

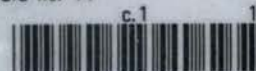
IDRC-LB-15108

Meeting on the
FEASIBILITY OF AN INTERNATIONAL INFORMATION SYSTEM
FOR THE DEVELOPMENT SCIENCES (DEVSIS)

DEVSIS
Working Papers

Co-sponsored by the
International Development Research Centre
the Organization for Economic Co-operation and Development
and Unesco (within the framework of its UNISIST programme)
OTTAWA, 11-13 JUNE, 1974

ARCHU Proceedings / Meeting on
DEVSIS no. 11



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**FEASIBILITY OF AN INTERNATIONAL INFORMATION SYSTEM
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GENERAL INFORMATION

Attached you will find the schedule of events and a sheet giving general locations. Please wear your name badge to all functions to facilitate communication. IDRC staff members can be identified by blue badges.

HOTEL ARRANGEMENTS

With regard to the DEVSIS participants for whom IDRC is paying the hotel bill, it is only necessary for you to sign the bill upon departure. Luncheons will be served at the Centre and there will be a Conference dinner on the 11th June evening. For the other meals the Centre allows a reasonable amount to be charged to the bill excluding, of course, liquor. We would appreciate it if you would settle any personal expenses incurred at the hotel before checking out.

COMMUNICATIONS

The Information Sciences Division (10th Floor)

Staff members in the Information Sciences Division (10th Floor) will assist you with any problems related to mail, telegraphic and telephone facilities.

TOURS

There will be two library tours on the morning of 13 June, 1974. Please indicate your preference on the Library Tour Request Form and return it to the Conference Staff.

TRAVEL

Mrs. Rose Wood and the staff of the Travel Section (9th floor) will be available from 9:30 - 4:30 on working days to assist you with travel arrangements. Please indicate your requirements on the attached travel sheet.

TELEPHONES

IDRC: 996-2321

Hotel Chateau Laurier: 232-6411
Skyline Hotel: 237-3600

Extensions within the Centre:

WOOLSTON, J.E.: 172

VESPRY, A: 211

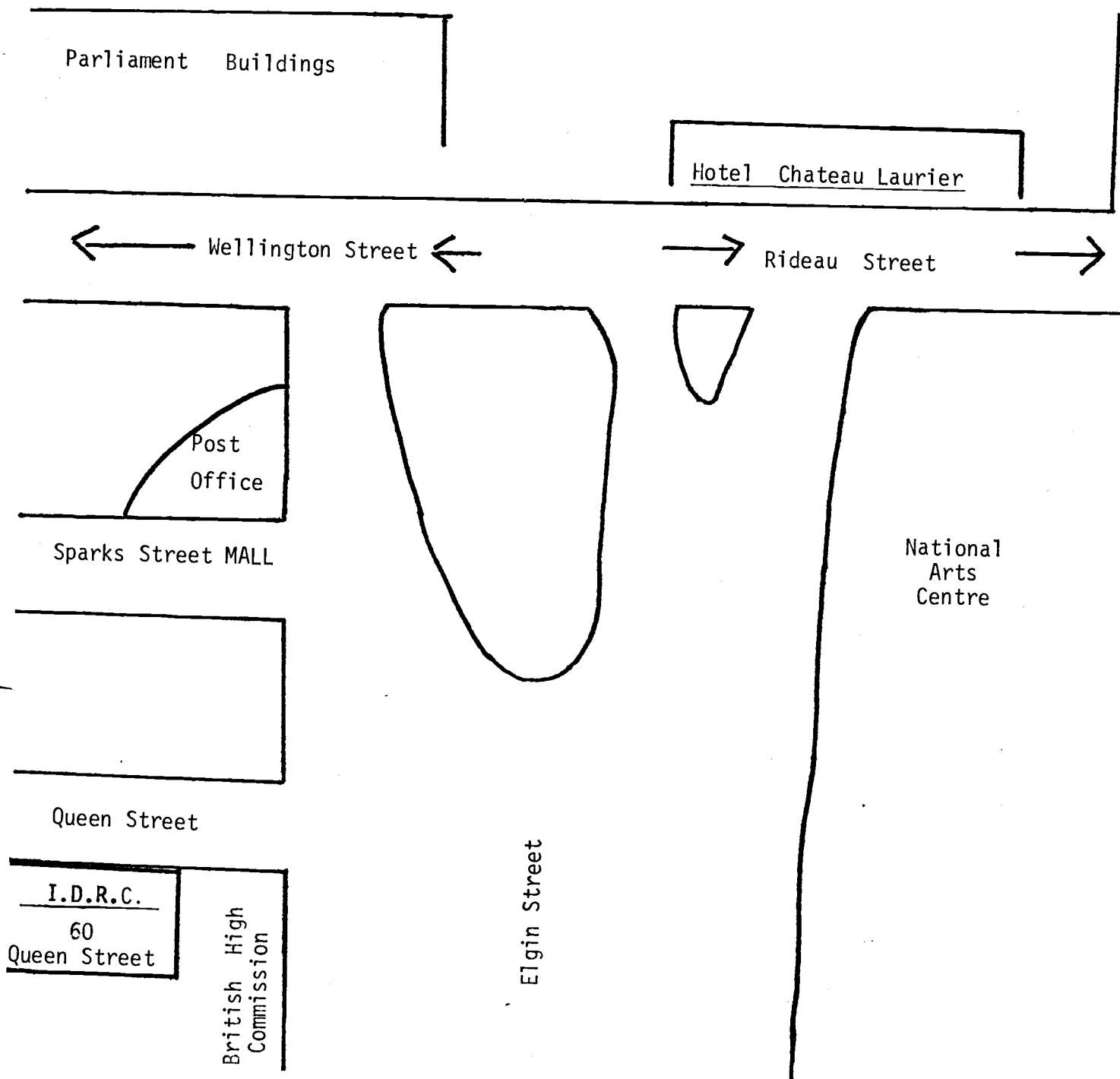
Conference Section: 136

Travel Section: 166

Dial "0" for information

GENERAL LOCATIONS

Hotel Chateau Laurier in relation to IDRC (60 Queen Street)



DEVISIS CONFERENCE - IDRC, 16th FLOOR:

Take the ground floor elevator to the 15th floor. After getting off, make the first left turn and take the special elevator to the 16th floor.

AT IDRC:

- 1) Information Sciences Division - Mr. John E. Woolston, Director, Centre - 10th floor; Hotel - Room 258
- 2) Library, Mr. Arthur Vespry - 11th floor
- 3) General Reception Area - Conference and Travel Assistance: Centre - 9th floor; Hotel - Room 249

LIBRARY TOURS - JUNE 13, 1974

On the morning of June 13, tours have been arranged to the National Library and the National Science Library.

National Library

The visit to the National Library will include a short film describing the National Library, followed by a description of the Research and Planning Division of the National Library. There will also be descriptions of the CAN/SDI service and the Micrographic Unit.

9:00	Auditorium - Film; on Research and Planning	Louis Forget or Hope E.A. Clement
9:45	Canadiana A to Z	Denise Fortin
10:30 - 10:55	Coffee - Cafeteria	
11:00 - 11:20	CAN/SDI	Monique Perrier
11:20 - 12:00	Micrographic Unit	T. Sled

National Science Library

The tour of the National Science Library will commence at 9:30 with a short talk by Dr. Jack Brown on the role of the National Science Library in Canada and a description of some of its major activities. There will also be a demonstration of the new CAN/OLE on-line retrieval system on selected science data bases.

9:30	Description of National Science Library	Dr. Jack Brown
10:00 - 10:20	Coffee	
10:20 - 11:00	Tour of the new National Science Library	Robert Shanks
11:00 - 12:00	Demonstration and discussion of CAN/OLE on-line retrieval system.	Georg Mauerhoff

LIBRARY TOUR REQUEST FORM

In order for us to make arrangements for the tours to The National Library or The National Science Library, we would appreciate it if you would kindly fill in this form and return it to the Conference Staff. There will be a staff member present at the Coffee break and luncheon on Tuesday, 11th June, in case you have not been able to return the sheet before then.

Please check one of the following:

_____ 1) I would like to visit the National Library.

or

_____ 2) I would like to visit the National
Science Library.

.....

Mr. Arthur Vespry, the Centre Librarian, will be in charge of these tours, both of which will depart from the main door of the Chateau Laurier at 9:00 a.m. on Thursday, 13 June 1974.

SCHEDULE

Monday
10 June 1974

6:30 - 8:30 Cocktails with Mr.J.E. Woolston, Director of Information Sciences, IDRC, and Mrs. Woolston, at the Chateau Laurier.

Tuesday
11 June 1974

9:30 a.m. Opening of Meeting by Dr.W.D. Hopper, President, IDRC, at the Centre, 60 Queen Street, 16th Floor, Board Room.

11:00 a.m. Coffee Break

11:30 a.m. Meeting resumes

1:00 p.m. Luncheon will be served at the Centre

2:15 p.m. Meeting resumes

3:30 p.m. Coffee break

4:00 p.m. Meeting resumes

5:30 p.m. Meeting adjourns for the day

7:30 p.m. Bus departs the Chateau Laurier for the Royal Ottawa Golf Club

8:00 p.m. Informal Dinner hosted by Dr.W.D. Hopper, President, IDRC at the Royal Ottawa Golf Club.

Wednesday
12 June 1974

9:30 a.m. Meeting reopens

11:00 a.m. Coffee break

11:30 a.m. Meeting resumes

1:00 p.m. Luncheon will be served at the Centre

2:15 p.m. Meeting resumes

3:30 p.m. Coffee Break

4:00 p.m. A possibility of free time for participants to visit IDRC Library and observe ISIS operations

Thursday
13 June 1974

9:00 a.m. Departure from the main door of Chateau Laurier for the National Library and the National Science Library

12:30 p.m. Tours return to IDRC

1:00 p.m. Luncheon will be served at the Centre

2:15 p.m. Meeting resumes

3:30 p.m. Coffee break

4:00 p.m. Meeting resumes

5:30 p.m. Meeting closes

INTERNATIONAL DEVELOPMENT RESEARCH CENTRE

DEVSI: A DEVELOPMENT SCIENCE INFORMATION SYSTEM

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January 1974

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*From 1967 to 1970, the author of this paper was Director of the Division of Scientific and Technical Information, International Atomic Energy Agency, Vienna, during the design and implementation of the International Nuclear Information System (INIS); he is currently also Chairman of FAO's AGRIS Implementation Advisory Group.

SUMMARY

This paper proposes the creation of a world-wide system to handle information about economic and social development activities, with the co-operative participation of both developing countries and development-aid agencies. The system would be based on the experience of international organizations in building similar systems to handle information about atomic energy (INIS) and agriculture (AGRIS), and it would be founded on principles elaborated by Unesco (UNISIST).

As with INIS and AGRIS, the work of collecting information for the system would be decentralized among the participating agencies. The inputs would be merged and the complete file made available both as a computer record and in printed form with indexes. Tentative costs are indicated as well as a schedule of actions to secure the necessary agreements and commitments. IDRC's readiness to support co-operative action is expressed.

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DEVISIS: A DEVELOPMENT SCIENCE INFORMATION SYSTEM

INFORMATION SYSTEMS

It has become common-place to talk about the problems that result from the phenomenal acceleration in the production of new information, and to refer to the several million new books, articles and documents that are published in the world each year. Many diagnoses of the problems have been offered, as well as many prescriptions for appropriate remedies. However, until the last few years, most of the attempts to organize the world's literature had been made by national institutions or by scientific societies; now there are several international initiatives that perhaps point the way, if not to final solutions of the problems, at least to mechanisms for coping with them.

What is an information system? Ideally, of course, it is a mechanism to which you can address a question and which will then give you an answer based on the latest and most accurate information known to man. Close approximations to such ideal systems do exist for some subject areas where both questions and answers can be expressed in precise formulations (e.g., what is the population of a particular county?). However, most information systems, as we use the term, respond to a question by giving us, not the information directly, but references to particular pieces of literature within which we may find the answers we seek. Subjects can be defined with considerable precision, so that - in response to a particular question - we may typically get five to fifty references out of a file of several hundred thousand references.

But the building of such a system requires a considerable amount of work. Nothing can come out that has not first been put in. If we have a file of several hundred thousand references, it will have cost

several million dollars to put it together (\$10/reference is not a high figure). Each relevant piece of literature has to be found; its value must be assessed and a yes/no decision taken on whether to include it; a description must be prepared to indicate who published it, where and when; its subject must be defined by means of words or codes that are acceptable to the system; for some systems, an abstract is written; and finally all this information must be recorded in the prescribed manner which, for a computer-based system, implies a keyboard operation with a high degree of accuracy.

With the growth of the world's literature, it has become very difficult for a single institution to find the resources needed to provide comprehensive coverage of a broad subject. This is why most of the large systems are trying to find ways to share the burden and cost of input preparation. The biggest economic argument for the international systems is that they provide for the decentralization of the task, with each participant preparing input describing only those publications that appear in the territory for which he accepts responsibility.

EXISTING INTERNATIONAL ACTIVITIES

Such, for example, is the formula for putting together the file of references which forms the principal asset of the International Nuclear Information System (INIS) of the International Atomic Energy Agency (IAEA)¹. The participating organizations are national governments - or institutions acting on behalf of national governments. Each participant reports relevant literature published in its national territory, and this leads automatically to a reasonably equitable distribution of the cost

burden. A nation with a large atomic-energy program is likely to produce many publications and to shoulder a heavy burden of input work; conversely a nation with a small program is likely to have few publications to report to the system. And, potentially, the nation with the large program will derive proportionately greater benefits from the existence of the system and the products that it provides.

The main product - though there are others, actual and potential - consists of the file of references with mechanisms for achieving selective access to it. The file is issued on magnetic tape for those who wish to search it or manipulate it in computer systems. It is also printed out in book form with indexes for those who do not need, or cannot afford, a rapid searching and sorting capability.

INIS has now been operating for more than three years. Many problems have been encountered in its development, but most of these have been overcome, and the remaining problems appear to be amenable to relatively small investments of system development. It is now adding about 60 000 new items a year to its central file and, from the technical and financial points of view, it can be said to be coming within reach of the hopes and plans of its designers. And, from a political point of view, it has great advantages over all previous systems designed to serve the broad community of nuclear scientists and engineers. Because of their commitments to participate, the various countries have established and accepted world standards for processing information, and they have been led to upgrade their own national capabilities for handling the nuclear literature. This has required

investments at the national level - but investments that governments could make in the knowledge that the products would be compatible with the products of all other participating countries and that duplication could be avoided. Also the system is under international control and each participant has a voice in its management.

Partly as a result of the progress that had been made with INIS, the Food and Agriculture Organization of the United Nations (FAO) began its own study of an information system that would similarly handle the world's literature dealing with the agricultural sciences and technology. This system has been given the name AGRIS² and is expected to begin operation in January 1975. Considerable work has been done on its design and a small experimental data base has been created. From this data base, a demonstration printed output was produced in August 1973.

It is expected that the formula for participation in AGRIS may be somewhat different from that employed by INIS, given the much larger volume of literature (250 000 items per year) and the much more complex nature of the world's institutions that deal with agriculture. Nevertheless the INIS pattern is likely to be followed to a very considerable extent and, in particular, the technical aspects of the system are mostly borrowed directly from INIS. Thus the entire AGRIS experimental data base and demonstration output were constructed using computers and other facilities on which INIS material is regularly processed. There now exists - particularly in the IAEA, but also in several important national centres - a processing capability that can routinely manipulate large volumes of information in accordance with agreed international standards.

These standards have been developed partly in response to the needs of on-going systems such as INIS, and partly because of the efforts

of another United Nations organization, Unesco, in its attempts to establish a framework for continued international cooperation in the development of effective information systems. The Unesco program is usually known by the acronym UNISIST, and it is now leading to the establishment of a series of important common services that can help sustain INIS, AGRIS and other systems that may follow. For example, with the cooperation of the Government of France, UNISIST has established a centre in Paris which will build a register of the world's scientific and technical periodicals and issue common designators for these; this register will help ensure compatibility between computer systems and provide significant economies in computer records.

A NEW DEPARTURE: DEVSIS

Based on the progress of INIS/AGRIS/UNISIST, what should be the next move? International initiatives depend on international priorities. INIS came first, because the superpowers were looking for ways in which they could cooperate in the nuclear field and build up the trust and confidence that would lead to an eventual detente. AGRIS will be next because of the importance of food to all mankind. Ultimately such decisions are taken by governments, who either make money available or withhold it. Perhaps governments will be moved to action by the concern over the protection of the environment or by the current crisis in the supply of fossil fuels. However, it is the purpose of this paper to plead that the next international information system should respond directly to the needs of the vast international community of persons that is concerned with economic and social development - in planning and operating programs, in evaluation and in research.

