UNISIST: INTERGOVERNMENTAL PROGRAMME FOR CO-OPERATION IN THE FIELD OF SCIENfIFIC AND TECHNOLOGICAL INFORMATION

Veena Saraf

In the present day world, the role of scientific and technical information has become increasingly important for an overall development of nations. The nations progress is totally dependent upon the quality of information, its easy availability, transfer and utilisation. The dynamic and affluent society is heading towards more and more complexities because of social, economic, technological and cultural advancements. These complexities can be solved only by providing complete and accurate information, which can in turn help the society getting aware about recent advancemen ts.

The information and data are of vital importance to the world. The scientific discoveries and inventions can be valuable to mankind only when consumers are able to utilize the available information effectively and meaningfully. It is necessary that information should be made available for effective utilization at national, regional and international levels in order to benefit society as a whole by way of reducing economic imbalances between developed and developing countries. Information requirements' given by OEeD alongwith their functions are given in Table 1.

TABLE-I

Information Requirements and Functions as Defined by OECD

Functions	*Information Requirements*
Research	~ew scientific & technological knowledge, Innovations & facilities.
Development & Design	Techniques, application of knowledge.
Production	Techniques, equipment, production control.
Materials	Specifications, quality control, and supply.
Marketing	Know-how & management, market characteristic & control.
Management	Know-how & techniques, management information system.
Finance	Control of access.

In view of the above, it was felt that there should be "universal control of scientific knowledge which should be accessible to society regardless of geographical location, language, economic status, etc."2 This required a global co-operative effort to co-ordinate information at all levels. In order to achieve this objective, efforts have been made by various organisations, societies and and individuals which did a spade work for the ICSUjUNESCO Joint Project which led to the formation of UNISIST.

UNISIST is not an acronym in the real sense but stands for various concepts like United Nations unification of methods and services, International Information Systems on Science and Technology. The subtitle of UNISIST as mentioned in the feasibility study report is "World Science Information System". Ever since the scope of UNISIST has been extended to social sciences and economics, it was felt that the subtitle should have more precise definition. The subtitle preferably to be used with UNISIST is "Intergovernmental Programme for Co-operation in the Field of Scientific and Technological Information."3

UNISIST is not an operational information system or service concerned with any discipline, subject or mission but a conceptual,

catalytic, promotional, dynamic and unique information programme which is considered as a "flexible network based on the voluntary co-operation of existing and future informatio~ se~-vices."4 The Secretary-General of the United Nations In hIS report to the 61st session of ECOSOC stated that "there is within the United Nations Systems, one information programme of a general nature designed to provide a conceptual framework for the establishment of national and international scientific and technological information systems and services and to facilitate access to the world information resources and to create the necessary condition for systems interconnection and compatibility. This is UNESCO'S UNISIST."

Basic philosophy behind UNISIST is the same as that of UNESCO. Article 1 of the constitution says "Organisation shall maintain, increase and diffuse knowlege .... , by encouraging co-operation among the nations in all branches of intell~ctual activity .... exchange of publications .... and other materIals of information and by initiating methods for international cooperation calculated to give the people of all countries access to the printed and published material produced by any of them".

Background

The origin of UNISIST can J;>e traced back to the middle of the 19th century. Various efforts were made by different organizations both national and international and individuals to investigate information needs at international level. Most important among them which need mention here are:

(*a*) Convention of Librarians in New York in 1853 where a proposal was made to .... "the establishment of a regular and permanent system of exchange between government, ... everything emanating from the genius of a nation. ..... Let us have a central agency ..... let us have a monthly publication in English, French and German which shall publish the proceedings of the agency and the titles of the books or objects exchanged."6

(b) Various efforts made by the Royal Society of London .. The Catalogue of Scientific Periodicals (1851-1925), Manuscripts Catalogue of the Scientific Periodicals in all Languages (1800-1860) and in 1896 suggested an international conference to consider the project-International Catalogue of Scientific Literature (1894-1935).

(c) Two scientists, P. Buquet and W. Chamberlin in International Conference on Scientific Information (ICSI) in Washington (1958) proposed that institutions such as UNESCO and ICSU should conduct an inquiry on the advisability of creating an international centre of scientific information to ensure close co-operation between all documentation centres.6

The proposals made by these scien~ists are important contributions which led to the formation of the present UNISIST.

