting in Buenos Aires, UNESCO is co-operating with the *Study Groups set up by the ITU Development Sector* to formulate recommendations to strengthen the role of telecommunications and broadcasting in development. UNESCO is also participating in the preparation by the *United Nations Commission on Science and Technology for Development (UNCSTD)* of a policy report on 'Information Technology and Development' for consideration by Member States and organizations of the United Nations system. Inputs to these international reflections draw specifically on the results of UNESCO's own activity in these areas.
- The Culture Sector organized, with technical support from the Communication, Information and Informatics (CII) Sector the *International UNESCO Symposium on Copyright in the Information Society* (Madrid, March 1996), which was convened in co-operation with the Spanish Government. Among other things, the meeting discussed the creation, dissemination and use of electronic works, with particular attention to the challenges of ensuring access by the public to such works, while protecting the moral and economic rights of their creators and producers.

In the field of technology, the Symposium concluded that developing countries face particular problems in setting up the basic infrastructures of communication. International support was required to enable them to design their own strategy in this field and to establish progressively appropriate infrastructures providing access to both information and knowledge.

As for copyright, the growing convergence of technologies is creating an increasing number of problems concerning the protection for intellectual works. They require urgent solutions in order to address legal uncertainties that may otherwise hamper the sound development of the global information infrastructure.

Existing legislation for copyright and neighbouring rights established for an analogical environment is not always applicable. It needs to be adapted in several major areas such as

the definition of protected acts in order to take account of the digital transmission, ways and means to respect moral rights, a thorough revision of exempted uses and effective mechanisms of copyright management.

- As a follow-up to the Madrid meeting, a series of regional expert meetings (Bogotá and New Delhi in 1996 for Latin America and the Caribbean and Asia and the Pacific, and for Africa and Europe in 1997) is foreseen to develop practical recommendations on intellectual property rights and on the organization of cultural industries at the national level.
- UNESCO is organizing in co-operation with the French and German National Commissions and International Congress on Ethical, Legal and Societal Aspects of Digital Information - INFO-ETHICS - in France from 10 to 12 March 1997. The objective of the Congress is to reaffirm the importance of universal access to information and to examine ways in which it may be achieved and maintained in the global information infrastructures. The Congress programme includes three main themes: Access to digital information with issues such as access to information superhighways, copyright and fair use, multilingualism and cultural diversity, security and freedom of information; The preservation of digital information and records including their archiving, reliability, accountability and legal requirements for long-term preservation; The preparation of our societies for the multimedia environment including such questions as digital literacy, learning and responsibilities.
- A World Forum on the *Protection of Folklore*, to be held in Phuket, Thailand in April 1997 in conjunction with WIPO, will consider the role of information and communication technologies in protecting and promoting intangible heritage for cultural development and intercultural exchange.
- UNESCO is actively participating in the preparatory work for the *Diplomatic Conference* convened by WIPO in December 1996 to adapt intellectual property legislation to the information age by adopting a new Protocol to the Berne Convention and possibly a new instrument to upgrade the protection of performers and phonogram producers. Efforts have centred on preparing consensus on a balance between the interests of authors and producers, copyright owners and public interest, and copyright exporters and importers through participation in major specialized consultations such as that of the European Commission on Copyright and Related Rights on the Threshold of the XXIst Century (June 1995) and the Intellectual Property Conference of the Americas (July 1996).
- The Second International Congress on *Education and Informatics* (Moscow, July 1996) provided a forum for discussion on the challenges, potential benefits and strategies concerning educational technologies and on UNESCO's future orientations and action in this area.
- UNESCO participated in the *Information Society and Development (ISAD)* Conference (Midrand, South Africa, 13-15 May 1996) with a delegation led by the Assistant Director-General for Communication, Information and Informatics and including the Chairpersons of the IPDC and PGI Councils and staff of the Culture and Education Sectors. It is envisaged that the Organization will be closely involved in the follow-up to ISAD, which is expected to promote dialogue between industrialized and developing countries through a series of meetings and pilot projects.
- The 1996-1997 programme foresees the promotion of an international *electronic observatory* covering communication research results and innovations on the use of technologies in the media, newspaper publishing and information services and products.

This work will build on the other efforts underway to provide an international forum for interdisciplinary and intersectoral reflection on the impact of communication and information technologies in UNESCO's fields of competence: e.g. the ORBICOM network of UNESCO Chairs in Communication, and the World Communication Report and World Information Report which are both in preparation.