The need for such a system has long been recognized. It was in 1968 that Sir Robert Jackson clearly identified it as a priority for the United Nations' development activities³. Anyone acquainted with programs of development aid is aware of the difficulty of obtaining information about what has gone before. Although there may be 300 or so regular journals devoted to development science and to the analysis of economic and social conditions in developing countries, far more information is buried in the mimeographed documents which are prepared as a result of studies, missions and projects - and many of these reports are not indexed by any existing system. The waste and duplication that results from inability to find already recorded information cannot be revealed until the information is found, but most professionals in the field of development believe that, if revealed, it would be staggering.

I propose that an effort should be made to build a co-operative information system with decentralized input/output making use of the organizational and technical experience of INIS and AGRIS and founded on the principles established by UNISIST. Tentatively, I call it DEVSIS, the Development Science Information System.

The mere proposal immediately raises practical questions: How will the system be designed in detail? Who will participate? What mechanisms can be established for management, co-ordination, and the merging of contributions of input? How will it be financed? How will the subject scope be precisely defined? Will confidential information be entered in the system and, if so, how will it be protected? How can we reconcile the various needs of developing-country authorities, development-aid organizations and multilateral

agencies? What outputs will be most useful?

These or similar questions would have to be asked about any new system that one proposed to create. The answers depend on the nature of the information to be handled and the needs of the various participants. It is not the intention of this paper to answer these questions: clearly, if we are speaking of a co-operative system, the co-operating partners must themselves determine the answers. The intention of the paper, however, is to assert that the technical problems are soluble - indeed that they have been solved already for INIS and AGRIS, and to express the view that the system can be built given the will, some time and some money.

Of these, the most important is the will. How anxious is the development community to have a system that will enable it to retrieve the information that it has itself recorded? How willing are the different components of this community - governments and agencies, donors and recipients - to share their information with each other? If they are prepared to pool their information for the sake of common goals, then the building of the system will probably take about one to two years for design and prototypes, and this phase may cost about \$400 000. Once implementation begins, participating agencies may incur costs of about \$10 for each item that they enter in the system, and central costs will probably be of the order of \$500 000/year. Each participating agency will, of course, have access to the files that are created and will incur output costs commensurate with the level of use that it makes of the system. An on-line retrieval system with a dedicated computer partition available throughout the working day may cost about \$200 000/year to operate (including salaries).

Those who make less frequent searches may be satisfied to retrieve information through the printed indexes at minimal costs.

Probably an important component of the system would be a back-up service of microfiche copies of the full texts of documents identified in the system. Assuming an adequate volume of processing this service should average out at a cost not exceeding \$1 per document received.

Considerable flexibility is available: input costs for the participants could be minimized if the central processing unit accepted input on worksheets and was responsible for making all microfiches. Central costs could be minimized if the participants provided their input on magnetic tape and did their own microfiching. In a mixed system (as indeed with INIS), the central processing unit could undertake more work for developing-country participants, while encouraging developed-country participants to carry a maximum amount of processing in their own facilities.

So far as is known, the proposal contained in this paper does not compete with any major existing effort. The UN Inter-Organizational Board for Information Systems and Related Activities (IOB) has a program to build a Common Register (CORE) of development projects, but what is proposed here is to build a common file of references to development literature. With the aid of a grant from my own organization (IDRC), the IOB has also experimented with the merging of files of references from several UN agencies, but has no immediate plans to extend this effort to all of the development literature. ILO, UNIDO, FAO and

IDRC have sought to build their own computer files to allow for eventual merging, and OECD (with financial help from IDRC) has worked on the elaboration of a thesaurus which could be used for identifying subjects within an information system of the type described here. Clearly these efforts would have to be taken into account in the design of a comprehensive new system, but would not determine in advance any of the decisions that would have to be taken by the community as a whole.

A SCHEDULE FOR ACTION

There are many different kinds of organizations that may be interested in a system to handle information about economic and social development:

- organizations responsible for national development plans and programs in developing countries
- organizations responsible for regional co-operation within groups of developing countries
- international development-aid organizations (including particularly the UN family of organizations)
- national organizations responsible for the development aid programs of industrialized countries, and organizations, such as OECD, which promote co-operation between these national organizations
- non-governmental and voluntary organizations which devote resources to development assistance (e.g. the member organizations of the International Council of Voluntary Agencies)
- academic institutions in both developed and developing countries which carry out research and training programs related to the science of economic and social development.

One of the difficulties that face us is to devise an instrument through which the interests of such a great variety of organizations can find

expression. Perhaps we should not hope to obtain the co-operation of all of them from the start of any program. However, we should obviously seek for as many as possible, and for a balanced representation of the different kinds of organizations that may participate in the eventual system.

If this paper elicits expressions of interest from a sufficient number of organizations, the first step might be to convene a meeting of representatives of these organizations to review the needs and priorities and to define what to do next. Hopefully such a meeting could be convened in the summer of 1974.

The details of what this meeting might recommend cannot now be foreseen. However, it is reasonable to suppose that it would set guidelines for the work of a design team. The team might be set up to carry out its work in the winter of 1974-75. It would be clearly desirable if this team could consist of individuals made available by organizations that expect to become major participants when a system is in operation.

Another meeting would probably be needed in the late spring of 1975 to review the work of the design team. If this work proved to be acceptable, then we can envisage a period of tests and prototype operations in the remainder of 1975. The system itself could begin regular operation from January 1976.

THE ROLE OF IDRC

The Statute of the Canadian Parliament under which IDRC was created states:

4. (1) The objects of the Centre are to initiate, encourage, support and conduct research into the problems of the

developing regions of the world and into the means for applying and adapting scientific, technical and other knowledge to the economic and social advancement of those regions

(2) The Centre, in furtherance of its objects, may exercise any or all of the following powers in Canada or elsewhere, namely the power to

(a) establish, maintain and operate information and data centres

Responding to the responsibilities imposed on it by Statute, the IDRC has organized its internal structure to identify "Information Sciences" as one of its four principal programs. Subject to approval by the Parliament of Canada, about \$4 million will be budgetted for "Information Sciences" in the fiscal year beginning 1 April 1974, significantly more than half of which will be available for commitment as grants to other organizations.

Believing that effective and rapid access to information is necessary as an aid to decision-making in all aspects of development work, the IDRC Division of Information Sciences identifies - as its first priority - the need for a world-wide computer-based system handling development information. As indicated in this paper, it would wish to see this system organized as a network of co-operating centres to respond both to the needs of developing countries and to the needs of multilateral and bilateral development aid organizations.

While IDRC is obviously prepared to commit some of its resources to assist with the development of the type of system described in this paper, it would not want to do so without the co-operation of other major partners. Given a sufficient expression of interest, it would be

prepared to underwrite the cost of holding an initial meeting. Its financial support of subsequent activities would depend on the level of involvement, in cash or in kind, of other potential participants. It believes that, ultimately, the system should be both managed and financed by the participants and beneficiaries.

IDRC sees that it can best respond to its own mandate by

- helping to get a discussion started about the need for a development information system and the form such a system might take.
- giving aid when needed to help overcome particular bottlenecks in the design and implementation of the system.
- assisting the developing regions to participate as full partners in the eventual network.
- operating, or helping to operate, a Canadian input/output station in the eventual network.

I intend to distribute this paper to as many as possible of the institutions that could be interested in a system to handle development information. I invite those who read it to send me their comments and suggestions.

REFERENCES

1. J. E. Woolston, L. L. Issaev, M. V. Ivanov, G. Del Bigio, The Design and Implementation of an International Nuclear Information System. Proc. IAEA Symp. Handling of Nuclear Information, pp. 607-619 (Vienna 1970); Charles W. Pelzer, Zhan Turkov, John E. Woolston, The International Nuclear Information System, Proc. 4th UN International Conference Peaceful Uses of Atomic Energy (Geneva 1971) p.683 (Vienna 1972).

2. Harry East, AGRIS Study Team Report, FAO document DC/AGRIS 2 (Rome 1971); G. Dubois, Un système international d'information pour les sciences et la technologie agricoles (AGRIS), Qu. Bull. IAALD, vol. 17, pp. 55-64, 1972; AGRINDEX Experimental Issue 513 pp. (Rome 1973).
3. R. G. A. Jackson, A Study of the Capacity of the United Nations Development System, document DP/5, Vol. II pp. 215-278 (Geneva, 1969).

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DEV SIS (1974) W.P.1

PURPOSES OF THE MEETING

- (a) to determine whether there is general acceptance of the need for a development information system; and, if so,
- (b) to define, in broad terms, the subject scope of such a system and the overall concept of organization and operation (e.g. decentralized input, centralized processing, decentralized output);
- (c) to consider possible mechanisms for management and financing (possibly in different stages); and
- (d) to recommend further action towards the detailed design of the system, including the terms of reference of a task force.

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DEVSIIS (1974) W.P. 2 Rev. 1

AGENDA

OPENING SESSION (Chairman: Dr. W. David Hopper, President IDRC)

(1) Welcome Statements

IDRC (Dr. Hopper)
National Librarian, Canada (Dr. Guy Sylvestre)
Unesco (Dr. Adam Wysocki)
OECD (Mr. Giulio Fossi)

GENERAL SESSION (Chairman: Mr. Raymond Aubrac)

(2) General discussion on the need for a system to handle
development information

- Devsiis - Mission oriented*
- (a) Review of previous initiatives (Mr. Giulio Fossi, Mr. G.K. Thompson)
 - (b) Introduction of DEVSIIS proposal (IDRC-doc-041, Mr. John E. Woolston)
 - (c) Invitation to those participants who wish to make initial presentations of their views
 - (d) Discussion and Chairman's summary

(3) Status of UNISIST and of existing systems

- (a) UNISIST (DEVSIIS (1974) W.P.4, Dr. Adam Wysocki)
- (b) INIS (DEVSIIS (1974) W.P.6, Dr. Vassil Gadjokov)
- (c) AGRIS (DEVSIIS (1974) W.P.7, Mr. Harry East)

(4) Description of a possible system (DEVSIIS (1974) W.P.3)

- (a) Subject scope
- (b) Input sharing, mechanisms for assembling input
- (c) Processing
- (d) Output (users, products)
- (e) Management and finance

*Dev Imp. Service, OECD
SID, Pan taken it over
Rice*

*Wignarajah - political
admin, technical
as well as Ec + Soc.*

today

(5) Practical measures

- (a) Further studies, how should they be organized?
- (b) Terms of reference for a task force to elaborate the design; composition of the task force.

(6) Appointment of Drafting Committee

(7) Adoption of Recommendations

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DEVIS (1974) W.P.3

WORKING PAPER OFFERED FOR DISCUSSION
UNDER ITEM (4) OF THE AGENDA

(a) Subject Scope and Coverage

The definition of subject scope is perhaps the most important key element in the design of an information system. Following its definition, one can begin to make estimates of the quantity of information to be handled, not only in the system as a whole, but within the territory of each input centre. Also, it is only after the subject scope has been defined that one can begin to build the subject control system (classification codes and/or thesaurus) that would be appropriate.

The subject scope needs to be defined with a considerable degree of precision. The analysts who scan literature to determine what should be reported to the system need to make yes/no decisions, and these become very difficult if the subject scope is loosely defined; similarly retrieval is complicated when the data bank contains an uncertain quantity of material in a penumbra around the central themes.

For initial operation of the system, the subject scope adopted might be comparatively narrow, with the option of expansion when the system is running smoothly. This two-step approach to the subject scope was, in fact, adopted for INIS.

Given that perhaps several pages of precise definitions must be written, it is clearly not going to be possible to undertake this task at the meeting in June 1974. This work might, however, be assigned to a task force, but the task force would probably need some general guidelines from this meeting.

If DEVSIS is accepted as a mission-oriented system - information that would be useful in economic and social development - this can immediately provide us with a first guide and steer us away from a purely disciplinary approach. We would not say that "Sociology", "Economics" or "Demography" are covered by the system, but only those aspects of such disciplines which relate to the mission, i.e., to development.

Even so, "economic and social development" is an extremely broad concept. As often conceived it can take in information dealing with such areas as engineering, agriculture, public health, education - even atomic energy. We should find a way to avoid having to take in this type of information; otherwise DEVSIS would be attempting to encompass a vast quantity of sectoral material better left to information systems in these sectors.

To begin with, we might exclude that information which is purely technological in nature. Thus, information about the fertilizer response of a new variety of rice - even though this is ultimately extremely important for development - would be excluded from DEVSIS and be left for AGRIS to pick up. Similarly, we might exclude other specialised fields, particularly those covered by existing information services. However, to concentrate on that which is central to our defined mission, we may need also to exclude some specialized areas, such as "preventive medicine" and "educational methodology" even though there may be doubts about the adequacy of existing services in these fields.

Given acceptance of the positive criterion "the development mission" and the negative criterion "no sectoral information", we still have a potentially vast quantity of literature for the system. In view of world priorities, DEVSIS might be defined to have an

initial subject scope limited to "the development mission of the Third World". This would be without prejudice to its possible future expansion to deal with the economic and social development of the entire world.

We can now perhaps proceed to the identification of a short list of broad topics for further elaboration by the task force, e.g.:

- (1) descriptions of the economic and social conditions of the developing regions of the world, at both the macro- and micro- levels;
- (2) the theory of development; prognoses of future conditions and recommendations for action;
- (3) development policies and development plans; studies for programs and projects;
- (4) the development experience, particularly the organizational, administrative and financial aspects;
- (5) the economic and social consequences of development efforts and of other changes in the world's economic and social parameters;
- (6) international co-operation in development endeavours.

In the jargon of information systems, we shall need to define "coverage" as well as "subject scope". Do we "cover" only published literature, or do we also attempt to "cover" mimeographed reports, theses, audiovisual material, etc. Again the task force will benefit from the guidance of the June meeting.

(b) Input sharing

The organization of INIS provides a neat and equitable formula for the sharing of input responsibilities: each participating nation agrees to report the literature that is published in its own national territory. Nations that are large producers of atomic-energy information are likely also to be nations that have large atomic-energy programs, and thus each nation accepts a workload that is likely to be roughly proportional to its resources. Also large producers of information are likely to be large users of information, and to derive benefits that compensate for their efforts.

Apart from its inherent fairness, the INIS formula has other advantages. A national institution is likely to be in the best position to identify and evaluate the national literature; a foreign institution would have much more difficulty in identifying all the sources, and it could easily be embarrassed by the task of making value judgments. On the other hand, a national institution is strongly motivated to make value judgments, and to weed out trivial and unreliable literature in order to protect national prestige in the eyes of the world at large. It has the capacity both to find the best and to reject the worst.

To some extent the INIS formula has been modified for AGRIS, and it may need even further modifications for DEVSIS. However, the INIS formula is still likely to provide a good starting-point for defining a DEVSIS formula.

The problem can probably be most conveniently discussed under three main heads:

- 1) Literature produced in developed countries
- 2) Literature produced by international organizations
- 3) Literature produced in developing countries

For developed countries, the INIS formula probably needs no modification. Each participating nation would be invited to identify an input centre which would undertake responsibility to scan production from all national sources (academic, governmental etc), to identify relevant journal articles, monographs etc, and to report these to the system. Some participating nations might wish to join together and submit their input through a regional centre.

In atomic energy, the IAEA itself is the only international organization producing a large volume of relevant literature. It has undertaken to report, not only its own production, but also the production of other international organizations; this addition represents only a small increase to the IAEA's workload, and it would be obviously uneconomic for WHO, ILO etc to set up separate INIS input centres to cover their own small production of atomic-energy material.

This however, would not be the case for DEVSIS. Many international agencies are large producers of development information, and it is likely that these would need to have their own separate DEVSIS input capabilities. However, some agencies have development interests that are more sectoral than central, and they may choose to allow their DEVSIS input to be handled by a sister agency that is already participating.

Those developing countries that wish to participate in the early operation of DEVSIS should be given every encouragement, and development-aid organizations should help to ensure that they acquire the resources to make effective national inputs. Several developing countries, some with the assistance of UNDP, FAO and Unesco, have already established national documentation centres; there are already collecting relevant national material and, with the authority of their governments, would be the logical partners in DEVSIS operations. Other developing countries may prefer to wait until the system reaches a certain maturity before making a national commitment. The input of the literature produced in these countries could conceivably be handled, at least on a temporary basis, by regional organizations.

(c) Processing

Under this heading, the June meeting may wish to consider several technical alternatives, but probably will need to leave the choice between these to a team that will have sufficient time to make a detailed analysis.

At the input centres, the information to be recorded in the DEVSIS file will first be inscribed on an appropriate worksheet. INIS continues to accept such worksheets at its central processing unit, even though it encourages its input centres to convert the worksheets to either paper tape or magnetic tape. AGRIS seeks to have all its input on magnetic tape.