UNESCO/ICSU Project

Much concern was expressed by scientists, librarians, documentalists, information scientists during 1960s about the un-co-ordinated handling of scientific and technological information at international level. In 1958, General Conference of UNESCO adopted a convention concerning the international exchange of publications. Its main objective was to reduce administrative and other barriers to the exchange of publications between government and non-government institutions of scientific and technical information. In 1963, it further called upon the co-operation of many parties, viz. scientific unions, professional associations of documentalists, translators and librarians, governmental and non-governmental documentation services, editors of primary and secondary journals and the organisation of United Nations. Three working parties were set-up in the following fields: (a) scientific publications; (b) automatic documentation; and (c) scientific translation and technology. All the three groups emphasised the need for co-operation of all sorts.

The 13th Pugwash Conference on Science and World Affairs which was held in Karlovy Vary, Czechoslovakia in 1964

stated that the existing abstracting services and systems for machine coding and indexing were being developed independently, so that information stored in one of them was not freely exchangeable with that stored in the other.. International Council of Scientific Unions (ICSU) at its 11th Conference held in Bombay in 1966 adopted a proposal to create a Committee for examining the feasibility of World Science Information System.

In the following year at the 14th General Conference of UNESCO, a project was included for the convention of an international conference on the transfer of scientific and technical information with the collaboration of ICSU, IFIP and FID. The main objective of the conference was, "the establishment of a mechanism which would provide for an operational framework and for the improvement of international exchange of scientific and technical documentation.» Since both the above projects of ICSU and UNESCO were *similar* in objective, these sponsoring bodies agreed to have a single programme to study the feasibility of World Science Information System. This was approved at the same session of General Conference of UNESCO along with the preparation of the International Conference on Information Transfer. This resulted in the formation of Joint ICSU jUNESCO Central Committee in 1967 under the chairmanship of Dr., Harris Brown, Foreign Secretary, at the National Academy of Sciences, Washington and Vice-Chairman of ICSU, to study the feasibility of World Science Information System.

This Central Committee approved six working groups, an advisory panel and executive committee to study the various problem areas. Each working group met under the chairmanship of a member of a Central Committee. Advisory panel composed of representatives of large operating systems was constituted to advise on technical matters referred to it by the Central Committee. Various study reports of these working groups were reviewed at four meetings of the Central Committee and the final draft was submitted in October 1970 and published by UNESCO in the following year as UNISIST-Study Report on the Feasibility of a World Science Information System.

Phase I

Group No. 1- Tools of System Intercommunications

(a) Standards of bibliographic description (Rec 2 & 3)
(b) World Register of Scientific Periodicals (Rec 3)
(c) Development of Indexing tools and language control (Rec 4)
(d) World survey of information sources (Rec I)

Group No. V-Assistance to Developing Countries

(e) Linking developing countries with UNISIST (Rec 21)

Phase II

Group No. II-Effectiveness of Information Services

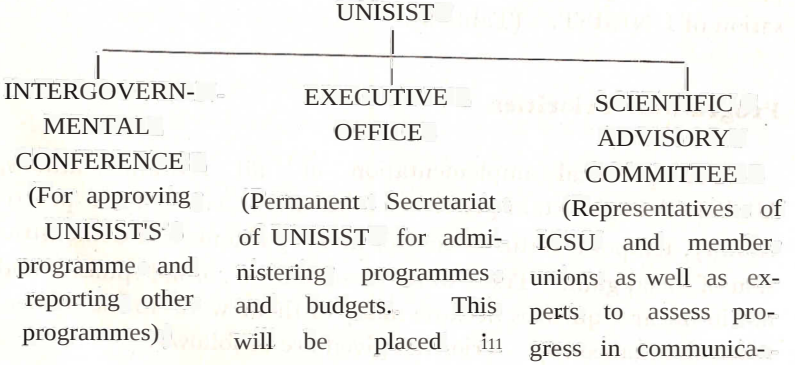
(f). Development of information analysis centres and data evaluation centres (Rec 9 & 10)