B. National policies and regional strategies

- The *African Regional Symposium on Telematics for Development* was organized in Addis Ababa in April 1995 by ITU, the United Nations Economic Commission for Africa (UNECA), UNESCO and the International Development Research Centre (Canada). This Symposium brought together more than a hundred specialists from actual and potential telematics user organizations, service providers, telecommunication operators, and concerned government agencies as well as representatives of about 20 regional, international and bilateral agencies active in co-operation in this field in Africa. It formulated a number of national and regional strategies which were endorsed in May 1995 by the ECA Conference of Ministers Responsible for Economic and Social Development and Planning.

Following the Ministers, UNECA, with the collaboration and support of the other sponsors of the Symposium, established a High-Level Working Group on Information and Communication Technologies in Africa which prepared a regional action framework called the African Information Society Initiative (AISI) which was approved by the ECA Conference of Ministers meeting in May 1996. At the international level, planning and fund raising are underway for a \$11.5 million programme entitled 'Harnessing Information Technology for Development' - led by UNECA, the World Bank, UNESCO, ITU and UNCTAD - to help 'kickstart' the AISI as part of the United Nations System-wide Special Initiative on Africa.

- Symposia on telematics for development are planned for the Arab States in 1996 and for Latin America and the Caribbean in 1997 in conjunction with other concerned regional and international organizations.
- The Commission of the European Communities (CEC) and UNESCO launched the *STACCIS* (Support for Telematics Applications Co-operation with the Commonwealth of Independent States) project in June 1996. STACCIS, which has received funding of 400,000 ECU (more than \$500,000) through the Telematics Applications Programme of the CEC for a period of three years, will promote regional development and East-West co-operation on telematics applications in the key areas of research, education and environment.

C. Applications and pilot projects

- The Regional Informatics Network for Africa (RINAF) project of UNESCO's Intergovernmental Informatics Programme (IIP), which has mobilized more than \$1 million from several bilateral funding agencies, notably the Government of Italy, and has already organized several training courses for African network managers and technicians and helped to connect four African countries to the Internet. A strategy meeting and training course were organized in Libreville in April 1996 to plan activities to extend network connectivity to the Central African subregion. A model information highway project has been initiated in *Ghana* under the sponsorship of IDRC, ITU, UNECA and UNESCO.
- *A Pilot Project on Access to Telematics Services in the Caribbean* was launched in February 1996 under the sponsorship of the Commonwealth of Learning (COL), the International

Council for Scientific and Technical Information (ICSTI), ITU, the Pan- American Health Organization (PAHO), UNDP and UNESCO. The project, which will last about 18 months, intends to build sustainable use of scientific and technical information for development through the Internet in Barbados, Saint Lucia, and Saint Vincent and the Grenadines.

- A study on 'The Use of Electronic Information Technologies in Open and Distance Education' was undertaken as a basis for the section on educational technology within the 'Policy Paper on Open and Distance Learning' prepared for UNESCO by the International Council on Distance Education (ICDE) and for discussions on UNESCO action in this area which took place in a Consultation on Distance Education and Information Technologies (UNESCO, September 1994). An International Conference on Electronics Information Technology in Distance Education in the nine most populous developing (DE9) countries was organized in Delhi in January 1996, and a pilot data base on the use of electronic media in distance and open learning has been completed.

Methodological support on educational technologies has been provided in the context of Learning without Frontiers (LWF) to several Member States including Egypt and South Africa, and to LWF pilot projects in Costa Rica, India and Mauritius.

A series of UNESCO-ITU pilot projects on Educational Application of Interactive Television is being implemented in India, Mexico and Morocco. These joint projects are designed to test whether this technology can be affordable and appropriate for educational applications in developing countries, and to provide feedback to the ITU standardization process in this area.

- The needs of the international scientific community concerning information highways have been elicited through the first meeting of the International Advisory Council on Global Scientific Communications - ACOSC (September 1995) and the ICSU-UNESCO Conference of Experts on Electronic Publishing in Science (February 1996) which recommended that UNESCO contribute to the elaboration of a code of conduct for electronic, scholarly scientific publishing and to pilot projects for the establishment of electronic journals in developing countries. The Physics Action Council (PAC) has organized with UNESCO support network training programmes in Ukraine and the Russian Federation, as well as several regional network strategy consultations for scientists. Networking co-operation is also underway in the area of environment, particularly within the Intergovernmental Oceanographic Commission and the Man and the Biosphere programme.
- The Management of Social Transformations (MOST) Programme has established a Clearing House to facilitate the exchange of information and the co-operation of researchers and policy-makers. The Clearing House has already provided support to interconnect four participating institutions, with a view to gradually connecting all research teams in 60 countries. Discussion groups and data bases have been made available over the Internet, and an international tele-workshop on the MOST Clearing House was organized in 1996 under the aegis of the International Committee for Social Science Information and Documentation (ICSSD). Guidelines on the sharing of electronic research data have been prepared in co-operation with the International Federation of Data Organizations (IFDO) and ICSSD.
- UNESCO is conducting with the European Community a joint study on the cultural contents of audio-visual and multimedia productions with a view to identifying development strategies for endogenous audio-visual industries in the digital environment. In partnership with a research institution in the Republic of Korea, standard indicators of consumption of

cultural goods are being developed to measure national patterns and identify shifts resulting from the globalization of communication technologies.