Technological advances should be watched because there are distinct possibilities for cost savings, particularly at the input centres. "Optical character recognition" (OCR) has developed substantially since the INIS design decisions were made. Most major typewriter manufacturers now offer machines with characters that match the ISO specifications for OCR work. INIS, because of the quantity

of mathematical expressions found in atomic-energy literature, opted for a large character set; however, AGRIS has accepted - and DEVSIS probably could accept - the character set for which ISO has established its 7-bit code. This allows for upper- and lower-case characters, but no diacriticals.

If the use of OCR can be satisfactorily demonstrated, it would permit substantial economies of investment at the input centres. The only machines needed there would be typewriters, and we could select a model that is marketed and serviced on a world-wide basis. This would ease remarkably the participation of developing countries.

Whether on worksheets, paper tape or magnetic tape, the input of the various participants would need to be mailed to a central processing unit. Here the input would be checked and merged, and the DEVSIS data base would be constructed. INIS experience would permit us to make a reliable assessment of the amount of work to be done at the central processing unit, and the likely costs of this.

Because much of the development literature is not formally published, but exists only in the form of mimeographed institutional reports, we would probably need to set up a procedure for collecting the full texts of unpublished literature reported to DEVSIS and copying these for distribution to the users. INIS experience shows that this task can be handled in a reasonably satisfactory way by making microfiches of the unpublished literature at the central processing unit. Once a master microfiche exists, the costs of copying from this master are low, and mailing such copies is also sufficiently inexpensive that airmail can be used.

One important question needs to be settled because of the work that it involves both for the participants and for the central processing unit: should each record be accompanied by an abstract? INIS requires an abstract, AGRIS Level One does not. If abstracts are to be included, should they be handled separately (INIS issues them on microfiches) or should they constitute part of the computer record? It may be difficult for a task force to resolve such questions, and it would be useful to have an expression of opinion from the June meeting as to the need for abstracts in a DEVSIS data base.

Similarly the question of subject control deserves discussion. INIS uses a structured thesaurus with about 20 000 descriptors. AGRIS Level One is planning to employ a fairly coarse classification scheme combined with a collection of terms that identify economic products. Terminology in the social sciences is not as precise as it is in the natural sciences, and this will pose problems for both indexing and retrieval. The June meeting may want to review experience with existing tools, e.g. the OECD Macrothesaurus and offer tentative guidance for subsequent design studies.

(d) Users and products

If we have accepted that DEVSIS is a mission-oriented system, its usefulness will be determined by the extent to which it contributes to the development process. Will the existence of DEVSIS lead to the establishment of more effective policies and the taking of more effective decisions? Its ultimate target audiences are, therefore, the people who make policies and take decisions - first, in the governments of developing countries and, second, in the administration of development-aid agencies.

But these are busy people, who often have little time for reading journal articles and reports. If DEVSIS is really effective in identifying the information that is the most relevant for any given user at any given moment, then it may lead even very busy people to read the information for themselves. But most of the time, such people will probably continue to depend on staff papers - so we can identify our immediate target audiences as the people who serve on the staff of policy-makers and decision-makers; to these we should add the academic community that is involved in research and teaching directly related to the development process.

Fears have been expressed that a system such as DEVSIS will only place more paper on the desks of people who do not have time to read the documents already there. Proponents of DEVSIS must be prepared to respond to criticism based on these fears.

Why is there so much paper on our desks? Possibly we keep it there because, if we cleared it away, we would have no assurance

that we could find it again when we needed it. But if we did have an effective information retrieval system, we would have no need to keep paper on our desks; we could just call for what is relevant to the problems of the day.

Also we often find ourselves reading documents that are somewhat relevant to our needs, but not entirely so. We are not sure that they contain the information we need, but perhaps they do (in any case we have no way to check what else may exist) - and so we persevere only to be frustrated when we find that our reading has not helped us much. We would read much more willingly if we had some assurance that the document in our hands contained the information that best responded to our needs. And an information system should give us just such confidence.

A user should be able to go to the system, define the subject that interests him, and be given a list of possible titles. There may perhaps be fifty of these; if there are many more than this, the user immediately knows that he must define his subject more precisely. But he can run through fifty titles, eliminate those that are not of interest. Next, he would probably like to ask for abstracts of these dozen items and, after reading the abstracts, select one or two documents that he would like to see in full text. He can then give his time to reading these texts with a high degree of confidence that he has found what is the most appropriate out of the entire population of documents that are available to him.

The output products of DEVSIS should be tailored to provide the sort of service that will enable our target audiences to select their reading material with confidence. The larger groups of users may wish to invest in computer facilities to permit nearly instantaneous retrieval of information. Smaller groups will want to select with the same degree of precision but, in the absence of computer facilities, will take the time needed to search through printed indexes. INIS and AGRIS provide printed indexes (Atomindex and Agrindex), and we should probably assume that DEVSIS will produce a printed Devindex at, say monthly intervals with annual

cumulations of the main search tools. The cost of such an operation could be defined on the basis of INIS experience.

Possible DEVSIS output products are therefore:

- Increments of the data base on magnetic tape
(for computer installations)
- A printed Devindex
- A file of abstracts (on magnetic tape? or
microfiches? in Devindex?)
- A service of microfiche copies of full texts

(e) Management and Finance

If the preparation of input is decentralized, it may perhaps be assumed that each participating institution will manage and pay for its own local operations. Similarly each user institution will presumably be responsible for the organization and financing of its own work in exploiting the DEVSIS output products. Developing countries may look for technical assistance to support their efforts on both input and output, but such assistance could be provided separately from the budget for the DEVSIS central processing and co-ordination unit.

The location, management and financing of the central processing and co-ordination unit will eventually need to be defined. It will be extremely useful to discuss these questions at the June meeting, and to identify some possible answers - probably several alternatives. Certainly any task force will need to be guided by the opinions of the June meeting on what is likely to be acceptable to the community of organizations involved.

Other questions that might be considered under this topic of the agenda may include:

1) The handling of 'confidential' information

Many individuals have pointed out that much of the valuable development literature is produced with markings that restrict its availability. While all accept the need for such markings for particularly sensitive material, many individuals feel that mechanisms

exist or could be developed to minimize the effects of these markings on the flow of non-sensitive information. Their suggestions could be considered.

2) The special role of developing countries
in the DEVSIS operation

The INIS - AGRIS experience indicates that participants will not all join simultaneously, and that some will join only when a sufficient momentum has been demonstrated. If each potential participant were to wait for all the others to declare their involvement, nothing would get started; some must take leadership. What is the minimum assurance that the leaders will need before making their commitments?

In a case like INIS, the major participants are also super-powers and, when they agree, there is good reason to begin. But DEVSIS declares its primary objective as being of service, not to super-powers, but to the governments of developing countries. The June meeting may wish to give particular attention to the mechanisms that might be established to facilitate the participation of developing countries in the design, management, operation and utilization of the system. Clearly DEVSIS should continue beyond an experimental phase if - and only if - the developing countries indicate that it responds to a felt need and that they are making use of it.

Meeting on the
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FOR THE DEVELOPMENT SCIENCES (DEV SIS)

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UNISIST PROGRAMME

ITS ROLE IN INTERNATIONAL COOPERATION IN SCIENTIFIC
AND TECHNICAL INFORMATION

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INTRODUCTION

In the present development of information policies and information systems, a clear distinction could be made between macro and micro models of information programmes or systems; both are serving to meet the needs of users but in different ways.

The macro model usually is not operational and does not directly provide information or quantitative data to the users. It does, however, provide the necessary tools and a conceptual framework within which the operational micro models could be developed.

UNISIST is to be considered as a macro model on a world-wide basis. It is a continuing, flexible programme based on a joint Unesco-ICSU study with the aims: to co-ordinate existing trends towards co-operation and to act as a catalyst for the necessary developments in scientific and technical information; to develop the necessary conditions for micro systems interconnection and to facilitate the access to world information resources. The ultimate goal is the establishment of a flexible and loosely-connected network of information services based on voluntary co-operation. UNISIST is concerned initially with the basic sciences, applied sciences, engineering and technology but it will be later extended to other fields of knowledge. Within the general conceptual framework of UNISIST and in accordance with its recommendations, several operational systems were developed. As examples, the information systems AGRIS and INIS could be cited.

The UNISIST work plan, developed in accordance with the recommendations of the Intergovernmental Conference held in October 1971

and approved by the 17th session of the General Conference of Unesco in 1972, comprises five main objectives:

1. Improving Tools of Systems Interconnection
2. Improving the institutional components of the information transfer chain
3. Developing Specialized Information Manpower
4. Developing Information Policy and National Networks
5. Special Assistance to Developing Countries

At the initial stage of the programme development, two priorities were established, namely:

- a) Projects dealing with the improvement of tools of systems interconnection;
- b) Projects related to technical assistance to developing countries, especially in training and education.

For the supervision of the programme development, two managerial bodies were set up - the UNISIST Steering Committee composed of representatives of 18 Member States, and the UNISIST Advisory Committee representing the interests of scientists, engineers and information specialists.

In my report I should like to describe the UNISIST activities of a conceptual, normative and operational nature directed towards the creation on an internationally acceptable framework for cooperation in the field of scientific and technical information.

In the relatively short time I have at my disposal, I cannot enumerate all on-going efforts developed within the UNISIST pro-

gramme and I shall, therefore, concentrate on some examples which seem to be of most importance. All those who are interested in more detailed information on the development of UNISIST can find the necessary information in the UNISIST Newsletter which is published in English, French, Spanish and Russian.

The UNISIST efforts towards harmonizing and harnessing international cooperation can be grouped in four sections:

- a) Action towards development of national, regional or international information policies;
- b) Action towards improvement of institutional and normative components of information transfer;
- c) Action for development of specialized information manpower;
- d) Assistance to Member States for the creation and development of their information infrastructure.

I. DEVELOPMENT OF NATIONAL, REGIONAL AND INTERNATIONAL INFORMATION POLICIES

These form the first group of UNISIST activities. The main attention is focussed on raising the level of awareness of scientific and technical information as a motivational force in scientific and socio-political development through:

- the establishment of National Focal Points and UNISIST National Committees and the formulation of information policy objectives;
- development of plans for long term information policy.

1. Establishment of National Focal Points and UNISIST National Committees

The successful implementation of the UNISIST programme depends to a great extent on the active participation of Member States, who can make a positive contribution to it by encouraging and supporting the application of the UNISIST principles and guidelines in their countries. For the purpose of this programme, the General Conference of 1972 recognized the need for Member States to create the National Focal Points and UNISIST National Committees to be responsible for ensuring their maximum participation in this programme. It was on the basis of this recognition that the Director-General invited the Member States to establish such focal points and National Committees.

A National Focal Point should be a governmental agency with the aim to guide, stimulate and co-ordinate the development of information resources and services in the perspective of national, regional and international cooperation.

The broad function of a UNISIST National Committee is to advise the national focal point and other cooperating organizations on all aspects of participation in UNISIST. Its main activities comprise:

1. at the policy level: participation in the UNISIST Conference and in the work of the Steering Committee;
2. at the action level: monitoring UNISIST progress and national developments for communication to UNISIST, responding to UNISIST initiatives in various forms, and taking national activities as specific contributions to UNISIST. The membership of UNISIST National Committees should represent the interests of governments as well as the communities of scientists, engineers and information specialists.

great gaps in our knowledge about the effects of the application of information are being discovered. It is now becoming more and more clear that information policy must seek to ensure that the world's professional and specialized knowledge is fully and properly used in guiding social evolution. The information requirements of policy makers, planners, managers and those faced with the increasingly important social problems of today and tomorrow are becoming critical. UNISIST action in the field of long-term policy development, monitoring and forecasting is being developed in three directions:

First, exploratory studies are being undertaken, partly under contract, on the development of a long-range plan and programme for information policies as they inter-act with changing societies. The studies will comprise outlines of the nature, function and scope of information; information and the decision process, with particular reference to government; government, public policy and the information function; social development and the enrichment of the individual, and the need for dynamic task orientated information processes. The studies are aimed at practical programme development in this increasingly important field.

A second direction in which action is being undertaken has as its purpose to add to the knowledge of information and its significance for the present and the future society by:

- a) studying the effects of the application of information and information technology and the interaction between such application and socially significant situations;
- b) developing indicators and values for the "knowledge industry" and for information technology assessment,

primarily on the bases of collected statistics ("Infometrics") on the need, usefulness, economic and social value, degree of utilization, processing, production, etc, of information;

- c) designing comprehensive and responsive models of the growth of knowledge which can be used to predict action requirements in a given situation and/or in response to specific external or internal pressures.

A third direction, at present under preparation, is oriented towards the recognition of the growing importance of legal and economic problems, in particular proprietary, cost and pricing aspects of information policy. Much study has been carried out already on these issues by several organizations and individuals. However, in the context of the UNISIST Programme, concrete agreement between Member States on these important issues is aimed at. In view of this objective, a preliminary survey of relevant issues is being worked out as a basis for studies on the financial, economic, administrative and legal aspects of a scientific and technological information policy. The results of these studies will be used for the development of rules, regulations and codes for international use in order to overcome existing barriers in information transfer.

So much for the examples in the field of information policy undertaken or planned within the UNISIST Programme.

The second main group of actions of the UNISIST Programme is directed towards:

II IMPROVEMENT OF THE INSTITUTIONAL AND NORMATIVE COMPONENTS OF INFORMATION TRANSFER

Within this section several examples should be mentioned which are of essential importance for the creation of a general framework

for international cooperation between information micro-systems.

The strategy followed in this area is to select activities with a multiplier effect; that is activities which will themselves generate further actions with additional benefits in the same direction.

1. Manual for Systems Interconnection

The UNISIST Steering and Advisory Committees, based on the proposals made by the special working groups, recommended to the UNISIST Secretariat that a UNISIST Manual for Systems Interconnection, within the UNISIST series of Information Handling Procedures, be prepared for a suitable packaging and dissemination of information about standards, rules, guidelines, directives and other means of a normative character relevant to systems interconnection.

The Manual will be conceived for all kinds of users such as authors, editors, publishers, abstracting and indexing services, specialized bibliographic libraries, clearinghouses, information centres, book trade and subscription agencies, data banks and evaluation centres, information consumers, referees or reviewers.

Five main areas will be covered by this Manual:

- bibliographic descriptions;
- conceptual treatment of documents (abstracting, indexing, classification, terminology);
- presentation of documents or elements thereof;
- documentary reproduction;
- mechanical treatment.

The content and the presentation of the Manual will take into account a differentiation of machine and manual treatment of infor-

mation. It is a long-range project and will be carried out phase by phase.

2. Reference Manual for Machine-Readable Bibliographic Descriptions

The Reference Manual, prepared by the UNISIST/ICSU-AB Working Group on Bibliographic Descriptions, represents the results of some three years work by an international group brought together within the framework of UNISIST. It will form an essential part of the Manual for Systems Interconnection.

The scope and purpose of the work has been to define, for most types of scientific and technical literature commonly covered by secondary information services, a set of data elements which may be regarded as constituting an adequate bibliographic citation. For each type of literature, an essential minimum set is identified, together with additional supplementary elements and agreed upon by abstracting and indexing services to facilitate the exchange of information between services, and to enable them to present their computer-based products to the user in a more compatible and therefore more easily usable form. It is hoped that this Manual will also find other applications in the wider field of information.

The final version of the Manual is at present being translated into French, Spanish and Russian and will be published shortly.

We are also preparing within this group of activities:

3. Broad System of Ordering (BSO)

The need for the establishment of a BSO within the UNISIST Programme comes naturally as one of the aspects in the process of

achieving compatibility between existing and future information systems. Mindful of the great diversity of classification schemes used in the world, it can be stated that a main function of Broad System of Ordering is not that of a classification in its own right, but to serve as a switching mechanism to link different individual classifications and thesauri in the process of information transfer.

A special working group was set up together with FID in order to design and develop a broad subject ordering scheme for all fields of knowledge usable in mechanized and manual systems. The first results of this WG are not too satisfactory but we hope that the work will be improved and that the draft of BSO will be submitted to the World Classification Conference in Bombay in 1975 for consideration.

4. UNISIST International Serials Data System

The International Serials Data System (ISDS) is an international network of operational centres, jointly responsible for the creation and maintenance of computer-based data banks and illustrates UNISIST effort in the improvement of information transfer.

The objectives of the ISDS system are:

1. To develop and maintain an international register of serial publications containing all the necessary information for the identification of the serials;
2. To define and promote the use of a standard code (ISSN) for the unique identification of each serial;
3. To facilitate retrieval of scientific and technical information in serials;

4. To make this information currently available to all countries, organizations or individual users;
5. To establish a network of communications between libraries, secondary information services, publishers of serial literature and international organizations;
6. To promote international standards for bibliographic description, communication formats and information exchange in the area of serial publications.