Group No. Ill-Responsibility of Professional Groups

(g) To encourage research in information science at international level (Rec 14)

Organisation

(a) UNISIST I: Recommendation 22[7] of UNISIST feasibility study report provides following organisational pattern of UNISIST:



Science Sector of UNESCO) tion practices, changes in user's requirements as a basis, for and as a result of UNISIST Programme)

TABLE-2

UNISIST Feasibility Study Report Recoullnendations

Group No.	Programme Objective	Recommendation Number	
	(i) Improvement of tools of system inter-communication.	6	*(i)* To survey information services as a basis for World referral network, *(ii)* establishment of international standards for bibliographical description, *(iii)* World register of scientific periodicals, *(iv)* better tools for control of natural and indexing languages in S&T, *(v)* standards for machine interface, *(vi)** review perspectives of potential of telecommunication and teleprocessing networks for the transfer of scientific information.
	(ii) To strengthen the functions and effectiveness of information services.	4	*(i)* * Library infrastructure as essential component of scientific information transfer, *(ii)** strengthening of basic access services viz. abstracting, indexing and translation services, *(iii)* development of information analysis centres as necessary complement of above basic access services, and *(iv)* deve~opment of numerical data centres specially CODATA in accordance with UNISIST.
	(iii) To develop a1?-strengthen professional groups, constituting manpower for future information networks.	4	*(i)* * Authors and editors should exercise responsibility of maintenance of quality control, *(ii)* * international agencies should influence scientists to participate in programmes aimed at improvement of World-wide information transfer, *(iii)* IFLA, FID & IFIP and other Unions should help in manpower _development, *(iu)* research in information science should be encouraged and a group on evaluation of research should be established within the framework of UN IS 1ST.
	(iv) To provide optimal institutional environment for development of systems interconnectibility and co-operatIOn.	5	(i)"* National scientific information agencies should co-operate in programmes of international scope within UNISIST goals such as *(ii)** world-wide availability of scientific documents and data *(iii)** information transfer network, *(iv)** pricing policies and *(v)** administrative barriers.
	(v) To assist developing COUIl-tries by helping them to develop minimum bases.	2	*(i)* * A well funded national structure for scientific research and development as a pre-requisite for effective library and documentation network, *(ii)* linking the development of countries with UNISIST with regard to technical information needs.
	(vi) Organisation of UNISIST	1	Discussed under heading "Organisati<m of UNISIST"

UNISIST Intergovernmental Conference in 1971 recommended that, "a Steering Committee of)8-23 members be elected at the General Conference of UNESCO from among its member states. This Committee will supervise and when necessary, revise the priorities of the programme within the framework of the long term plan of action approved by General Conference of UNESCO and will report to the intergovernmental conference". [9] The 17th session of the General Conference of UNESCO passed the above recommendation of Intergov,ermenal Conference (Resolution, 2.31) resulting into addition of a Steering Committee to the above organisational pattern of UN IS 1ST.

(b) General Inforlllation Prograllllle (PGI) /UNISIST II

The recommendation of the Intergovernmental Conference on the Planning of National Documentation, Library and Archives Infrastrcture (NATIS) which was organised by the Department of Documentation, Libraries and Archives in 1974 was similar to those of UNISIST Intergovernmental Conference (1971). There was some duplication in these progammes. The 9th session of the General Conference in 1976 approved the merger of the a;bove two programmes to avoid duplication.. The new programme thus formed in February 1977 is known as "General Information Programme (PGI/UNISIST II." The retention of the name UNISIST was recommended) by the General Conference for appropriate use. The organisation of PGI/UNISIST II is as follows:

General Inforlllation Programme (PGI) /UNISIST 11*

INTERGOVERNMENTAL COUNCIL (30 members to guide, plan and for implementation of PGI in the interest of development of education, culture, science and technology)	EXECUTIVE OFFICE (This reports to Assistant Director-General for studies and programming)	ADVISORY COMMITTEE

*(UNESCO General Conference: 19th session 1976. Nairobi Report of the Director-General on the Over-all Information Programme, Paris, UNESCO 1976, 34 p. (doc. 19 c(42).