- Two international expert meetings have been organized on space archaeology and a co-operative research programme to study archaeological sites instituted with the space agencies of France, Japan and the United States. The programme of production of CD-ROMs on ancient civilizations and cultural heritage sites is being expanded to include access through the Internet and experiments in virtual reality. A World Heritage Information Network is being developed with UNESCO support.
- The Asia and Pacific Regional Seminar on Information Technology for Newspaper Publishing, held in Madras, India in 1995, made recommendations on how small- and medium-sized newspapers in the region can better apply communication, information and informatics technologies taking full account of social and cultural factors such as the need to adapt technologies to the national or local languages.
- The FEMMED-WOMMED Network, formed under UNESCO auspices in 1995, to facilitate balanced access to expression and decision-making in the media irrespective of gender, is making extensive use of the Internet to promote and develop its work.
- A training course on use of the Internet by journalists was organized with UNESCO support at the Symposium on Information Superhighways: What Strategy for Africa? (Dakar, December 1995). Collaboration is underway with the Pan-African News Agency (PANA) in the development of its African Network for Integration and Development (RAPIDE) which will build on co-operation among public and private media and information services in the region to provide news, market data and legal, administrative and cultural information through the Internet in order to promote investment, commerce and development.
- A project proposed for DANIDA and ITU financing envisages the establishment of pilot programmes in five African countries on mobilization and upgrading of information professionals and community library and information centres to providing multiple development-oriented services, making use of appropriate electronic technologies. In Asia and the Pacific, UNESCO's work on rural Community Learning and Resource Centres (CLARCs) will be extended to make appropriate use of information and communication technologies through pilot projects in Bhutan and Viet Nam. The basis for these activities was discussed at a seminar on Empowering Communities in the Information Society (South Africa, May 1996) organized with UNESCO support to coincide with the ISAD Conference.
- Memory of the World, the Network of Schools of Library and Information Science (SLISNET), the Records and Archives Management Programme (RAMP) and the regional networks for resource sharing and information exchange are increasingly basing their work on the use of information highways as the digital libraries and digital archives come ever closer to reality.
- Regional co-ordination of training is being promoted in the Arab States and in Africa where UNESCO is working to promote the development of common curricula and international co-operative action for the training of planners and technical specialists in networking and application development, taking account of the roles of communication, information and informatics. Close operational links are being established in this context with other concerned international organizations such as ACCT, AUPELF-UREF, COL, the Internet Society, the ITU, Physics Action Council and UNITAR. A Subregional Arab Workshop organized by IIP in Cairo in March 1996 on 'Designing and Building an Information

Highway' is being followed up in training courses planned in Accra and Tunis in 1996 and in Bamako in early 1997.

IV. UNESCO CONFERENCE ON INFORMATION AND COMMUNICATION FOR DEVELOPMENT AND FORMULATION OF PRINCIPLES FOR CYBERSPACE

15. In order to reach the goals defined in the Medium-Term Strategy, UNESCO will have to play a pivotal role in the ongoing reflection on the global Information Society, concentrating more particularly in strategies and policies to ensure the participation of the developing countries and of civil society as a whole. Emphasis will continue to be placed on the role of information highways in development, and on promoting the use of the highways in development-oriented applications within UNESCO's fields of competence - such as, for example, virtual research groups, digital libraries, technology enhanced learning opportunities, government information systems, and community information and media centres.

16. A truly democratic global Information Society can be built only through the joint efforts of all nations and international organizations. In order to ensure the proper impact of its programme, UNESCO will work to strengthen mechanisms for the international exchange of information and experience on the contribution which information highways can make to development processes.

17. As a contribution to bringing together the various actors in this process, UNESCO has been co-operating with international and national partners in a programme of regional and international conferences designed to identify common policies and strategies and to lay a basis for collaborative action. Thus, the African Regional Symposium on Telematics for Development (Addis Ababa, 1995), will be followed by similar consultations for the Arab States and for Latin America and the Caribbean in 1996 and 1997 respectively. The Conference on Electronic Publishing in Science, organized with the International Council of Scientific Unions (Paris, February 1996), the International Symposium on Copyright and Communication in the Information Society (Madrid, March 1996), and the Second World Congress on Education and Informatics (Moscow, July 1996) will be followed by the International Congress on Ethical, Legal and Societal Aspects of Digital Information (France, 1997) and the World Forum on the Protection of Folklore.