The ISDS International Centre is established in Paris by agreement between Unesco and the French government.

The ISDS-IC is establishing an international file of serials from all countries. This file will be limited, initially, to scientific and technical publications, and will be gradually extended to include all disciplines.

Each serial will receive an International Standard Serial Number (ISSN) which has been developed by the International Organization for Standardization (ISO).

At the moment, over 40 National or Regional Centres have been established. The first list comprising about 35,000 serials will be ready this summer.

5. Data for Science and Technology

Another example of UNISIST efforts for the improvement of information transfer is the study and plan of actions developed jointly with CODATA on accessibility and dissemination of data for science and technology.

The goal of the study is to give a realistic picture of the situation in the field of the evaluation, compilation and dissemination of reliable data, to analyze existing deficiencies and gaps and to develop recommendations for future action, paying special attention to the needs of developing countries.

The report defines three functions needed to provide accessibility to scientific and technical data:

- data evaluation and compilation service
- data dissemination service
- data referral service

In accordance with this subdivision of functions a global scheme or network for dissemination of S & T data is proposed.

Within this scheme,

- 1) Data evaluation centres are differentiated by disciplines or problems and only one (or a limited number) of them is active in a given scientific area. This means that they can be the sources for the supply of data of high quality on a world-wide basis. It is therefore suggested that no country, however big it is, will possess data evaluation centres in all disciplines.
- 2) Data dissemination centres have the responsibility for handling a broad range of scientific and technical disciplines and use the products of data evaluation centres as input.

The output from data evaluation centres may be often used directly by the users, but, in addition, such a centre should supply data to a wider range of users through data dissemination centres.

Every country should have, in principle, a data dissemination

centre, so that a domestic user can communicate with it easily, but it may, however, be appropriate to create a regional data dissemination centre. In contrast to data evaluation centres, data dissemination centres are not restricted in specialization, but cover a wide area.

A data dissemination centre may offer the following services:

- (a) to collect published compilations of evaluated data and to offer them for reference use;
- (b) to search particular data on requests from collections of data centres and other data dissemination services;
- (c) to provide current awareness services;
- (d) to assist users in identifying where to find required data.

3) The global referral Centre directs users' enquiries for data to the sources capable of supplying the needed material.

The basic problem, leading to the necessity of the creation of the global referral Centre, is that reliable data compilations, prepared at substantial cost, are in many cases not accessible to users promptly enough to permit their application where needed. In some instances this lack of accessibility is due to the user's ignorance about the existence of the needed compilation; in others, he may be aware of its existence, but does not know how to get it.

This does not, however, necessarily mean the establishment of three new organizations for each scientific or technical discipline or subject, but calls for the use and expansion of all present facilities.

Similar efforts are foreseen to develop a general framework for Information Analysis Centres.

The next group of UNISIST activities which received very high

priority is:

III DEVELOPMENT OF SPECIALIZED INFORMATION MANPOWER

The aims of this action, mainly designed for developing countries - but also important for developed countries - are:

- Harmonizing international assistance programmes in training and education;
- To prepare basic handbook for information specialists, a manual for the training of users, guidelines and curriculum material;
- To organize specialized course for teachers and managers of information systems and training courses for information specialists.

1. Harmonizing International Assistance Programmes in Training and Education

In order to move away from the sporadic, haphazard and unsystematic approach which often characterizes international technical assistance efforts, there is a strong need for international co-ordination of assistance programmes in the field of training information specialists.

A general plan of action was established within the UNISIST programme. This plan does not concern the harmonizing of teaching programmes themselves, but rather the harmonizing and promotion of international assistance programmes provided by UN Agencies, international organizations, non-governmental organizations, national organizations and private foundations in the area of training and education and in the field of scientific and technical information and documentation.

It comprises five points:

1. The recognition of an international focal point or forum for coordination;
2. The establishment of a clearinghouse or a network of organisms with a clearing function to collect and disseminate up-to-date evaluated information in the field of training and education in documentation;
3. Periodical meetings of bodies involved in international assistance programmes;
4. A liaison bulletin between interested parties for fast diffusion of information, and
5. An advisory function on policy, in the form of guidelines to developing countries.

To implement this plan, the UNISIST Steering Committee decided to set up an ad-hoc committee to review the policy in the field of education and training of information specialists and to prepare a long-term programme of work in the light of experience gained with the projects initiated within UNISIST.

2. Guidelines for Organizing Training Courses, Seminars, Workshops, and Refresher Courses in Documentation

A draft set of guidelines is being prepared for organizing training courses, seminars, workshops and refresher courses in documentation and information services for practitioners, users and teachers. These guidelines will be conceived in particular for the needs of developing countries and therefore will be circulated in draft form to organizers of such educational programmes in developing countries to ensure their practicability in final form for future planning of such programmes. The draft guidelines for review and revision will be edited by Unesco Secretariat.

The guidelines will cover inter alia the following items:

- a) Advanced preparation of such programmes (determination of need for course, objectives, potential audience, sponsorship, site co-ordination with other educational activities, etc.).
- b) Planning of course (publicity to potential participants, criteria for selection, establishment of screening committee, accommodations for programme, outline of topics, teaching modes, etc.).
- c) Programme activities at the time of course (language of instruction, reading materials, adjustments in topical outline and student activities, etc.).
- d) Post-programme activities (evaluation, follow-up of students, reports, etc.).

3. UNISIST handbook for Scientific and Technical Information and Documentation Services

It is conceived to provide information workers and students in developing countries with an easy-to-use, ready-reference, up-to-date description and discussion of information services, systems resources and related topics in information science and documentation. The user should be stimulated to design or improve existing services in his country with the aid of a generalized blueprint he can follow with modification to fit the particular needs in his environment. Emphasis will be put on systems analysis, design and evaluation, with practical considerations, easy recipes, references and useful addresses. The user should either find the information he needs in the handbook or should be able to find out where the information is. Part of the Handbook is scattered in a number of publications but none of which have been written with the specific audience of developing countries in mind.

4. The UNISIST Manual for the Education and Training of Users of Scientific and Technical Information

This is a guide for teachers and information specialists responsible for organizing and running courses, seminars or workshops mainly in developing countries. It is not a guide for the users themselves; it can only serve as a basis for organizing programmes for the education and training of users both in the form of a basic education course for students at University level and as a training workshop for practitioners. It will be conceived in such a way as to provide the organizer of a programme with enough guidance and information to tailor-make a short course for the needs of a specific group. The manual will provide a methodology, indicate alternative approaches but will have to be adapted by an instructor to a specific audience knowing the level and the subject speciality. The Manual will be accompanied by a kit containing case studies, useful guidelines to bibliographic tools and other relevant published material. Training activities is a sub-group of UNISIST operational activity. The following courses organized this year could be mentioned as examples:

5. The International Training Course on Information Retrieval Systems at the Centre of Technological Development in Katowice, Poland

This course will be given from 4-24 August 1974 for teachers from developing countries. It will aim at providing the participants with sufficient knowledge on the subject to allow them to organize in their respective countries a similar course adapted to the particular needs of the country. It will consist of lectures, practical exercises, group discussions and training on "how to teach".

6. The Course on Networking and Systems Compatibility

This course, organized in conjunction with the Japanese National

Commission for Unesco in July and August 1974 will be tied with the regional information network for science and technology for South Asia and is designated for the participants from that region. In essence it will comprise:

- a. Background on networking, theory, organization and technology;
- b. Case studies including results of the Unesco/UNDP Southeast Asia project, and
- c. Compatibility aspects (Manuals of ISDS, ISBD(M), ISBD(S), INIS, AGRIS and related UNISIST guidelines).

The last group of activities which I would like to describe relates to:

IV ASSISTANCE TO MEMBER STATES FOR THE CREATION AND DEVELOPMENT OF THEIR INFORMATION INFRASTRUCTURE

The purpose of this activity mainly oriented towards developing countries is as follows:

- to review national requirements in scientific and technical information;
- to advise on and to assist in the establishment of national or regional scientific and technical information services;
- to conduct the pilot projects with the aim to assess effective approaches for linking the countries with existing information services.

Pilot Projects

Four regional pilot projects are being initiated in 1974 and will be continued through 1975. Through these projects, new information approaches in different developing regions will be tested to gain experience in the way in which the information services under study and their users respond. In each case, therefore, an evaluation will be carried out.

The practical outcome of the proposed projects is expected to be:

- a. The alerting of potential users in the regions involved to the availability of information services such as SDI and current awareness;
- b. Knowledge of user reaction to the services now available;
- c. Feedback of evaluated user reaction to the services in question in the hope that it might be improved (if and where any remediable weaknesses are found) in case the service is being continued after the pilot project as a regular service in the region.

In two cases, the pilot projects considered aim at the establishment of computerized SDI services offered initially to 100 users on the basis of 1-2 magnetic tape systems in a field of interest.

In both cases, the establishment of the SDI services will be based on Canadian assistance. The National Research Council of Canada, through the National Science Library, will provide the CAN/SDI software, the staff expertise required and the training needed for the two pilot projects.

Accordingly, agreement has been reached with the INSDOC and the Indian Institute of Technology of Madras for such a CAN/SDI based project in India and a couple of neighbouring countries.

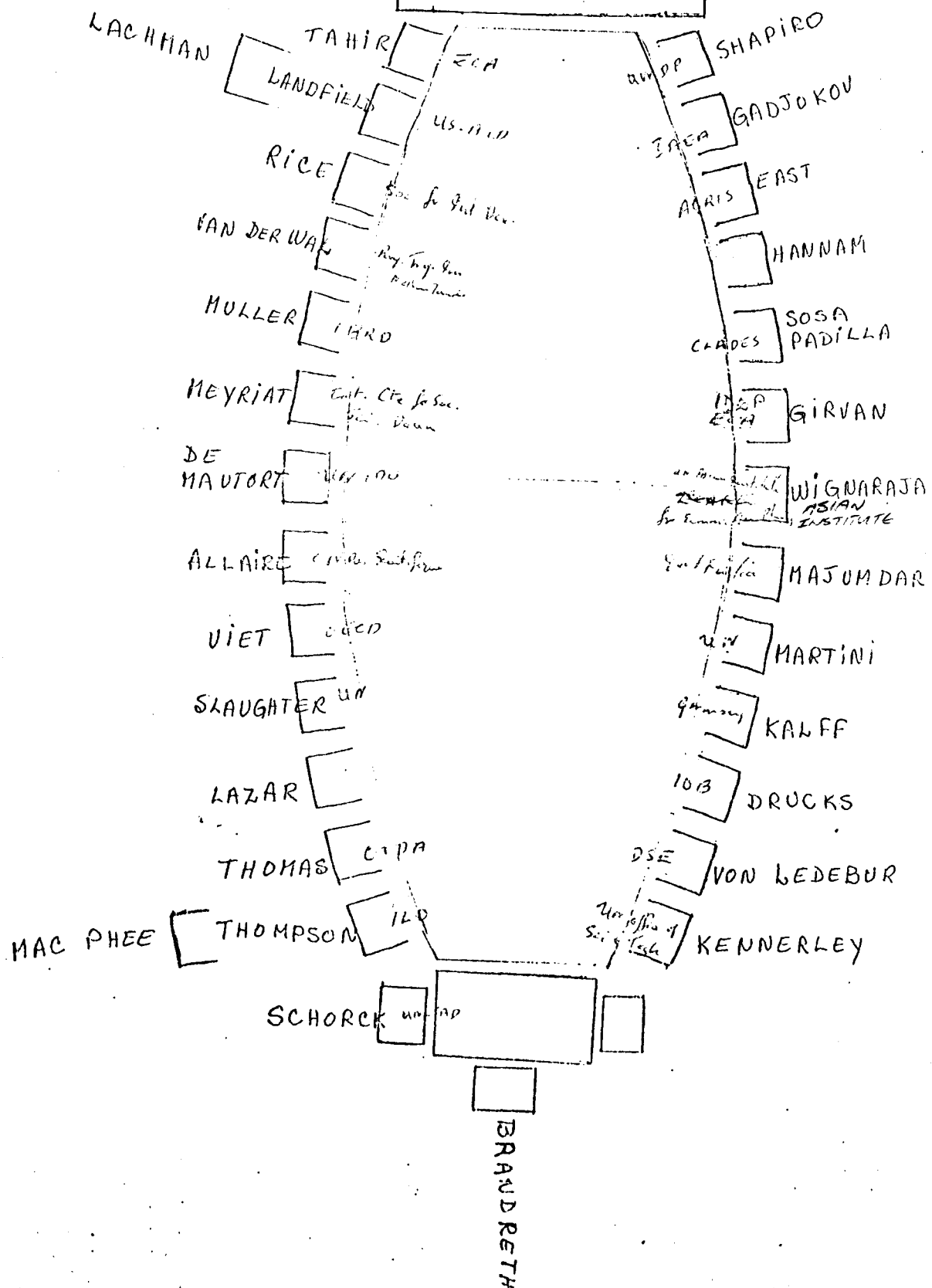
A similar CAN/SDI-based project in a region in Latin America is centred in Argentina and carried out at CONICIT in collaboration with the Centro de Computación Facultad de Ingeniería.

Another regional pilot project aims at creating a manual current awareness service in a region of Arab States. In this case, it is envisaged that the current awareness service in Arab States, in a

field of interest to the region, will be based on weekly cards with abstracts of new articles which are mailed from an abstracting and indexing institution to a documentation centre in the region with further dissemination from that point to the participating countries.

The fourth regional pilot project is expected to involve the establishment of a central data bank in Africa for the storage, analysis and dissemination of information on various imported or local technologies.

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Meeting on the
FEASIBILITY OF AN INTERNATIONAL INFORMATION SYSTEM
FOR THE DEVELOPMENT SCIENCES (DEVSIS)

Co-sponsored by the
International Development Research Centre
the Organization for Economic Co-operation and Development
and Unesco (within the framework of its UNISIST program)
OTTAWA, 11-13 JUNE, 1974

DEVSIS (1974) W.P. 5 Rev 2

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DEVSI (1974) W.P.5 Rev.3

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FEASIBILITY OF AN INTERNATIONAL INFORMATION SYSTEM
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INIS: A FEASIBILITY EXAMPLE OF A MODERN INTERNATIONAL
INFORMATION SYSTEM WITH DECENTRALIZED INPUT PREPARATION

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International Atomic Energy Agency

Vienna, Austria

1. INTRODUCTION

In May 1970 the first issue of INIS Atomindex came off the press. One month before that it was prepared in magnetic tape form and distributed among the INIS participants. This more-than-modest information bulletin contained a mere 147 bibliographic entries classified by subject category but not provided with subject descriptors. It hardly excited a ripple of interest either in scientists and engineers engaged in the field of peaceful uses of atomic energy or in those engaged in providing national information services in this field. The first issue of INIS Atomindex represented, however, the first result of five years of effort on the part of the International Atomic Energy Agency (IAEA) and its member states to initiate a unique experiment: building the first international computerized documentation system based on decentralized input preparation. In particular, the input was designed to come from nations and organizations which, apart from speaking different languages, had reached very different levels of economic development, had a varying experience of using the techniques and equipment of information processing, and had staffs in their information services who had received very different background training⁽¹⁾.

2. PRESENT STATUS

So far, INIS has developed into a large integrated information system with a star-like structure shown in fig. 1. Forty-five countries and 12 international and intergovernmental organizations which are responsible for 90% of the world publications in nuclear science and technology are participating in INIS. The system collects, processes and publishes 5000-6000 items per month. These figures are already very near the project capacity which was estimated at approximately 80,000 documents per year⁽²⁾.

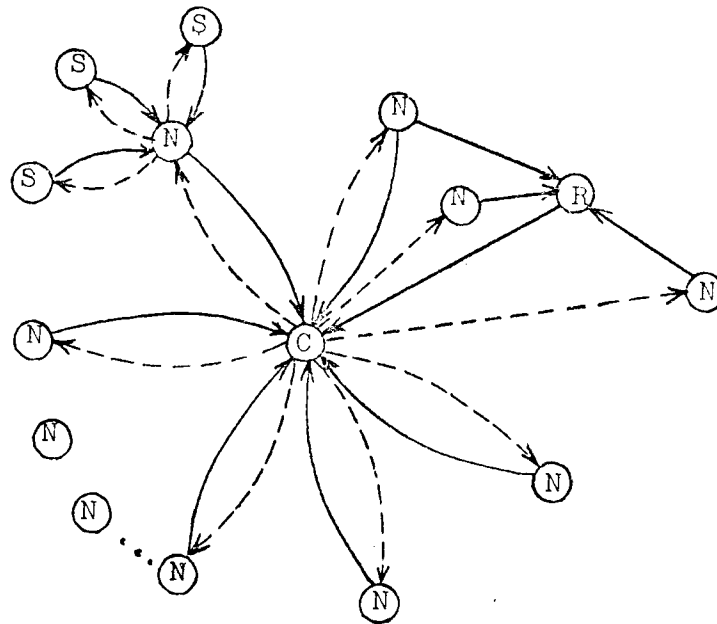


Fig. 1. Schematic structure of INIS interconnections

- C - INIS Centre at IAEA, Vienna
- N - National Centres
- S - Internal Subcentres reporting to a national one
- R - A Regional Centre
- - Input
- - Output products

The input into INIS is prepared according to rules and standards common to the whole system in reporting centres(3, 4) under the supervision of INIS Liaison Officers. These are appointed by their governments or by the managing bodies of their international organizations and are responsible for:

- scanning the new publications of both conventional and non-conventional literature* and identifying those which fall within

* Conventional literature is that obtainable through normal commercial channels. Such literature as is not available commercially, for example, technical reports, preprints, theses, etc., is termed non-conventional literature.

the INIS subject scope;

- processing the items collected and submitting the resulting input to the INIS Centre in Vienna;
- in many instances, utilizing the INIS output products.