Implementation

UNISIST is not to act as highly centralised agency. Actual implementation, will rest upon the governments, UN agencies, international organisations responsible for information handling and transfer.. Function of UNISIST is just to co-ordinate various activities of the above agencies.

First UNISIST Intergovernmental Conference was held during 4-8 October, 1971. It was attended by 326 participants representing 85 member states and 40 intergovernmental and non-governmental organisations. It was emphasised that, "Special attention be paid to the complex and urgent needs of the developing countries and in particular their need for scientific and technical, as well as economic and social information, for training and for provisions of adequate infrastructure and for stimulating or initiating new systems when needed[9].

A meeting of non-governmental organisations with a special interest in UNISIST and its implementation was held in Paris in March 1972. This informal meeting was convened by ICSU and was attended by representatives from CODATA, FID, ICSU/AB, IATUL, IFIP, IFLA, ISO, UNESCO and WFEO. While taking into account the objectives of UNISIST, the participating organisations discussed the possibilities of ~ontributing to the implementation of UNISIST programme. The areas reviewed were system interconnection, improvement of information transfer, manpower, scientific information policy and networks, copyright, customs and pricing needs of developing countries and organisation of UNISISTlo.

In November 1972 General Conference of UNESCO at its 17th session authorised the establishment of UNISIST programme with the following goals:

(a) To advance and co-ordinate the world trends towards information sharing and co-operative agreements among governments, international organisations and operating information services.

(b) To provide guidance and catalytic action for the necessary developments in the field of scientific and technical information.

(c) To facilitate the access of published information to scientists, engineers and technologists.

(d) To help the developing countries meet their needs for scientific and technical information.

Progress and Development

Mr. de Costa, while addressing delegates at the Intergovernmental Conference on Scientific and Technological Information for Development (UNISIST II) said that three major developments have taken place since UNISIST I. These are" the affirmation of the new economic order based on justice and correction of imbalances; the new orientation of the United Nations system towards deve!opment objectives; and new broader conception of development itself that had changed." The progress and implementation of UNISIST during last one decade is summarised as under:

(a) *Tools .for system intercommunication:* Various guidelines and manuals were published. Important among them are: *Reference Manual for Machine Readable Bibliographic Description* by UNESCO/ICSU-AB. This serves not only as exchange format for abstract information but also as a cataloguing tool.

The working group on system intercommunications issued *Publishers Series; Bibliography on the Presentation a~d Preparation of Documents Containing Scientific and Technological Information; UNISIST Guide to Standards for Information Handling; Standards Handbook* I : *Information Transfer* ISO; *International Standards Bibliographical Description for Monographs and General ISBD(M) and ISBD(G); Guidelines for the Establishment and Development of Monolingual Thesauri and Guidelines for Presentation in the Primary Literature of Numerical Data Derived from Experiments (CODATA).*

International Information Systems and Centres which are

closely associated with UNISIST are ISDS, IFOTERM, UNIBID: UK and ISODOC regarding standardisation of various bibliographic terms. The draft scheme of BSO was submitted to UNISIST by **FID** during 1973-75. It is a broad Classification Scheme with the objective of achieving compatibility between various information systems.

There is close co-operation between ISO and UNISIST in matters relating to technical standards and contin¥ous support is provided to the International Inform<l,tion Centre on Standards in information, documentation, and related fields (ISODOC) within the framework of ISO.

(d) *Effectiveness of Information Services-Main* orientation has been towards improving access to information in developing countries. Various national proj ects for establishment of national scientific and technological information agencies were financed in some developing countries so that they can derive maximum benefit from UNISIST.

Numerical and quantitative data are as essential information as any other type of information. It is "regarded as a crystallized presentation of the essence of scientific knowledge in the most accurate form and playas such an increasing role in science and technology."11 UNISIST in collaboration with CODATA developed a network among numerical data centres and their related function to bibliographic activity. An exchange format for numerical data was drafted and various short term courses were held in handling of numerical data. UNISIST commissioned CODATA to study the role of Information Analysis Centres (lAC) in a World Science Information Network. A working group on lAC was formed to review this, which met for the first time in November, 1975. This was done to implement recommendation of the UNISIST feasibility study.