18. These regional and thematic international fora are part of the worldwide consultative process which would be consolidated through a UNESCO conference on Communication and Information for Development to be held in 1998. This conference would focus on development issues to which information and communication can make a meaningful contribution and would provide a forum for all who wish to contribute to the search for international consensus in these matters.

19. The principal social effect of the revolution of the new information and communication technologies is the widening gap between information-haves and information-have-nots both within and among countries and regions. Positive action to halt this trend which runs the risk of becoming self-perpetuating is required. One major problem is that as certain countries and regions become more and more literate in accessing, and even more important, in mastering intellectually the information wealth, the less they will be able to reduce the gap with the information-have-nots. However this situation also has a very positive potential. Electronic media, with comparatively little investment, but a widespread and efficient provision of training reinforced by co-operation efforts, such as North-South and South-South twinning of institutions, can rapidly provide immense resources of learning, information, data-bases and on-line advice. The conference should

therefore focus on strategies and policies required at all levels, to ensure the proper participation of all who wish to do so in the information society.

20. At present, most of the information and culture on-line resources come from the developed world. It is of the utmost importance that other cultures and civilizations are given the opportunity to present and promote their own cultural and informational wealth on line. This is necessary not only for their own purposes, but also in order to contribute to maintaining and enriching our global cultural diversity and to increase their share of global exposure.

21. The Conference should also address obvious, but difficult, ethical questions such as the role of information providers in the new technology environment, the question of personal privacy and the freedom, reliability and accountability of information. A major objective of the Conference would therefore be to look into the new possibilities for international co-operation to harmonize approaches to social, cultural, legal and ethical issues, taking into account not only cultural diversity but also the diverse needs of both developing and developed countries. Possible components of such an agenda might include the establishment of an appropriate framework for monitoring successes and failures to achieve adequate information access, production and flow for development purposes and for ensuring full international exchange of experience in these matters, including the energy sources for a wider utilization of cyberspace everywhere. A further element might concern proposals for any modification, adaptation or development which might be required to enable existing international mechanisms or instruments to deal with the issues concerned.

22. The conference would be planned in consultation with other United Nations agencies and programmes, relevant international and non-governmental organizations and with the competent bodies in Member States. Particular attention would be paid to the role of the UNESCO National Commissions and non-governmental organizations, who would be invited to contribute to the preparation of the agenda and working papers and to propose participants. The possibility of co-organizing the conference jointly with other bodies within the United Nations system, such as ITU, would be actively explored.

23. In the period leading up to the conference, pilot projects reflecting cultural and social diversity in UNESCO's fields of competence would be developed in every region by UNESCO and other interested institutions. The conference would select and present the best of these and thus provide a showcase of excellence, including works of reference, that would illustrate the contributions which all societies have to make to the information age. Such a demonstration would also provide indications as to how commercial interests might be counterbalanced by consumer demand.

24. The debate on issues of freedom of expression, intellectual property, safety, privacy, equal access and jurisdiction on information highways has focused increasingly on appropriate legal frameworks, and recent conflicting situations all around the world are evidence that the law is increasingly at variance with computer-network technology. In the final document of their Conference held in UNESCO from 3-6 June 1996, the Inter-Parliamentary Union stated 'The Conference believes that UNESCO is a major forum to discuss the developments and challenges of the information highways. It recommends that UNESCO envisage establishing, under its auspices, an intergovernmental council on issues related to information highways on which all regions would be represented'.

25. In co-operation with other interested agencies including WIPO, WTO, ILO, ISO, ITU, UNICEF, OECD, the European Union and the Council of Europe, as well as the Hague International Court of Justice, UNESCO is at present preparing a publication designed to contribute to the international debate on Cyberspace Law within the framework of the United

Nations Decade for International Law. The principal aim is to foster discussion of an original doctrine on cyberspace, which goes beyond the multimedia aspects, by including more general principles of a legal and ethical nature. Issues such as freedom of expression and the interrelation of a series of free speech issues that have arisen in cyberspace, known as attribution, integrity, anonymity, autonomy and accountability, safety, morality and violence in the cyberspace will be studied. Particular attention will be paid to new proposals of law enforcement, privacy and encryption, equal access to cyberspace and the right to receive information reconciling impartiality and universal access, and exploring the basic role of international law and conflicts of law related to sovereignty, competition issues and labour law.