The input received in Vienna is merged, checked for consistency and errors, corrected, if necessary, and sorted. Output products are distributed twice a month in the following forms:

- INIS Atomindex on magnetic tape

For countries with computer facilities able to process information recorded in machine-readable form, INIS supplies the INIS Atomindex on magnetic tape. These tapes contain detailed bibliographic records and subject descriptors for all items of literature reported to INIS over a period of half a month. These records permit the selection of items using one or more of a large number of data elements: subject, title, author, institution, country of origin, date or form of publication, etc. The carrier language of the computer records is English; however, titles are always also given in the original language, non-Roman alphabets being appropriately transliterated. The magnetic tape service is only available to governments and international organizations participating in INIS. They in turn make the copies required and distribute them as they deem fit. The records on each tape are recorded serially and are available both in a 7- or a 9-track format.

- INIS Atomindex in printed form

This printed form of the INIS Atomindex is issued by the Agency twice a month and offers an ordered record of all the items on the corresponding magnetic tape. A high degree of accuracy of publication is ensured by using a method of photo-composition which prints information directly from magnetic tape. Each member state of the IAEA receives one copy free of charge, while members of INIS receive two. The INIS Atomindex can also be purchased by any individual institute or library from one of the IAEA's sales agents or directly from the IAEA in Vienna. There is also a bulk subscription scheme and one whose price includes shipment by air-mail to all countries outside Europe. Payment may be made in the national currency if the Agency holds a local bank account. The items included in the INIS Atomindex are grouped by category. There is also an author index, a corporate author index, a report number index and subject index based on double-level flagging of subject descriptors. Cumulative indexes generated every six months are also available.

- Abstracts on microfiche

Every item published in the INIS Atomindex is identified by a serial Reference Number (RN). For every item there is an abstract available in at least one of the four official languages of the Agency, namely English, French, Russian or Spanish. For ease of distribution these abstracts are arranged by their RN on microfiches with a reduction of 20:1. In this way, up to 60 abstracts can be reproduced on a standard sheet of film (148 mm x 105 mm). A set of microfiches is produced to match each issue of the INIS Atomindex. These microfiche sets may also be obtained on subscription as an addition to the INIS Atomindex.

- Full texts of nonconventional literature on microfiche

Many of the items recorded in the INIS Atomindex are articles in scientific journals or books that are commercially available. Some items are nonconventional literature, which are not commercially available. About 30% of the items reported to INIS fall in the latter category. The Agency receives these items in full-size copy from the national centres and converts them into microfiches for ease of distribution. These microfiche copies can be obtained from the Agency, either individually or in sets, by the national Liaison Officers for distribution among their users, or by the users themselves.

3. TECHNICAL ASPECTS

INIS had been conceived as a mission-oriented system covering all the aspects of the peaceful uses of atomic energy^(5c). Therefore, its subject scope was designed to cover not only nuclear science and technology as such but also a number of related fields:

- physical science (general physics, high-energy physics, neutron and nuclear physics);
- chemistry, materials, and earth sciences;
- biology, agriculture, medicine, health and safety, environment;
- industrial application of radioisotopes and radiations;
- engineering, reactor technology and instrumentation, waste management;
- economic and legal aspects, handling of nuclear information, safeguards and inspection, nuclear computation and simulation, nuclear programs and management, etc.

To facilitate the system's start-up, its subject scope was artificially limited to 25% of full scope during the first two years of operation. Full-scope input was accepted on a voluntary basis in 1972 from those inputting centres which were ready to ensure it and became mandatory for all the INIS participants as from January 1973.

It is quite clear that to obtain the necessary speed in data handling on this scale, a computer-based system is necessary. However, a computer cannot handle unforeseen situations, and the greatest care must therefore be taken when inputting data.

The information services in the various countries participating in INIS are at different levels of technical expertise and many different languages are involved. It was therefore clear that a prerequisite to the proper functioning of the system would be a set of detailed instructions and rules for preparing the input (5a-o).

English was chosen as the carrier language for recording information. This had the particular advantage that many existing international standards and formats could be used and a number of information problems could be easily solved.

It must also be borne in mind that some of the INIS subsystems which are now linked in an integrated information system existed before INIS itself had been created. Thus, compatibility acquired primary importance both in adapting the existing national systems to the INIS requirements and in designing system elements for those countries where these had not been present. It is pertinent to list here some of the sources of standards used in planning INIS.

Bibliographic Descriptions and Data Recording

- The INIS format for bibliographic records on magnetic tape is based on the U.S. standard for magnetic tape bibliographic information interchange (ANSI Z39.2-1971).
- The bibliographic data elements were chosen by a group of experts convened by the IAEA, before recommendations were made by the Working Group on Bibliographic Descriptions of ICSU and UNESCO's "Joint Project on Communication of Scientific Information" (UNISIST).
- The INIS character set consists of 120 symbols which are used for the printing of the INIS Atomindex. The corresponding codes of these symbols on magnetic tape differ only slightly from the ISO 7-bit code of international interchange because INIS uses an 8-bit code. These deviations will be reconsidered when ISO decides to adopt the 8-bit code.
- The problem of transliteration of selected non-Roman characters was solved by the adoption of ISO Recommendation R9--1968 with some deviations in the transliteration of the Cyrillic alphabet and diacritical marks (IAEA-INIS-10 (Rev.1)).
- The format used for corporate entries was that recommended by the U.S. Committee on Scientific and Technical Information (COSATI) in its

"Standard for Descriptive Cataloguing of Government Scientific and Technical Reports (PB-17 33 14)." This list of codes is available on magnetic tape as well as in printed form. At the present time it contains about 14,300 items and is updated continuously. Printed revisions are issued yearly and are supplemented by monthly lists of additions and corrections. The format for records in the Journal Title Authority List is based on the standard abbreviations for journal titles by UNISIST/ICSU-AB in the "International List of Periodical Title Word Abbreviations."

- Codes for countries and international organizations correspond to the recommendations of the U.S. Government Federal Information Processing Standard (FIPS PUB 10). The names of the countries correspond to the list given in the UN Terminology Bulletin No. 263 (ST/CS/SER. F/263, 17 June 1970) and are updated as necessary. The two-letter codes used will be reconsidered as soon as an ISO standard is accepted.

Abstracts

Difficulties concerning the rules for the preparation of abstracts were solved by adopting certain of the basic recommendations of ISO and UNESCO, while also incorporating guidelines drawn from the U.S. Patent Office and a number of science information services. There is a clear need for practical instruction in the preparation of abstracts suitable for the different types of documents included in INIS input, and to this end a special manual^(5d) was prepared. This is a self-instruction manual, illustrating the differences between different types of abstracts, and the essentials to be included in an abstract. The particular form of abstract suitable for various kinds of publications and disciplines, and the appropriate information content, are discussed with reference to typical examples.

As mentioned above, the INIS abstracts are now being microfiched. Experiments with modern equipment for optical character recognition are in progress and it is hoped that in the near future the system will be able to process and record abstracts in machine readable form using all four official languages of IAEA.

Thesaurus

Here it might be worth recalling the UNESCO definition of a thesaurus as "a controlled and dynamic vocabulary of semantically and generically related terms which comprehensively covers a specific domain of knowledge." The INIS Thesaurus^(5m) contains not only terms from nuclear physics and reactor technology but also from such related fields as isotope technology, instruments, chemistry, life sciences and others. Its Revision 7 contains 13,115 descriptors and 3,805 forbidden terms, all listed alphabetically. Considering that both input preparation and the retrieval operation are highly decentralized, the responsibility for maintaining the INIS Thesaurus lies with the INIS Centre at the Agency. In order to achieve a high level of consistency in the

controlled vocabulary, the structure and presentation of the thesaurus must be understandable, predictable and unambiguous to the users of the system.

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Microfiche Service

To ensure compatibility with existing microfiche equipment, the INIS microfiches follow the standards for microfiche production, set out in UN document ST/PB/30. The possibilities of switching over to a greater reduction ratio (24:1) with 98 frames per fiche are being investigated.

Training

It is clear that the various degrees of expertise of the staff available in the nations contributing to INIS have made it essential to have a detailed and comprehensive training program. The staff have to become familiar with the formats, rules and standards that apply to input preparation, and they must also be instructed on how to make the best utilization of the INIS outputs.

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4. NON-SYSTEM ASPECTS

As a direct outcome of the 1955 Geneva Conference, the International Atomic Energy Agency was founded and one of its aims, as defined in its statute, was "to further the exchange of scientific and technical information on the peaceful uses of atomic energy." The fact that the leading abstracting journals of the world (Nuclear Science Abstracts, Bulletin Signalétique, Referativnyi Zhurnal, etc.) with their limited budgets were no longer able to deal with the flood of new literature on nuclear science and technology made it clear that the Agency would have to play a greater part in furthering information exchange. In 1965, the Director General of the IAEA invited a consultant from the USSR and one from the USA to outline an information handling scheme that would provide a comprehensive coverage of literature and would incorporate up-to-date processing techniques for storage and retrieval. Following the recommendations of these two consultants, 50 information specialists from internationally recognized institutions were invited to take part in a study on operating policy and system development that lasted more than four years.

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The second goal is best achieved by working with existing international standards and searching for international agreement in areas where none exist at present.

5. CONCLUSIONS

Summarized below are factors that led to the successful inception of INIS by the IAEA and its member states:

- Existence of an international organization (the IAEA) devoted to work in a specific subject field, and in which all member states have equal rights of access to all the organization's activities;
- Interest of the member states in information exchange as a means of furthering their national economic development;
- The ability of the organization's governing body to guarantee sufficient funds for establishing and operating on a long term basis any system of information exchange agreed upon;
- Recognition that the system must be oriented toward fulfilling the special needs of the developing countries (see Appendix);
- Agreement by member states to accept all expenses involved in preparing their national inputs, while recognizing that the total output is available to all users;
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With the creation of INIS, the IAEA and its member states have accepted a great measure of responsibility for fostering information exchange. The success of INIS in operating the first system with decentralized input preparation will serve to strengthen the belief of nations in the value of this form of international cooperation.

The IAEA hopes that INIS will prove a worthy forerunner of a future world-wide scientific information exchange system.

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 - l) IAEA-INIS-12, INIS: Manual for Indexing
 - m) IAEA-INIS-13, INIS: Thesaurus
 - n) IAEA-INIS-14, INIS: Description of Computer Programs
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DEVELOPING COUNTRIES' PARTICIPATION IN INIS

Of 45 INIS member states 22 are developing countries; 15 of them are regular suppliers of input (13 on worksheets and two in paper-tape form). Ten developing countries receive the INIS output tapes and perform (or are on the way to start) retrieval services based on them.

Country	INPUT PREPARATION		Standing orders	OUTPUT MAGNETIC TAPES' USAGE
	Form	Number of docs submitted and published in Jan.-Nov. 1973	Number of documents submitted in Jan.-Apr. 1974	Services offered and programs used
Argentina	WS	35	25	Yes SDI; IRMS
Bangladesh	WS	2		
Brazil	PT	165	46	Yes SDI; Special retrieval program
Bulgaria	WS	125	64	Yes No service; IRMS and STAIRS experiments
Chile	WS	3		
Czechoslovakia	WS	556	351	Yes SDI; Special retrieval program
Egypt	WS	35	9	
Hungary	WS	321	52	Yes No information available
India	PT	1001	195	Yes SDI; Retro; Special retrieval program
Israel	WS	78	90	Yes SDI; Special retrieval program
Korea (South)				
Mexico	WS	13	18	Yes
Pakistan	WS	5	3	
Peru				
Philippines	WS	46	2	
Poland	WS	224	79	
Romania	WS	204	46	Yes
Spain	WS	7	4	
Thailand				
Turkey	WS	8	15	
Vietnam (South)				
Yugoslavia	WS			Yes SDI; Special retrieval program

Abbreviations: WS - Worksheets

PT - Paper tape

Note: Countries are considered "developing" according to the List of the IAEA Division of External Relations/14 January 1974.

Meeting on the
FEASIBILITY OF AN INTERNATIONAL INFORMATION SYSTEM
FOR THE DEVELOPMENT SCIENCES (DEVSIS)

Co-sponsored by the
International Development Research Centre
the Organization for Economic Co-operation and Development
and Unesco (within the framework of its UNISIST program)
OTTAWA, 11-13 JUNE, 1974

DEVSIS (1974) W.P. 6

INIS: A FEASIBILITY EXAMPLE OF A MODERN INTERNATIONAL
INFORMATION SYSTEM WITH DECENTRALIZED INPUT PREPARATION

V. Gadjokov, Zh. Turkov

International Atomic Energy Agency

Vienna, Austria

1. INTRODUCTION

In May 1970 the first issue of INIS Atomindex came off the press. One month before that it was prepared in magnetic tape form and distributed among the INIS participants. This more-than-modest information bulletin contained a mere 147 bibliographic entries classified by subject category but not provided with subject descriptors. It hardly excited a ripple of interest either in scientists and engineers engaged in the field of peaceful uses of atomic energy or in those engaged in providing national information services in this field. The first issue of INIS Atomindex represented, however, the first result of five years of effort on the part of the International Atomic Energy Agency (IAEA) and its member states to initiate a unique experiment: building the first international computerized documentation system based on decentralized input preparation. In particular, the input was designed to come from nations and organizations which, apart from speaking different languages, had reached very different levels of economic development, had a varying experience of using the techniques and equipment of information processing, and had staffs in their information services who had received very different background training⁽¹⁾.

2. PRESENT STATUS

So far, INIS has developed into a large integrated information system with a star-like structure shown in fig. 1. Forty-five countries and 12 international and intergovernmental organizations which are responsible for 90% of the world publications in nuclear science and technology are participating in INIS. The system collects, processes and publishes 5000-6000 items per month. These figures are already very near the project capacity which was estimated at approximately 80,000 documents per year⁽²⁾.

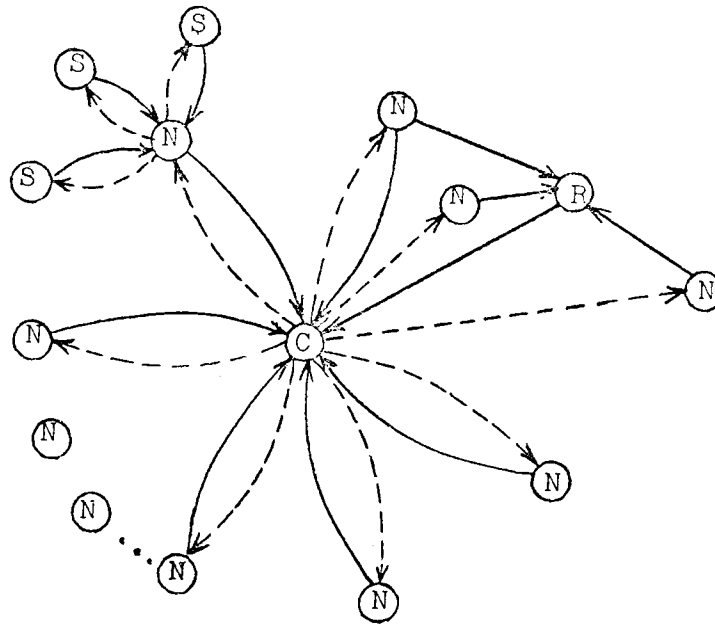


Fig. 1. Schematic structure of INIS interconnections

C - INIS Centre at IAEA, Vienna

N - National Centres

S - Internal Subcentres reporting to a national one

R - A Regional Centre

→ - Input

---→ - Output products

The input into INIS is prepared according to rules and standards common to the whole system in reporting centres^(3, 4) under the supervision of INIS Liaison Officers. These are appointed by their governments or by the managing bodies of their international organizations and are responsible for:

- scanning the new publications of both conventional and non-conventional literature* and identifying those which fall within

* Conventional literature is that obtainable through normal commercial channels. Such literature as is not available commercially, for example, technical reports, preprints, theses, etc., is termed non-conventional literature.

the INIS subject scope;

- processing the items collected and submitting the resulting input to the INIS Centre in Vienna;
- in many instances, utilizing the INIS output products.