(c) *Training & Education of Professionals and Users-Education* and training of information specialists and users especially in developing countries was assigned high priority.

Various seminars, conferences and training courses both short-term as well as long-term have been organised for the development of national and regional education and training programmes.

The first meeting of the Steering Committee recommended the establishment of *Ad hoc* Committee on Education and training policy and programme. This committee met in 1975, 1976 and 1978 and advises UNISIST and evaluates specific projects. *Newsletter:on Education and Training Programme for Specialised Information Personnel* is being issued with the help of FID.

Two guidelines on curriculum development in information studies and on formulating policy on education, training and development of library and information personnel were prepared. Various guidelines published for information specialists under the programme of UNISIST are *Handbook for Information Systems and Services; Guidelines for the Organisation of Training Courses; Workshops and Seminars in Scientific & Technical Information & Documentation; Education & Training of Users of Scientific & Technical Information; UNISIST Guide for Teachers; Guidelines for the Evaluation of Training Courses, Workshops & Seminars in Scientific & Technical Information & Documentation.* During 1979-80 additional training courses for teachers were organised and assistance was given to member states for conducting intensive refresher seminars on modern teaching methods and materials.

(d) *Assistance to Developing Countries with Particular Reference to India-Assistance* is given in the form of short-term consultant missions to developing countries for the following purposes;

(i) To review the national requirements in scientific and technical information with special attention to the needs of users;

(ii) To review the training and education needs for specialised manpower;

(iii) To advise on national scientific information policy;

(iv) To advise on the improvement of existing scientific and technical documentation and information centres and services in science and technology;

(v) To assist in the establishment of national or regional scientific and technical information networks; and

(vi) To assist in the preparation of their request for assistance under the UNDP regarding scientific and technological information.[12]

Many pilot projects were undertaken to introduce new technology and techniques for creation of national and regional systems and networks in member states. These were then subjected to evaluation before being recommended for application. With the help of Canadian Institute for Scientific and Technical Information (CISTI), SDI services were started in many countries and services were provided not only to host but to neighbour countries as well. This system has been evaluated using UNISIST methodology and the results were discussed in Canada in 1978. India also experimented with the above CAN/SDI service at IIT, Madras which has proved a success.

With the help of European Space Agency Information Centre, Frascati, Italy, UNISIST supported a successful demonstration of on-line access to remote data bases in 1976 in Bombay. Twelve hundred scientists in India participated in searching the ESRIN / RECON data bases located in Frascati, Rome.

A project "on transfer of scientific and technical information predominantly to rural population in developing countries" was initiated in 1975. The main purpose was to measure its impact on development. Field surveys were conducted in various countries including India. The report of these surveys were discussed at the meeting in Bangalore in 1978 in collaboration with ICSU Committee on Science and Technology for Development(COSTED).

In 1979, a basic manual on information for udtrained staff in developing countries was published.

(e) *UNISIST News letter-First* Intergovernmental Conference approved the publication of *UNISIST Newsletter* which

was started from 1973. It is published quarterly and gives details of various activities of UNISIST programme.

Intergovernmental Conference on Scientific & Technological Information for Development (UNISIST II)

The Intergovernmental Conference on Scientific and Technological Information for Development (UNISIST II) was held in Paris from May 28 to June 1, 1979 in accordance with resolution 5/10.1/1 adopted by the General Conference at its 20th session. The main objectives of the Conference were: *(a)* to review scientific and technological information (STI) achievements since UNISIST Intergovernmental Conference; *(b)* to examine the flow and utilization of STI within the context of socio-economic development; and *(c)* to propose strategies for future action at the national, regional and international levels and contribute to the United Nations Conference on Science and Technology for Development (UNCSTD).

In his inaugural address, Director-General said, "This conceptual framework .. can be applied to the whole of knowledge, the total world information resources JJ13

UNISIST has become an integral part of General Information Programme (PGI) following decisions taken by the General Conference in Nairobi in 1976.

Main working document was prepared for delegates which reviewed achievements since 1971, flow and utilization of STI and its role in development and gave strategies for future action at the national, regional and international levels. After discussing the main working document, the conference gave three recommendations.