26. There is a close relationship between the information superhighways, cultural industries, intellectual property and the globalization of trade. For this reason, legal harmonization is required to promote the free flow of information and a worldwide circulation of cultural goods which reflect our cultural diversity and reflect different cultural and economic backgrounds. As the specialized intellectual agency of the United Nations system, UNESCO is a natural forum for consensus-building on 'cyberlaw' and 'cyberethics' and is ready to offer its services to the international community with the purpose of gradually establishing a body of principles applicable to cyberspace.

27. In the light of the above, the Executive Board may wish to adopt the following decision:

The Executive Board,

Having examined document 150 EX/15,

1. Noting the wide consensus achieved in consultations undertaken by UNESCO in the areas of information highways and new applications of information and communication technologies,
2. Bearing in mind, the importance accorded by the General Conference to promoting a deontological approach to information technologies in keeping with UNESCO's ethical mission and aimed at achieving harmonious development of these technologies while ensuring respect for linguistic and cultural pluralism and for the right of privacy,
3. Convinced of the need to implement, efficiently and in a timely manner, the strategies and activities foreseen in the 28 C/4 and 28 C/5 documents in the areas of information highways and new applications of information and communication technologies;
4. Expresses its approval of the progress achieved in establishing a framework for action in these areas and in implementing intersectoral and inter-agency programme activities in this field;
5. Invites the Director-General to continue UNESCO's work within this framework in order to achieve maximum impact of the programme in the last two biennia of UNESCO's Medium-Term Strategy;
6. Favourably views the proposal to organize the UNESCO conference on Information and Communication for Development, provided that sufficient resources can be mobilized from within the Organization and from external partners;
7. Stresses the importance of UNESCO's contribution to the formulation of a body of principles applicable to cyberspace.

ANNEX

UNESCO AND AN INFORMATION SOCIETY FOR ALL¹

The Nations Educational, Scientific and Cultural Organization (UNESCO) is mandated by its 184 Member States inter alia to promote the free flow of ideas by word and image and to foster international co-operation in the fields of communication, information and informatics in order to narrow the existing gap between the developed and the developing countries in these areas. UNESCO's Medium-Term Strategy for 1996-2001 foresees a special focus on the application of communication and information technologies for development, democracy and peace. The present document gives an overview of the opportunities and challenges related to these technologies and outlines a framework for UNESCO action.

I. OPPORTUNITIES AND CHALLENGES

The dramatic acceleration in the development and use of information and communication technologies during the last few years has set in motion a worldwide process of transition from the 'Industrial' to the 'Information Society'. The depth and non-linearity of this process seem to have much greater social, economic and cultural implications for humanity than the Industrial Revolution of the past. Business, education, training, research, entertainment - indeed, all aspects of life - are increasingly affected by electronic networks and multimedia technologies, which are opening up new opportunities and challenges for all. As we move towards the third millennium, it is of the utmost importance to understand and to influence the fundamental changes brought about by the 'communication and information revolution'. The complexity and interrelation of today's world problems defy traditional explanations and solutions and require a completely new approach which must be both comprehensive and interdisciplinary. Moreover, individuals, groups and communities will need to develop not only new tools of analysis but also very different mentalities and attitudes in order to adapt to the emerging 'new' civilization based on information and knowledge.

At the heart of this transformation are technological advances which include the digitalization of various types of information - text, numbers, sound and images - and their integration into a single commodity, so-called 'multimedia'; artificial intelligence and the incorporation of user-tailored, interactive interfaces into information products and services; digital compression and switching techniques which facilitate the communication of ever greater volumes of information; an exponential increase in computing power coupled with dramatic reductions in costs; communication satellites with vastly increased power and accessibility, inexpensive optic fibre cable and new wireless technologies; and, perhaps most impressively, the explosive growth of computer networks and, in particular, of the largest among them, the Internet, which links millions of individual computers and users all over the world.

1. This document was prepared for the joint meeting of the Programme Commissions on 'Educational, scientific and cultural challenges of the new communication and information technologies' during the twenty-eighth session of the General Conference of UNESCO in November 1995. It has subsequently been updated to take into account the results of that debate as well as of the recommendations of the Advisory Group on Information and Communication Technologies convened by the Director-General of UNESCO in December 1995.

This combination and interaction of technologies is resulting in new products and services based on video, advanced image and voice processing, powerful techniques for automating information retrieval and routine transactions of all sorts, which are increasingly becoming accessible worldwide through interoperable networks. These 'new' technologies - or, to be more exact, the new uses of technologies - are stimulating the convergence of industries. In industrialized countries, the last few years have seen strategic moves towards partnerships and alliances among cable companies, telecommunication operators, broadcasting networks and computer, publishing and entertainment enterprises. Markets for new information and interactive services are being aggressively explored and developed, as information providers and carriers seek to expand their activities beyond their traditional borders.