The input received in Vienna is merged, checked for consistency and errors, corrected, if necessary, and sorted. Output products are distributed twice a month in the following forms:

- INIS Atomindex on magnetic tape

For countries with computer facilities able to process information recorded in machine-readable form, INIS supplies the INIS Atomindex on magnetic tape. These tapes contain detailed bibliographic records and subject descriptors for all items of literature reported to INIS over a period of half a month. These records permit the selection of items using one or more of a large number of data elements: subject, title, author, institution, country of origin, date or form of publication, etc. The carrier language of the computer records is English; however, titles are always also given in the original language, non-Roman alphabets being appropriately transliterated. The magnetic tape service is only available to governments and international organizations participating in INIS. They in turn make the copies required and distribute them as they deem fit. The records on each tape are recorded serially and are available both in a 7- or a 9-track format.

- INIS Atomindex in printed form

This printed form of the INIS Atomindex is issued by the Agency twice a month and offers an ordered record of all the items on the corresponding magnetic tape. A high degree of accuracy of publication is ensured by using a method of photo-composition which prints information directly from magnetic tape. Each member state of the IAEA receives one copy free of charge, while members of INIS receive two. The INIS Atomindex can also be purchased by any individual institute or library from one of the IAEA's sales agents or directly from the IAEA in Vienna. There is also a bulk subscription scheme and one whose price includes shipment by air-mail to all countries outside Europe. Payment may be made in the national currency if the Agency holds a local bank account. The items included in the INIS Atomindex are grouped by category. There is also an author index, a corporate author index, a report number index and subject index based on double-level flagging of subject descriptors. Cumulative indexes generated every six months are also available.

- Abstracts on microfiche

Every item published in the INIS Atomindex is identified by a serial Reference Number (RN). For every item there is an abstract available in at least one of the four official languages of the Agency, namely English, French, Russian or Spanish. For ease of distribution these abstracts are arranged by their RN on microfiches with a reduction of 20:1. In this way, up to 60 abstracts can be reproduced on a standard sheet of film (148 mm x 105 mm). A set of microfiches is produced to match each issue of the INIS Atomindex. These microfiche sets may also be obtained on subscription as an addition to the INIS Atomindex.

- Full texts of nonconventional literature on microfiche

Many of the items recorded in the INIS Atomindex are articles in scientific journals or books that are commercially available. Some items are nonconventional literature, which are not commercially available. About 30% of the items reported to INIS fall in the latter category. The Agency receives these items in full-size copy from the national centres and converts them into microfiches for ease of distribution. These microfiche copies can be obtained from the Agency, either individually or in sets, by the national Liaison Officers for distribution among their users, or by the users themselves.

3. TECHNICAL ASPECTS

INIS had been conceived as a mission-oriented system covering all the aspects of the peaceful uses of atomic energy^(5c). Therefore, its subject scope was designed to cover not only nuclear science and technology as such but also a number of related fields:

- physical science (general physics, high-energy physics, neutron and nuclear physics);
- chemistry, materials, and earth sciences;
- biology, agriculture, medicine, health and safety, environment;
- industrial application of radioisotopes and radiations;
- engineering, reactor technology and instrumentation, waste management;
- economic and legal aspects, handling of nuclear information, safeguards and inspection, nuclear computation and simulation, nuclear programs and management, etc.

To facilitate the system's start-up, its subject scope was artificially limited to 25% of full scope during the first two years of operation. Full-scope input was accepted on a voluntary basis in 1972 from those inputting centres which were ready to ensure it and became mandatory for all the INIS participants as from January 1973.

It is quite clear that to obtain the necessary speed in data handling on this scale, a computer-based system is necessary. However, a computer cannot handle unforeseen situations, and the greatest care must therefore be taken when inputting data.

The information services in the various countries participating in INIS are at different levels of technical expertise and many different languages are involved. It was therefore clear that a prerequisite to the proper functioning of the system would be a set of detailed instructions and rules for preparing the input (5a-o).

English was chosen as the carrier language for recording information. This had the particular advantage that many existing international standards and formats could be used and a number of information problems could be easily solved.

It must also be borne in mind that some of the INIS subsystems which are now linked in an integrated information system existed before INIS itself had been created. Thus, compatibility acquired primary importance both in adapting the existing national systems to the INIS requirements and in designing system elements for those countries where these had not been present. It is pertinent to list here some of the sources of standards used in planning INIS.

Bibliographic Descriptions and Data Recording

- The INIS format for bibliographic records on magnetic tape is based on the U.S. standard for magnetic tape bibliographic information interchange (ANSI Z39.2-1971).
- The bibliographic data elements were chosen by a group of experts convened by the IAEA, before recommendations were made by the Working Group on Bibliographic Descriptions of ICSU and UNESCO's "Joint Project on Communication of Scientific Information" (UNISIST).
- The INIS character set consists of 120 symbols which are used for the printing of the INIS Atomindex. The corresponding codes of these symbols on magnetic tape differ only slightly from the ISO 7-bit code of international interchange because INIS uses an 8-bit code. These deviations will be reconsidered when ISO decides to adopt the 8-bit code.
- The problem of transliteration of selected non-Roman characters was solved by the adoption of ISO Recommendation R9--1968 with some deviations in the transliteration of the Cyrillic alphabet and diacritical marks (IAEA-INIS-10 (Rev.1)).
- The format used for corporate entries was that recommended by the U.S. Committee on Scientific and Technical Information (COSATI) in its

"Standard for Descriptive Cataloguing of Government Scientific and Technical Reports (PB-17 33 14)." This list of codes is available on magnetic tape as well as in printed form. At the present time it contains about 14,300 items and is updated continuously. Printed revisions are issued yearly and are supplemented by monthly lists of additions and corrections. The format for records in the Journal Title Authority List is based on the standard abbreviations for journal titles by UNISIST/ICSU-AB in the "International List of Periodical Title Word Abbreviations."

- Codes for countries and international organizations correspond to the recommendations of the U.S. Government Federal Information Processing Standard (FIPS PUB 10). The names of the countries correspond to the list given in the UN Terminology Bulletin No. 263 (ST/CS/SER. F/263, 17 June 1970) and are updated as necessary. The two-letter codes used will be reconsidered as soon as an ISO standard is accepted.

Abstracts

Difficulties concerning the rules for the preparation of abstracts were solved by adopting certain of the basic recommendations of ISO and UNESCO, while also incorporating guidelines drawn from the U.S. Patent Office and a number of science information services. There is a clear need for practical instruction in the preparation of abstracts suitable for the different types of documents included in INIS input, and to this end a special manual^(5d) was prepared. This is a self-instruction manual, illustrating the differences between different types of abstracts, and the essentials to be included in an abstract. The particular form of abstract suitable for various kinds of publications and disciplines, and the appropriate information content, are discussed with reference to typical examples.

As mentioned above, the INIS abstracts are now being microfiched. Experiments with modern equipment for optical character recognition are in progress and it is hoped that in the near future the system will be able to process and record abstracts in machine readable form using all four official languages of IAEA.

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 - a) IAEA-INIS-1, INIS: Descriptive Cataloguing Rules
 - b) IAEA-INIS-2, INIS: Descriptive Cataloguing Samples
 - c) IAEA-INIS-3, INIS: Subject Categories and Scope Descriptions
 - d) IAEA-INIS-4, INIS: Instructions for Submitting Abstracts
 - e) IAEA-INIS-5, INIS: Terminology and Codes for Countries and International Organizations
 - f) IAEA-INIS-6, INIS: Authority List for Corporate Entries
 - g) IAEA-INIS-7, INIS: Magnetic and Punched Paper Tape Codes and Character Sets
 - h) IAEA-INIS-8, INIS: Paper Tape Specifications and Record Format
 - i) IAEA-INIS-9, INIS: Magnetic Tape Specifications and Record Format

- j) IAEA-INIS-10, INIS: Transliteration Rules for Selected Non-Roman Characters
 - k) IAEA-INIS-11, INIS: Authority List for Journal Titles
 - l) IAEA-INIS-12, INIS: Manual for Indexing
 - m) IAEA-INIS-13, INIS: Thesaurus
 - n) IAEA-INIS-14, INIS: Description of Computer Programs
 - o) IAEA-INIS-15, INIS: Self-Teaching Manual for Descriptive Cataloguers
6. European Atomic Energy Community, Brussels, Belgium, "EURATOM Thesaurus: Indexing Terms Used within EURATOM's Nuclear Documentation System".
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CEA-CEN-Saclay, Gif-sur-Yvette, Apr. 1973.

DEVELOPING COUNTRIES' PARTICIPATION IN INIS

Of 45 INIS member states 22 are developing countries; 15 of them are regular suppliers of input (13 on worksheets and two in paper-tape form). Ten developing countries receive the INIS output tapes and perform (or are on the way to start) retrieval services based on them.

Country	INPUT PREPARATION		Standing orders	OUTPUT MAGNETIC TAPES' USAGE Services offered and programs used
	Form	Number of docs submitted and published in Jan.-Nov. 1973	Number of documents submitted in Jan.-Apr. 1974	
Argentina	WS	35	25	Yes SDI; IRMS
Englandesh	WS	2		
Brazil	PT	165	46	Yes SDI; Special retrieval program
Bulgaria	WS	125	64	Yes No service; IRMS and STAIRS experiments
Chile	WS	3		
Czechoslovakia	WS	556	351	Yes SDI; Special retrieval program
Egypt	WS	35	9	
Hungary	WS	321	52	Yes No information available
India	PT	1001	195	Yes SDI; Retro; Special retrieval program
Israel	WS	78	90	Yes SDI; Special retrieval program
Korea (South)				
Mexico	WS	13	18	Yes
Pakistan	WS	5	3	
Peru				
Philippines	WS	46	2	
Poland	WS	224	79	
Romania	WS	204	46	Yes
Spain	WS	7	4	
Thailand				
Turkey				
Vietnam (South)				
Yugoslavia	WS	8	15	Yes SDI; Special retrieval program

Abbreviations: WS - Worksheets
PT - Paper tape

Note: Countries are considered "developing" according to the List of the IAEA Division of External Relations/14 January 1974.

Meeting on the
FEASIBILITY OF AN INTERNATIONAL INFORMATION SYSTEM
FOR THE DEVELOPMENT SCIENCES (DEVSIIS)

Co-sponsored by the
International Development Research Centre
the Organization for Economic Co-operation and Development
and Unesco (within the framework of its UNISIST program)

OTTAWA, 11-13 JUNE, 1974

DEVSIIS (1974) W.P.7

AGRIS: An evolving system for international cooperation in providing
information in the fields of food and agricultural science and technology

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AGRIS: An evolving system for international cooperation in providing information in the fields of food and agricultural science and technology

1. Introduction

My object in preparing this working paper is not merely to inform its readers about the AGRIS system nor to use this as an occasion for adventitious publicity. The aim is to draw conclusions and transfer experience, inasmuch as it is relevant and transferable, to the system concept - DEVSIS - we are here to consider. Therefore, I do not think it would be particularly useful to "compare and contrast" (as examination papers invite English students to do) the merits or otherwise of AGRIS with other systems - INIS for example. Only when there are apparently valid conclusions, of a general nature, to be drawn from such comparisons, I shall try to do so.

Nor do I wish to develop an historical analysis of the AGRIS scenario. The AGRIS system as a whole is in a state of flux: its objectives and procedures

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are neither completely finalized nor, I trust, fossilized. So, on the principle that "it's a poor sort of memory that only works backwards" it is perhaps equally important to speculate about the future as it is to brood over the past.

I ought to make it quite clear that any comments or interpretations made in this paper are entirely personal ones: they do not represent the views of FAO (which I currently serve in the status of a consultant) nor do they represent the opinions of any other organization or individual connected with the AGRIS system. If, in this presentation I concentrate on the difficulties (or, if you prefer a more positive approach, the challenges) that we have faced or may have to face, rather than on the not inconsiderable successes that have been and will be achieved, I do so in order to try to make a genuine contribution to this meeting. The creation of an international, cooperative system is fraught with many problems, some of which can be anticipated because they are of a general nature. Additionally, DEVSIS will have constraints that are sui generis, some foreseeable, others not.

An honest personal appraisal of the AGRIS developments, exposing some of the difficulties encountered, should be constructive. I trust that the recipients of this paper will regard it as one prepared for limited circulation, for a particular group which has gathered to consider the creation of a new international system - a formidable task, but one which I intuitively support and believe to be worthy of serious and responsible consideration - and that what I say about AGRIS will not be regarded as a definitive analysis, nor will parts of this paper be subsequently quoted out of its context.

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2. The Background to AGRIS

John Woolston has given an excellent summary in his paper⁽¹⁾ of the background to both the INIS and AGRIS systems and pointed to the major similarities (technical) and dissimilarities (formulae for participation) of the two.

A. System Objectives:

It seems to be stating the obvious to say that any system must have clearly stated objectives before it can be developed on rational grounds. AGRIS Level One - Current Awareness Service, which is my main preoccupation here (Level Two is in a much more formative stage) - has indeed clearly defined objectives on paper. Moreover, they are agreed objectives, viz. "a comprehensive documentation service providing current awareness in all fields of FAO's responsibility". However, objectives defined as broadly as this are open to differences of emphasis and interpretation which just appear above the soil at the design phase and burst into blossom at the implementation stage.

There are at least two elements which lead to these differences in emphasis - (a) the "style" of approach, which depends on differing personal and social attitudes, and (b) the "target" user group envisaged. The two are inter-related.

- (a) Style of approach: One school of thought in our advisory bodies has favoured what has been termed a "quick and dirty" current awareness service. Basically, this implies optimizing the speed of delivery of the product (references to current literature) if necessary at the expense of bibliographic "purity" and, possibly, comprehensiveness. (For what it is worth, I tend to subscribe to this approach.)
- The other school lays more emphasis on comprehensiveness and, additionally, a once-and-for-all effort to get an accurate description of a document, so as to avoid unnecessary duplication of effort round

the world in various information services handling the same material.

Both approaches have their merits and are not necessarily mutually incompatible. It is my view, however, substantiated by some experience, that to optimize one approach tends to sub-optimize another. Moreover, it seems a fact of life that, even if there were complete unanimity of approach on the part of the senior decision-makers, local customs at the working level die hard: a comprehensive, punctilious bibliographer cannot at the (to him, apparent) whim of his director or government change overnight to a "quick and dirty" inputter.

- (b) Target user groups: Here there has been no tangible divergence of approach, rather a broadening. The initial immediate target user group is that concerned with agricultural research and development at the working level (although it must be realized that in the broad spectrum from developed to developing countries this is an extremely heterogeneous audience). However, those who wish to build-in comprehensiveness and high quality bibliographic description as system objectives have also in mind the needs of "secondary services": those information services (including AGRIS Level Two) which may use AGRIS One as a coarse screen through which to obtain (and avoid replicating) document references for particular local needs or for a specific sub-field within the broad scope of the system.

Perhaps there is no serious disparity of objectives here, although it must be admitted that it is hardly possible to satisfy all of the potential users all of the time. (Moreover, international systems

do not, as a rule, benefit from the user feedback which is more readily available from a local or specialist clientele). Again, however, we must face the inevitable constraint of sub-optimization, in one direction or another.

B. Scope and coverage:

The scope of the AGRIS system has never, in principle, been in dispute: it is already defined as "all fields of FAO's responsibility". However, the fields of FAO's responsibility are broad indeed, and the emphasis shifts (as it should) with the changing state of food and agriculture in the world.

Where the problems arise in a system of decentralized input centres (national or multinational) is that the scope of an individual centre's system approach is often not so broad. Thus, some centres would have to increase their local efforts (at a cost) to meet wider scope objectives. At least two questions arise here, the first obvious - who will pay? The second is more subtle and delicate. An established service already has a pre-conceived notion (based on experience, and user feedback) of what is valid, and is not easily persuaded that its own criteria may not be globally sufficient. Such a service may lie anywhere between two extremes: a broad scope with a wide coverage of any document which is likely to be useful to someone, somewhere, and a narrower scope concomitant with thoughtful selection and analysis.

It seems to me that this may be what a philosopher would call an "imponderable" of information science. Certainly there is validity in both viewpoints and I imagine that no existing system (INIS included) has solved this problem.