Recommendation-I-is addressed to the United Nations Conference for Science and Technology for Development (UNCSTD). Prior to elaborating guidelines for future action, full advantage be taken on the considerable experience accumulated by UNESCO through UNISIST and also by other specialised information systems and services operating within conceptual framework of UNISIST.18

Recommendation-II-is addressed to the member states of

UNESCO, "to set up national and regional data and information analysis centres for the purpose of collecting, evaluating, processing and making effective use of foreign and domestic data in the field of S&T, facilitate interaction among information specialists, the scientific and technological communities, all industrial and agricultural sectors, development specialist and planner, in order to apply information in meeting national needs, assign high priority to the training programme of information users."

Recommendation-Ill-addressed to UNESCO says "continued implementation of the UNISIST programme particulary with a view to strengthening UNISISTJs current role in catalysing and harmonizing the design and development of information systems and services of the UN systems. J)

It was further recommended that programme priorities on the recommendations of Intergovernmental Council of PGI should be submitted to 21st General Conference within draft programme and budget for 1981-83.

Conclusion

To sum up, UNISIST has achieved considerable success since its inception. It has extended its scope to whole range of world information as per needs of the world society. A great deal is yet to be achieved which is dependent upon the co-operation between developed and developing countries. Its success further depends upon the designing of national infrastructure by all the countries.

Appendix A

List of abbreviations used

BSO	Broad System of Ordering
CISTI	Canadian Institute for Scientific 'l.tnd Technical Information
CODATA	Committee on Data for Science and Technology
COSTED	Committee on Science and Technology for Development

ECOSOC	Economic and Social Council (UN)
FID	International Federation for Documentation
IATUL	International Association of Technical University Libraries
ICSU	International Council of Scientific Unions
ICSUjAB	International Council of Scientific Unions Abstracting Board
IFIP	International Federation for Information Processing
IFLA	International Federation of Library Associations
IFOTERM	International Information Centre for Terminology
ISBD	International Standard Bibliographic Description
ISDS	International Serials Data System
ISO	International Organisation for Standardisation
ISODOC	International Information Centre on Standards in Information and Documentation and Related Fields
OECD	Organisation for Economic Co-operation and Development
PGI	General Information Programme
SDI	Selective Dissemination of Information
UNCSTD	United Nations Conference on Science and Technology for Development
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNIBID	International Centre for Bibliographic Description (UK)
WFEO	World Federation of Engineering Organisations.

REFERENCES

1. Hawthurne, E. P. Transfer of technology, proceedings, of seminar, Paris, OECD, 1971.
2. UNESCO and ICSU. UNISIST study report on the feasibility of World Science Information System, Paris, UNESCO, 1971, p. 24.
3. *UNISIST Newslett",* 4(3) : 1976: p. 4.

4. Unesco and ICSU. UNISIST: study report on the feasibility of a World Science Information System, Paris, UNESCO, 1971, p. 19.
5. Henderson, M. M. Cooperative convertibility and compatibility among information systems: A literature review, US Government Printing Press, 1966, p. 8.
6. Boquet, P. Creation of an international centre of scientific information. *In:* International Conference on Scientific Information (IGSI), Proceedings, 1959, Washington, pp. 1517-1521.
7. UNESCO and ICSU. UNISIST: Study report on the feasibility of World Science Information System, Synoptic Version, Paris, UNESCO, 1971, p. 76.
8. Wysocki, A. and Tocatlian, J. A World Science Information System. *Uneses Bull Libs.,* 25: 1971: 62.
9. Quoted by Wysocki, A and Tocatlian, J. UNISIST Intergovernmental Conference. *UnescoBull. Libs.,* 26: 1972: 58.
10. Implementation of UNISIST. *FID News Bull.,* 22: 1972: 42.
11. Mangla, P. B. UNISIST: World Science Information System. *J. Lib. Inf. Sci.,* I : 1976. 54.
12. Tocatlian,]. UNISIST implementation plans, *ASIS.,* 9: 1972: 14.
13. UNESCO. Intergovernmental Conference on Scientific and Technological Information for Development. (UNISIST II). 28th May-I June, 1976. Final report, Annex p. 2.