Most important of all, there is now a political will in many countries to support and encourage these processes. New legal frameworks and standards are being set up to promote the development and interconnection of national information infrastructures. Well-conceived information highways would further stimulate the already burgeoning national and international markets for information services and products.

Today the industrialized countries have an overwhelming lead in all these advances, while for a great number of developing nations even 'old' technologies, like television, telephone or even electricity, are still only a dream. However, a closer look reveals that the new information and communication technologies offer immense opportunities to all societies and individuals for alternative, truly universal and often cheaper ways of accessing and disseminating information.

Examples already abound of developing countries' using information technology in education or health to help break the vicious circle of poverty and isolation, or leapfrogging heavy industrialization by the creation of new sectors of sustainable economic development like software production or data processing. The importance of the information revolution has been recognized at the highest political levels in many developing countries. One recent example is the resolution of the Conference of African Ministers Responsible for Economic and Social Development and Planning (Addis Ababa, May 1995) to set up a High-Level Working Group of African Experts to develop a regional plan of action on information technologies - called Africa's Information Society Initiative - and to mobilize the necessary financial resources for its implementation.

The concerns of developing countries regarding their participation in the Information Society thus bear less on whether it should be accorded high priority, than on how to effectively apply information technologies to development so as to reduce, rather than widen and deepen the gap between 'haves' and 'have-nots' and worsen inequality across the technological divide. The major problems are posed not by the technologies as such, which can in general be acquired and adapted if appropriate resources are mobilized, but rather by political, social, organizational and ethical issues involved.

Whether humanity as a whole is to benefit from these opportunities will depend not only on the transfer of technology, but first and foremost on enhancing human capability to make the best possible use of information technology. Only on that condition can the Information Society hope to attain its ultimate goal - empowerment of all its citizens through access to and use of knowledge.

New opportunities for development

The economic and commercial opportunities of information highways are certainly significant, but the impact of information technologies on sectors of public concern is perhaps of even greater significance. Of particular interest and relevance to UNESCO is the impact of information highways and multimedia technologies on 'intellectual' areas which are at the core of the development process.

In the field of education, information technologies are viewed as a means of complementing traditional educational techniques to enable education systems to adapt to the different learning and training needs of societies. Computer simulation, telematics, and teleconferencing, alongside educational television or radio, have great potential to reach larger audiences than the traditional classroom process, and to make learning more effective, attractive and stimulating. The increasing variety of interactive media (e.g. compact discs and interactive television) enlarges the scope and possibilities of self-directed learning. These tools provide an unparalleled opportunity for 'reaching the unreached', particularly the 900 million illiterates in the world and the 130 million children unable to attend primary school, and for making lifelong education for all feasible, particularly for learners for whom access is limited by time and space, age, socio-cultural environment, work schedules and physical or mental handicaps. Modern distance education systems, of which UNESCO's 'Learning without Frontiers' initiative is a forerunner, can not only give learners access to knowledge available in different parts of the world, but also ensure dialogue - the main factor in effective learning - both among learners and between learners and sources of learning.

Scientific research, where computer networks and many telematics applications originally developed, remains one of their most active consumers. For scientists, the major advantage of information highways is the possibility to access, disseminate scientific information and share research facilities more quickly, on a larger scale and in a more interactive way. Research groups in the natural and social sciences will increasingly become 'virtual' - composed of interconnected specialists working on the same problem in different parts of the world. Electronic publishing will provide faster and cheaper access to scientific literature, and facilitate the maintenance of an international archive of scientific accomplishments. These trends will be particularly beneficial to scientists in developing nations who would otherwise not have easy access to laboratories, documentation and data bases; they will provide new opportunities to collaborate with colleagues elsewhere in the world, and mitigate, if not solve, the problem of South-to-North brain drain.

In the field of environment, information technology will help to expand humanity's capacities to understand and manage physical and ecological processes, and to forecast and respond to disasters and catastrophes. The Global Observing Systems for environmental monitoring, being set up through a United Nations system-wide initiative in which UNESCO has a major role, are possible only because of advances in data sensing, processing, communication and presentation. Information technologies will also enable the establishment of better disaster warning systems and systems to help plan and co-ordinate response and relief efforts; the function of these systems to limit mortality, injury and loss of property will be facilitated by seamless links with the communication media available in the home and workplace.