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C. Compatibility in input techniques:

For a collaborative international system, no other course is open than to agree to use existing international standards. UNISIST has taken upon itself the burden of clearing a path through this jungle, and its efforts in this direction are to be applauded. However, UNISIST can only propose: God, governments and independent services dispose. Only they can bridge the gap between the desire and the fulfilment. It is not feasible in this paper to go into the details of the niceties of inter-systems compatibility: suffice it to say they are formidable. AGRIS has, like INIS, made every effort to steer a course in the direction of using existing or evolving international standards. Many of our cooperating input centres face very real problems in adhering to these standards. The reasons are complex, but one is very easily understood: an established system has an investment in its own procedures. Where these deviate from international standards (which are not always unequivocal) there is a re-investment cost in getting in line with them. Further, there is the psychological barrier: why can't the rest of the world do as we do? - after all we do it well and have done so for years.

This being stated, it should be pointed out that the least of our problems in developing the AGRIS system has been to take over - and slightly modify to our peculiar needs - the procedures and computer programmes developed by the INIS system. Problems there are indeed, and there will be unforeseen ones, but AGRIS should clearly demonstrate that it is feasible for the world's oldest technological mission to use the facilities developed for the world's newest.

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D. Formula for participation:

Here the AGRIS/INIS systems do deviate in their approach. From its inception INIS has adopted the simple and manageable formula of putting the responsibility for submitting input and exploiting output at a national level through Member Governments. A little thought about the nature of the organization of nuclear science developments, and the greater proportion of literature coming from a few, highly developed countries will reveal the logic of this approach.

The situation in food and agriculture science and technology is much more complex from many points of view. The literature is also more diffuse. A fundamental choice was whether to take the (INIS) "national" approach or also to take account of existing and developing multinational or regional organizations. The advisory bodies favoured the latter approach which is obviously more complex and changeable. My own native country (Great Britain) is perhaps an instructive example. It is a sovereign state in its own right; it is a member of the Commonwealth of Nations; it is a member of the European Communities; it is the cradle of the English language - the most widely used communication language in science and technology. In principle, it could therefore approach its input "philosophy" from at least one of four viewpoints, or perhaps a combination of some or all of them.

Where there seems to be logic and merit in encouraging multinational or regional input (e.g. Latin America) this is the mode which has been pursued. However, organizations like FAO, which has a coordinating and sponsoring role in the AGRIS developments, are ultimately answerable to and controlled by Member Governments. It is not the prime objective of national delegates to represent multinational organizations, nor are the channels of communication necessarily common. But good communication at all levels - from general policy to technical intricacies - is imperative in a collaborative system.

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In my view, the main inadequacies of communication have not been at the technical level: perhaps we have been fortunate - our cooperating "specialists" have been extremely competent people, largely overcoming linguistic difficulties and differing cultural attitudes. Where problems have occurred is in the communication hierarchy: technologists - senior management - national "policy-makers". The latter group have apparently not always been adequately informed, resulting in a re-cycling of "problems" that had already been vigorously discussed and largely solved at the technical level.

E. Subject description:

Indexing and classification are notorious intellectual battlegrounds whenever subject specialists meet, and there has been no shortage of conflict in the AGRIS developments. The solutions which have been tentatively reached are, at most, interim agreements. The details are peculiar to the situation and warrant little further examination here. However, they do interrelate with the systems objectives (2.A.) and would do so, presumably, in the DEVSIS system.

F. "Carrier language":

English has been designated as the "carrier language" of the AGRIS Level One system and there has been surprisingly little conflict on this matter, so far.

G. Finance:

Like all cooperative systems, AGRIS faces problems of finance which, again, are probably peculiar to the system and the international and national

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infrastructures of its component bodies. Adequate financial provision is clearly essential. INIS was created within the programme of work and budget of the IAEA; AGRIS has, for reasons which are not particularly relevant here, developed so far with a considerable amount of external assistance. While this has been in many ways a stimulus to justification of each phase of development, it is my view that this factor has nevertheless retarded the implementation of the system and involved its senior staff in a great deal of diversionary effort.

3. Some speculations on the future of AGRIS

To speculate about the future of international information services seems to me a wholly justifiable activity. The development of such systems is a medium-term investment exercise: the immediate benefits tend to be small and it seems, on average, to take about five years at least to reach anything like full scale operation.

During the last few years we have witnessed quite profound changes in attitudes to information services - the terminology of industry and the market place has intruded. We are obliged to be (or at least to appear to be) "cost effective"; information is regarded as a saleable "commodity" or a "national resource" and we are exhorted to "package" our commodities or "husband" our resources. The analogy should not be pushed too far, neither should it be neglected, especially as we are considering the free (in at least two senses of that word) interchange of information at an international level. Governments are increasingly aware that the output of research is knowledge and that transmitted knowledge is information. This costs a great deal of capital and work to produce and disseminate.

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To forecast the future of the AGRIS system, it would be necessary to elaborate on "Level Two" ("a network of specialized services which may include specialized information centres, analysis centres and data banks, with responsibility in depth for particular subject fields") and its interrelation with Level One. However, I should like to make a brief observation on Level One in isolation. Schon⁽²⁾ has defined a centre-periphery model^(Fig.1) (and has exemplified the "agricultural extension" services as a "prototype" of this model) which rests on three basic elements:

- The information^{*} to be diffused exists, fully realized in its essentials, prior to diffusion
- Diffusion is the movement of information from a centre out to its ultimate users
- Directed diffusion is a centrally managed process of dissemination, training, and provision of resources and incentives.

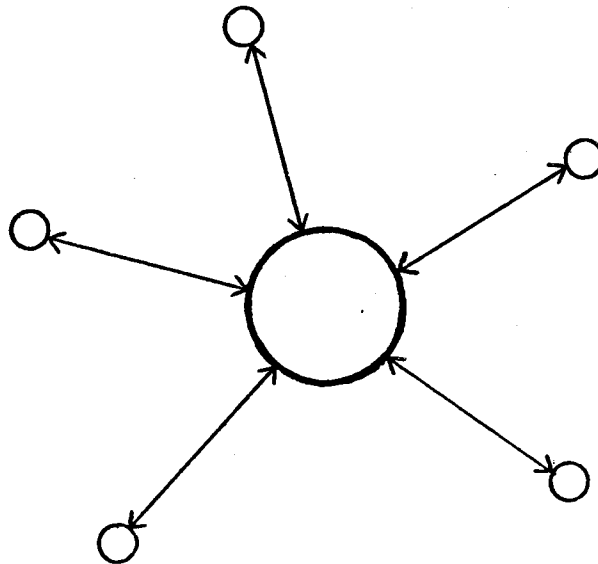


Fig.1. Centre-periphery model

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* Schon is concerned with innovation, but in my view the analogy is valid.

Schon argues, convincingly, that the existence of a centre-periphery system depends on

- the level of resources and energy at the centre, and the number of points at the periphery
- the infrastructure technology
- the capacity for generating and managing feedback.

A second model - the proliferation of centres^(Fig.2) is an elaboration of the first, designed as though to extend the limits and overcome the failure inherent in the simpler model.

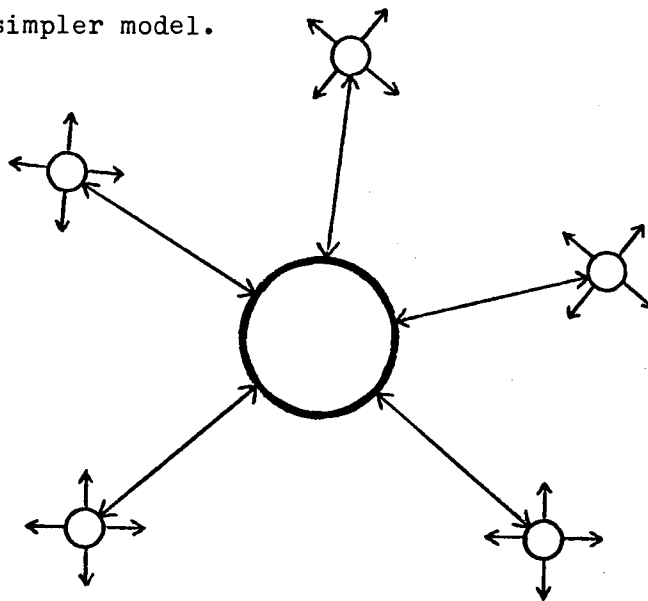


Fig.2. Proliferation of centres

This system retains the basic centre-periphery structure, but differentiates primary from secondary centres. Secondary centres engage in the diffusion of information: primary centres support and manage secondary centres. The effect is to multiply many-fold the reach and efficiency of the diffusion system.

I believe that this second model, not so formally stated, was what was in the minds of the AGRIS Study Group which recommended "a centralized structure, with some aspects of decentralization, particularly for input and output functions"⁽³⁾.

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Schon develops his thesis further - to the point where secondary centres "get out of control". "In failure, the model of the proliferation of centres may become a learning system in spite of itself. But it is a learning system in which the feedback loop is not from secondary to primary centres, but from secondary centres to themselves."

If, in the context of the development of the AGRIS system, over what in my view would be many years, the creation of "regional centres" learning from each other and communicating directly is a feasible structure, then it is a possibility which we should neither ignore, nor attempt to discourage.

I do not know whether these speculations have any relevance to DEVSIS as it is to be conceived, but to my mind they do represent a rather exciting and beneficial direction in which the AGRIS system could well develop.

4. The implications for DEVSIS

I shall assume that item (a) in "Purposes of the Meeting" (DEVSIS WP1) will receive an affirmative response and concentrate on items (b) and (c) inasmuch as I feel able to do so in advance of the discussion of these matters, and in the light of the experience gained through the development of the AGRIS system, as outlined above.

(b) (i) Subject scope:

I consider that the subject scope of the DEVSIS system is the most important factor in exemplifying the objectives of the system, or rather the policies that result from the formulation of these objectives. Without objectives, a system, in the sense that word has been used in this paper, is no system. In principle, the fundamental objectives of a system rarely change, though the policies laid down to achieve them

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should be sensitive to changing circumstances. The scope is a matter of policy. To set out with explicit or implied divergencies in policy is to avoid a decision that will have to be made sooner rather than later. It would be injudicious to confuse "flexibility" of approach with covert deviations of approach in the hope that one way or another, and in due time, a consensus view will emerge.

(ii) Overall concept of organization and operation:

Here one must be wary of false analogies. The INIS, AGRIS systems have a similar, but by no means identical (and in either case, both are evolving) pattern of centralization/decentralization with the component decentralized bodies being national or multinational organizations. The different kinds of organizations mentioned in Woolston's paper⁽¹⁾ are quite a "mixed bag" and indeed in one respect DEVSIS might be considered to be an international system of international systems. This - to borrow one of John Woolston's phrases - is an entirely new "ball game", and one perhaps should reserve one's judgement until the potential collaborators are identified, and the structure of their organizations and nature of their contributions are clarified, before approaching this concept. That is, in the classical systems analysis approach, we might examine the desirable outputs and the feasible inputs before considering the centralization or otherwise of some or all of the processing operations. From this should also emerge the function of any requisite coordinating bodies.

(c) Management and financing:

If, under item (d), there is to be a recommendation for a feasibility/ systems design study, then the terms of reference should include a clear indication of (at least) the most probable acceptable mechanisms of

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management and financing. The AGRIS Study Team had a subgroup to provide recommendations on these matters and it was an unenviable and (no disrespect is meant to those who worked hard on these problems) a somewhat unproductive exercise. The subgroup virtually worked in a vacuum. No advance commitments or pledges had been made, and the meetings were characterized by false analogies and speculation.

This is a rather intractable problem - no organization will write a blank cheque - but at the very least some of the more obvious constraints should be spelled out and - again to borrow a phrase from John Woolston - "ball park figures" provided.

- (d) Recommendations for further action are wholly dependent on the decisions made under (a), (b) and (c).

June 1974

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Meeting on the
FEASIBILITY OF AN INTERNATIONAL INFORMATION SYSTEM
FOR THE DEVELOPMENT SCIENCES (DEV SIS)

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DEV SIS (1974) W.P. 8

SUMMARY REPORT PRESENTED TO THE FINAL SESSION
OF THE MEETING

Opening Session

Dr. Hopper, Dr. Wysocki and Mr. Fossi, on behalf of the co-sponsoring organizations, emphasized the important role of information in development and the need to keep the objectives of sharing information in mind. Dr. Sylvestre indicated how Canada's experience in optimising information resources in a book-poor, bilingual, federal state might be an example to those involved in international co-operation.

General Session

Previous Initiatives Towards a Development Information System

Mr. Fossi described OECD's early pragmatic attempt to provide developing countries with appropriate and timely information. The development enquiry service, begun in 1963, relied on a voluntary network of correspondent institutions in developed countries, but there had been no common language for communication in the social sciences and economics.

Mr. Viet described the first attempt to fill this need with the preparation of the Aligned Descriptor List of economic and social terms, produced in 1969. This had brought together the interests of ILO, OECD, FAO, DSE and ICSSD. It had serious subject gaps, however, and did not involve other organizations such as UNIDO and UNDP with their own vocabulary problems. A broader list of descriptors was therefore prepared, and had become the Macrothesaurus, published in English, French, German and Spanish, and soon in Arabic and Portuguese.

Mr. Thompson described attempts at networking to share the resources of development organizations and achieve better cost/benefit ratios. The Jackson report had stressed the need for an information system and an infrastructure to enable the UN to produce effective development projects. Most UN agencies were now indexing their own documents, but

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standards and other tools were needed. ^{Several} ~~Most~~ agencies were also using computers and the indexing techniques of ILO's ISIS system. ^{not IBRD}

Agreements to adopt ISIS in ILO member countries always provided for needs expressed by the member country, so that the whole system was being improved.

Dr. Wysocki described three Unesco initiatives: the Science and Technology Policies Information Exchange System (SPINES), the Unesco Computerized Data Retrieval System for Documents in Social and Human Sciences (DARE) and the Unesco Computerized Documentation Service.

Status of UNISIST and Existing Systems

UNISIST

Dr. Wysocki presented working paper no. 4 describing UNISIST. It was a program not a system and was not in conflict with proposals for international systems. It was already trying to remedy many of the problems discussed by the meeting, for example in assistance to member states in strengthening their information infrastructures. National focal points were identified by the national governments and preferably should be in an agency connected with policy. Although UNISIST had begun with science and technology, extension to social sciences was being actively considered. A preliminary meeting had shown that this was feasible though social sciences information had problems not encountered with the natural sciences.

INIS

Dr. Gadjokov, in working paper no. 6, outlined the accomplishments of INIS after five years of preparation and five years of operation. Like UNISIST, INIS was already tackling some of the problems posed by the DEVSIS proposal. The incorporation of a subject index in INIS-Atomindex had made it much more useful to developing countries. The paper's

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conclusions, summarizing the factors that contributed to INIS's successful inception, showed what might be expected of other co-operative systems.

AGRIS

Mr. East spoke to working paper no. 7, which pinpointed aspects of AGRIS experience that were relevant to the DEVSIS proposal. Service to users should be emphasized and objectives clearly spelled out. AGRIS experience, following that of INIS, suggested that the time scale of the DEVSIS proposal was rather optimistic.

Introduction of DEVSIS Proposal (IDRC-doc-041)

Mr. Woolston's paper had been widely circulated and had generated many comments. In the natural sciences, information was concentrated in a few well-established services, in which the user could have complete confidence. In the applied sciences, most literature was under bibliographic control but the user lacked one comprehensive service. In economic and social development, much literature was not properly published, nor under bibliographic control. The user therefore could not know with confidence what had been done before and consequently there was much waste in what was perhaps man's most important activity. Were our priorities right? There was much duplication in the handling of social and economic literature, which would be eliminated by pooling existing resources. A world system could not be expected to grow naturally from a small beginning, however, and would need an international stimulus to reach developing countries at reasonable cost to them. Any initial system would be judged on the usefulness of the information it provided and on how rapidly it approached comprehensiveness. Mr. Woolston asked the meeting to decide whether such a system was needed, and if so to plan what needed to be done in the next year or two to define the system with sufficient precision so that commitments to it could then be forthcoming.

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Discussion of a Possible System

Mr. Woolston presented working paper no. 3, which had been written in an attempt to identify questions for consideration by the meeting.

Points of major importance arose during the presentation of all the working papers, in questions afterwards, and under agenda items 2c, 2d and 4. The discussions are summarized under the headings below, together with an indication of differences of opinion and matters for further consideration.

The Need for a Development Sciences Information System

Lack of critical information is a major constraint upon development planning. There are many examples of duplication and waste in development efforts due to poor access to existing knowledge. Duplication has also occurred in various information activities which have tried to remedy the situation and in doing so have revealed the need for co-

ordination. (It was generally agreed that better mobilization of information is ^{people & resources are} the key to development. Positive statements of support ^{the key} for this aspect of the DEVSIS proposal were made by UN, ECAFE, ECLA, UNDP, IBRD, CRNS, ICSSD, DSE and OECD, in addition to the initial statements of the co-sponsors of the meeting.