In the field of culture, multimedia technologies already offer tremendous possibilities for the promotion and sharing of physical and non-physical cultural heritage. The availability of multimedia cultural products and services on information highways will provide limitless possibilities for everyone to enjoy the world's culture in all its diversity. At any time, one will be able to listen to a concert or visit a museum in a virtual mode without the necessity of

travelling or queuing. Moreover, three-dimensional imaging and interactive interfaces open up vast new horizons for experimental art. On the whole, these technologies have an immense potential for enhancing cultural identities, promoting intercultural dialogue and stimulating artistic creativity.

The mass media have already adopted major technological innovations such as electronic editing and generation of images in television programme production, as well as computerized and communication-assisted publishing of the printed press. Interactive television and multimedia open up yet unexplored perspectives not only for entertainment, but also for educational and cultural programmes and for the popularization of science, and are likely to enhance the role of public service broadcasting. News agencies are obvious beneficiaries of computer-based technologies which allow more efficient news production and distribution. If the rapidly developing media technologies are made available over a truly universal broadband network, the media's capacity to provide information and entertainment will increase almost beyond imagination.

Libraries - whether school, university, public or specialized - are certainly destined to play an ever greater role in the dissemination of knowledge and experience. Computerized and interconnected, they will be able to pool their resources and provide to their clients access to immense stores of information. Moreover, they are ideally placed to serve as public gateways to information highways, providing as they do both access and guidance and training to users. *Archives* will adapt their storage and preservation function to the impermanence of digital information which in many cases will replace paper documents. They will also become increasingly involved in electronic information provision as their clientele in government, research and the general public develops ever more sophisticated needs.

Professional and institutional distinctions in the dissemination of information and education will blur as new services develop and gain ground, driven by a market of aware and active citizens. While the focus for these services in industrialized countries will be the home and the workplace, in many developing countries, especially in rural areas, community-level access will be particularly important. Community tele-centres offering library, information and media access, social services like education and telemedicine and fora for participatory democracy, as well as personal communication facilities, will become possible, based on the co-operative organization of services and on enabling 'last-mile' communication technologies.

New challenges to society

At the centre of the challenge posed by the emerging Information Society is the concept of universal service and how a 'right to communicate' will evolve in a digital world where the basic services required by all citizens are becoming more extensive and complex. Access in this context involves not only physical availability and cost, but also ensuring that the user can benefit from the services concerned, through a minimum level of 'digital literacy' and through appropriately adapted interfaces. In the increasingly competitive and commercial world of information and communication, the risks of exclusion of disadvantaged populations are substantial - both within and among societies. These risks are of particular concern to the developing countries which need clear and resourceful policies if they are to benefit from the emerging communication revolution.

An important facet of the 'right to communicate' concerns access to telematics facilities

at affordable cost by the 'intellectual' sectors - education, science, culture, media, libraries and archives - which have a crucial role to play in the development of national information infrastructures. A study jointly carried out by the International Telecommunication Union (ITU) and UNESCO,² offered a promising three-fold strategy to be pursued collaboratively in this context: (i) co-operation among the users in order to consolidate their demand for telematics services, (ii) partnership between telecommunication operators and users to develop and expand services based on market principles, and (iii) enlightened public policies to promote the building and use of telematics infrastructure in development-related sectors.

Another important issue is the maintenance of linguistic and cultural diversity in the Information Society. Technology-induced globalization is seen by many as a threat to local customs, values and beliefs, as exemplified by that fact that, today, 90 per cent of the data bases on the Internet are in English. Technology also offers possibilities for the development of specialized services to cater for diverse cultural needs and there is every reason to suppose that these will flourish where legitimate cultural, educational or scientific demands exist. These advantages are, however, counterbalanced by a danger that these groups of media users may prefer cultural specificity to diversity and dialogue, and thus run the risk of shutting themselves into a cultural ghetto. At the same time, it must be kept in mind that many small- or even medium-sized countries do not have the critical mass, in either economic or demographic terms, to guarantee adequate national content and may thus largely depend on imported programmes and services. The rapid development of broadcasting technology and its convergence with computing and telecommunication give this issue a new complexity.

Increased access to interconnected networks and data bases raises major ethical and legal issues. These include: privacy of information and the right of individuals to check data pertaining to themselves, which is widely recognized as a fundamental human right; regulation of content of information circulating through information highways (e.g. information of an intolerant, racist, violent or pornographic nature, and particularly its access by children); computer piracy and other informatics crimes; and copyright where efforts are required to extend legitimate intellectual property protection to the rapidly changing multimedia digital environment while maintaining access to information needed to promote societal and economic development. In all of these cases, the risks and advantages of coercive measures should be carefully weighed, and other solutions, for example involving consumer action or voluntary codes of conduct of information professionals, may well prove to be more attractive. This issue is not fundamentally altered by the fact that information technologies themselves are providing partial solutions to these problems.

The effects of computer technology on individuals and their social behaviour are also controversial. Already today, one can do almost anything on a computer: study, work, shop, watch a film or chat with a friend, visit a library or a museum, read a newspaper or play games. This provides immense opportunities for access, but it can also unduly privilege the 'man-machine' relationship to the detriment of reflection, self-reliance and personal capacity-building. At a wider level, the emerging information highways constitute an important factor in major social transformations, such as the internationalization of trade and the development

¹ *'The Right to Communicate - At What Price? Economic Constraints to the Effective Use of Telecommunications in Education, Science, Culture and in the Circulation of Information'*. ITU and UNESCO, Paris, May 1995 (UNESCO/CII-95/WS/2).

of a world economic market, the globalization of news and personal communication, and changes in the labour force due to the increased use of telematics. The risks associated with many of these phenomena are poorly understood, and deeper scientific analysis will be needed before they can be adequately considered by policy-makers.

II. THE ROLE OF UNESCO

Under its Constitution, UNESCO is required to contribute to '*advancing the mutual knowledge and understanding of peoples, through all means of mass communication*', '*to promote the free flow of ideas by word and image*', to '*maintain, increase and diffuse knowledge*', and to '*give fresh impulse to popular education and to the spread of culture*'.

With the advent of the information age, these tasks have not only retained their relevance but, indeed, have taken on a new urgency, and concrete ways to fulfil them will need to be adapted to the new technological environment. In an era where the distinction between different forms of information is blurring, the principle of the 'free flow of information' - which until recently had been considered only in terms of mass media - must inevitably be applied to all types of information needed for the advancement of education, science, culture, peace and democracy.

Once accessible to all - irrespective of race, nationality, gender, location, occupation or social status - information and communication technologies can be instrumental for achieving a truly human-centred development.

It is true that economic and commercial interests now seem to be the main driving force for the building of information highways. But it is also obvious that culture, education and science, as distinct and integral parts of our civilization, cannot be left totally at the mercy of market forces. Information highways must not simply provide new and more powerful channels for electronic consumption. They must have large spaces for knowledge and value sharing, artistic creation and public debate. Just as the existing media do, new electronic networks must transmit the widest possible variety of opinions together with information which may not be commercially profitable or may interest only minority groups. In this regard, it is of the utmost importance to reaffirm the mission of public service media to meet the very basic educational, scientific and cultural needs of people in the new technological environment.

The above conceptual framework is reflected in UNESCO's current Medium-Term Strategy (1996-2001) and biennial programme (1996-1997) which foresee that the Organization, in collaboration with the United Nations system and the international community at large, will:

as part of its international intellectual co-operation function,

- encourage and facilitate the analysis of the societal impacts of communication and information technologies;
- contribute to the conception and promotion of international policies for the development of information highways, destined to embrace the developing countries in the Information Society and to avoid new types of exclusion within nations due to economic or other barriers;
- facilitate international debate on the human rights issues of the coming

information age, including the rights to information access and to information privacy;

- promote international reflection on major ethical and cultural issues concerning information highways, including those related to content, in particular its cognitive dimension and the social acceptability of information of intolerant, racist, violent or pornographic nature;
- participate in the process of reviewing copyright and intellectual property conventions to ensure that they remain relevant and effective in the emerging information society;
- catalyse reflection on the issue of artistic integrity and moral rights which are endangered by new technological possibilities for distortion and for distribution of distorted works;
- encourage the development and dissemination of methods for handling and accessing information in the fields of education, science, culture and communication;
- reaffirm the mission of the public service media to meet the very basic educational, scientific and cultural needs of people in the new technological environment;

and, ***as part of its technical assistance function,***

- assist Member States in elaborating national policies and regional strategies for optimum use of and access to information through modern technology, and in creating conditions conducive to the development of electronic cultural industries;
- promote, for example through pilot projects and training, the use of information networks and innovative multimedia technologies to foster development in the Organization's fields of competence, in particular as regards:
 - free flow of information in the fields of education, science, culture and communication, and the new role of libraries, especially public libraries, as gateways to electronic information;
 - distance education and innovative approaches to non-formal and lifelong education and learning;
 - virtual scientific laboratories, in which researchers from developing and developed countries can collaborate through telecommunications and telematics on common projects;
 - production and dissemination of diverse cultural products as a contribution to intercultural understanding and dialogue.

This strategy is designed to enable UNESCO to play its moral and intellectual role *vis-à-vis* the emerging Information Society, taking account of the educational, scientific and cultural needs of all nations and individuals and promoting a genuine symbiosis of cultures

based on mutual respect and enrichment.