When details of the proposed DEVSIS were considered, however, it was evident that various fundamental questions first had to be answered before any approval was likely to be obtained. Discussion expanded the idea of a system to that of a service or program.

Relevance of the Proposal to the Development Process

How relevant the proposal is to users' needs was the most important factor in gaining acceptance. Though users in developed countries had development information problems of their own, relevance to developing

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country needs was given paramount importance. A system could be set up that would well serve developed country interests but would be unacceptable if it went no further. Poor access to suitable systems and services, whether national or international, could be considered a characteristic of under-development.

The developing country representatives felt strongly, however, that a system designed by developed country organizations on the grounds that access to information was good in itself would have little chance of success. Developed country governments might express interest but would not actively participate in an international effort unless its immediate usefulness to their needs could be convincingly demonstrated. Although the DEVSIS proposal was in response to needs expressed formally and informally on many occasions, this was insufficient motivation for participation.

Other participants pointed out how developing countries could benefit from an international system, which would help to define what needed to be done at the national level with national literature collected primarily for national use. It would involve strong national units assisted but not controlled by an international body, and developing countries would be involved in its design and possibly in any central processing. DEVSIS was an attempt to mobilize resources to meet national needs first of all, but nations could then tap a much larger body of potentially useful information.

Nevertheless, it became evident that the disparate needs of developing countries, and also of developed countries, had to be identified much more clearly before an international effort could be launched.

Evaluation of Present Activities

Little was known about the actual use made of existing systems, of the references they provided, and of the documents they flagged. Much more had to be known about their contribution, if any, to development decisions. No world systems existed in the field of economic and social development, however. The use of INIS outputs had not been systematically studied, and AGRIS was not yet in regular operation, although the user

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response to the experimental issue of Agrindex had been overwhelmingly positive. Comparisons with these two systems might not be valid for DEVSIS, however, and there were dangers in relying too heavily on previous successes under different conditions.

Nevertheless many lessons could be learned from previous activities, particularly those that failed, generally for reasons other than technical. It was suggested that any new system must be based upon existing facilities and must first help remedy their problems. Perhaps better co-ordination and integration would meet many requirements without the need for a completely new system. A comprehensive survey of all relevant activities and resources, including those in national institutions, and investigations into their effectiveness in solving users' problems were suggested as pre-requisites to any new international initiative.

In this regard there was some difference of opinion as to whether cost effectiveness could be measured, particularly of a system that might take several years to mature. A cost/benefit calculation, in the accounting sense, might be demanded by the present tightness of budgets, but quantification of some aspects would be impossible. Some inputting costs could be estimated fairly easily (INIS and AGRIS central processing costs are of the order of \$500 000 per annum), but decentralized operating costs would be much more difficult to establish. Against these, an appreciation of effectiveness would be necessary to attract funding. This could only be achieved by much better feedback from users.

Target Groups and the Involvement of Governments

Though any international effort should probably involve inter-governmental organizations, non-governmental organizations, the academic community, and private corporations, the co-operation of national governments, developing and developed, was essential. They voted the budgets of international organizations and controlled the national bodies participating.

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They would also want to decide whether to participate directly or through a regional arrangement. The problems of international co-operation in information activities were not technical but organizational, political and financial, and it was national governments that had to be convinced of the need. Most governments had yet to give a high enough priority to this type of work, and their staff tended to be discipline or sector-oriented.

The individuals who would have to do the convincing would generally be members of national planning bodies, who would act as gatekeepers to the information store. In the development of an international service, these individuals should therefore be part of the target audience which should be clearly defined.

Strengthening of National Information Infrastructures

There was complete agreement that assistance to nations taking part in any international program should receive great emphasis. Though information infrastructures in some developing countries were quite sophisticated, others needed considerable strengthening. Without that, the best intentions would fail. The capacity of developing countries to participate in international systems and to use them was a major limitation upon co-operative efforts. Training activities and the establishment of multipurpose national documentation centres should begin now. They would not conflict with plans for international co-operation but rather would be complementary as any international system had a lead-time of at least five years.

An International Host

It was generally accepted that any international system or service for development information should eventually be adopted by a member of the UN family. INIS particularly had demonstrated the stimulus of such an endorsement. It was impossible at this stage, however, to be more

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specific, and, though the methodology of the host institution might be important in defining technical details, it was unrealistic to expect any institution to consider adoption before much more detailed information was available on such matters as costs and necessary development work.

There was no question, however, that an international operation would have to be placed within the framework of UNISIST to provide the necessary links with other activities.

Project Demonstration

No commitments to a DEVSIS type of proposal could be expected until it was much more clearly defined. Several participants favoured a step-wise approach starting on a pilot scale to demonstrate the feasibility and utility of the proposal. Sufficient checkpoints and evaluations must be built in to enable an appreciation of effectiveness to be given to the priority setters. Interested organizations would be more likely to support this phased development, which would acquire in a rational manner the necessary experience for future extension. This idea was generally accepted. The scale of the pilot operation could be limited in several ways, by subject, by type of material, or by region.

Subject Scope

For the purpose of limiting the scale of the pilot project, it was suggested that the subject scope be limited to a few or even only one subject in an area of high priority, such as public financing or project evaluation. The consensus was against this, however, even though it would lead to a manageable exercise. INIS experience with a limited subject scope had shown that greater selectivity was needed at input and that the usefulness of the system was not indicated until full scope was achieved. Economic problems were generally interrelated and any subject

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limitation would be prejudging developing countries' needs at any one time. A broad scope was needed to give a proper appreciation of inputting difficulties, needs and, most important, the potential of the resulting service.

A pragmatic approach using the Macrothesaurus as the basis for a subject scope definition and incorporating the actual demand for information was suggested and generally accepted. This would probably coincide with the topics outlined in working paper no. 3, the precise definition of which required further elaboration. To these might be added planning studies, the methodology of planning, and sectoral development policy.

A complete and precise definition of subject scope was too long a task for the meeting but there was some discussion of principles involved. Some participants wanted to broaden it beyond economic and social matters to include political, technological and administrative questions. Others were worried about the exclusion of certain sectoral information as some documents would inevitably fall within the scope of more than one system. Some overlap would be necessary. This problem would be alleviated, however, by ensuring that all these systems were in the framework of UNISIST, one of whose main aims was to establish links between systems in different subject areas and with different missions. Systems interconnection should receive first priority in considerations of subject scope.

Coverage

Material needed for development included rosters, project information, data and documents. The DEVSIS proposal had been limited to documents, as a system based upon them would be manageable. Data, particularly raw data, were much more difficult to process, especially for comparative purposes. Several participants felt that information on institutions and people was as important as documents.

If coverage was to be limited in the pilot operation, emphasis could be given to mimeographed reports and documents not published in the

conventional sense. These might be more important than published material. They were particularly difficult to locate at present, and some participants felt that this type of material would remain extremely difficult to collect even with a co-operative system. The problem of confidentiality was not discussed.

Technical Problems

Technical problems would probably be like those of INIS and AGRIS and there was no doubt at the meeting that they could be solved. Agenda items 4b and c were not discussed. Computer systems would probably be needed and if located at a central unit would be useful for training purposes. Individual inputting centres need not use them, however, and there were pleas not to introduce capital-intensive high technology too early.

Procedure Following the Meeting

(N.B. This section is likely to be modified at the final session)

It was assumed during the meeting that some sort of task force would be set up to carry the proposal to the next stage. Many participants emphasized that it would need very explicit guidelines. Its immediate function changed as a result of the discussion, however, from systems design to definition of alternative proposals backed by adequate information. It would therefore involve a variety of people in addition to technicians. Suggestions for a steering committee as well as, or possibly incorporating, a technical task force were discussed. Developing countries should be deeply involved, but it would be difficult to convene their participants for the several months needed. The idea was adopted of a steering committee supported by a secretariat from some suitable body and with resources to use consultants, convene groups, travel, and interact with eventual operators and users of the system.

IDRC had indicated its willingness to support any interim period or preparatory work, particularly as most funding agencies were limited by long-term budget planning. There was a definite request for IDRC to

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take a key role, not only by providing funds, but also by recruiting a permanent secretariat. IDRC's initial reaction to this was that it could put such a proposal to its governing body only if it could be seen as a definite step towards an ultimate system or service involving UN agencies in the planning and in the final operation.

Meeting on the
FEASIBILITY OF AN INTERNATIONAL INFORMATION SYSTEM
FOR THE DEVELOPMENT SCIENCES (DEVSIS)

Co-sponsored by the
International Development Research Centre
the Organization for Economic Co-operation and Development
and Unesco (within the framework of its UNISIST program)
OTTAWA, 11-13 JUNE, 1974

DEVSIS (1974) W.P. 8 (Rev. 1)

SUMMARY RECORD OF THE MEETING

based on the version presented to the final session

M. Brandreth
Information Sciences Division
International Development Research Centre
Ottawa, Canada

OPENING SESSION

Dr. Hopper, Dr. Wysocki and Mr. Fossi, on behalf of the co-sponsoring organizations, emphasized the important role of information in development and the need to keep the objectives of sharing information in mind. Dr. Sylvestre indicated how Canada's experience in optimising information resources in a bilingual, federal state covering a large geographical area might be an example to those involved in international co-operation.

GENERAL SESSION

PREVIOUS INITIATIVES TOWARDS A DEVELOPMENT INFORMATION SYSTEM

Mr. Fossi described the early pragmatic attempt of the OECD Development Centre to provide developing countries with appropriate and timely information. The Development Enquiry Service, begun in 1965, relied on a voluntary network of correspondent institutions in developed and developing countries, but there had been no common language for communication in the social sciences and economics.

The first attempt to fill this gap, described by Mr. Viet, had been the Aligned Descriptor List of economic and social terms, produced in 1969. This had brought together the interests of ILO, OECD, FAO, DSE and ICSSD. It had serious subject gaps, however, and did not involve other organizations, such as UNIDO and UNDP, with their own vocabulary problems. A broader list of descriptors was therefore prepared, which had become the Macrothesaurus, published already in English, French, German and Spanish, and soon in Arabic and Portuguese.

Mr. Thompson described attempts at networking to share the resources of development organizations and achieve better cost/benefit ratios. The Jackson report⁽¹⁾ had stressed the need for an information

(1). R.G.A. Jackson, A Study of the Capacity of the United Nations Development System, document DP/5, Geneva, 1969.

system and an infrastructure to facilitate the definition of effective development projects and their management. Most UN agencies were now indexing their own documents, but standards and other tools were needed. Several agencies were also using computers and the indexing techniques of ILO's ISIS system. Any agreement to adopt ISIS in an ILO member country always provided for development work to meet needs expressed by the country, and in this way the whole system was being improved.

Dr. Wysocki described three Unesco initiatives: the Science and Technology Policies Information Exchange System (SPINES), the Unesco Computerized Data Retrieval System in Social and Human Sciences (DARE) and the Unesco Computerized Documentation Service.

STATUS OF UNISIST AND EXISTING SYSTEMS

UNISIST

Dr. Wysocki presented working paper no 4⁽¹⁾ describing UNISIST, which was a program not a system, and did not conflict with proposals for international systems. It was already trying to remedy many of the problems discussed later by the meeting, for example, by assistance to member states in strengthening their information infrastructures. National focal points were identified by the national governments and preferably should be in an agency connected with policy. Although UNISIST had begun with science and technology, an extension into the social sciences was being actively considered. A preliminary meeting had shown this to be feasible, though social sciences information had different problems from the natural sciences.

INIS

Dr. Gadjokov, in working paper no. 6⁽²⁾, outlined the accomplishments of INIS after five years of preparation and five years of operation. Like UNISIST, INIS was already tackling some

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- (1). A. Wysocki, UNISIST Programme, Its Role in International Co-operation in Scientific and Technical Information, DEVSIS (1974) W.P.4
 - (2). V. Gadjokov, Zh. Turkov, INIS, A Feasibility Example of a Modern International Information System with Decentralized Input Preparation, DEVSIS (1974) W.P. 6.

of the problems posed by the DEVSIS proposal. The incorporation of a subject index in the printed INIS-Atomindex had made it much more useful to developing countries. The paper's conclusions, summarizing the factors that contributed to INIS's successful inception, showed what might be expected of other co-operative systems.

AGRIS

Mr. East spoke to working paper no. 7 ⁽¹⁾, which pinpointed aspects of AGRIS experience that were relevant to the DEVSIS proposal. Service to users should be emphasized and objectives clearly spelled out. AGRIS experience, following that of INIS, suggested that the time scale of the DEVSIS proposal was rather optimistic.

INTRODUCTION OF DEVSIS PROPOSAL ⁽²⁾

Mr. Woolston had already circulated his proposal and had received many comments from participants and other interested people. In introducing it, he compared information services in various fields of knowledge. In the natural sciences, information was concentrated in a few well-established services, in which the user could have complete confidence. In the applied sciences, most literature was under bibliographic control but the user lacked one comprehensive service. In economic and social development, however, much literature was neither properly published, nor under bibliographic control. Consequently, the user could not know with confidence what had been done before and there was much waste in what was perhaps man's most important activity. Mr. Woolston asked whether we had our priorities right? The considerable duplication in the handling of social and economic literature could be eliminated by pooling existing resources. But a world system could not be expected to grow naturally from a

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- (1). H. East, AGRIS, An Evolving System for International Co-operation in Providing Information in the Fields of Food and Agricultural Science and Technology, DEVSIS (1974) W.P. 7
 - (2). J. E. Woolston, DEVSIS, A Development Science Information System, IDRC-doc-041, International Development Research Centre, Ottawa 1974.

small beginning and would need an international stimulus to reach developing countries at reasonable cost to them. Any initial system would be judged on the usefulness of the information it provided and on how rapidly it approached comprehensiveness. Mr. Woolston asked the meeting to consider whether such a system was needed, and if so to plan what had to be done in the next year or two to define it with sufficient precision so that commitments could then be forthcoming.

DISCUSSION OF A POSSIBLE SYSTEM

Mr. Woolston presented working paper no. 3⁽¹⁾, which had been written in an attempt to identify questions for the meeting to consider.

Points of major importance arose during all parts of the meeting. The discussions have been grouped under the headings below, together with an indication of differences of opinion and matters for further consideration.

The Need for a Development Sciences Information System

The meeting considered lack of critical information to be a major constraint upon development planning. Poor access to existing knowledge had led to many examples of duplication and waste in development efforts. The various information activities that had tried to remedy this situation had also tended to duplicate each other, thus revealing a need for co-ordination. The participants generally agreed that better mobilization of information would greatly assist development activities. In addition to the co-sponsors of the meeting in their initial statements, the representatives of the UN, the Asian Institute, CLADES, UNDP, IBRD, CNRS, UNIDO, ICSSD and DSE made positive statements of support for this aspect of the DEVSIS proposal; but when the details of DEVSIS were examined, it became evident that a range of related fundamental questions needed further examination: e.g. to what extent will the consumer be satisfied with improved access to basic documentation, and will he require

(1). Working Paper Offered for Discussion under Item (4) of the Agenda, DEVSIS (1974) W.P. 3

condensation and evaluation of available material before he will accept it? How can the national infrastructures be developed to permit real exploitation of any new international service? Can a new service be demonstrated on a small scale, or are the inter-relationships so important that only a comprehensive service will respond to needs?

Relevance of the Proposal to the Development Process

How relevant the proposal was to users' needs was considered the most important factor in gaining acceptance. Though users in developed countries had development information problems of their own, relevance to developing-country needs was given paramount importance. A system could be set up that would well serve developed-country interests but would be unacceptable if it went no further. Poor access to suitable systems and services, whether national or international, could be considered a characteristic of under-development.

The developing-country representatives felt strongly, however, that a system designed by developed-country organizations on the grounds that access to information was good in itself would have little chance of success. Even though developing countries might express interest, they would not actively participate in an international effort unless convinced of its immediate usefulness to their needs. The DEVSIS proposal might have been made in response to needs expressed formally and informally on many occasions, but by itself this was insufficient motivation for active participation.

Other speakers pointed out that developing countries could benefit from an international system in another way, as it would help them to define what needed to be done at the national level with national literature collected primarily for national use. A system would involve strong national units assisted but not controlled by an international body, and developing countries would be involved in its design and possibly in any central processing. DEVSIS was an attempt to mobilize resources to meet national needs first, but nations would then be able to tap a much larger body of potentially useful information.

Nevertheless, it became evident that the disparate needs of developing countries, and also of developed countries, had to be identified much more clearly before an international effort could be launched.

Evaluation of Present Activities

Little was known about the actual uses made of existing information systems, of the references they provided, and of the documents they flagged; much less about their contribution, if any, to development decisions. The use of INIS outputs had not been systematically studied within each individual country participating in the system. AGRIS was not yet in regular operation, although the user response to the experimental issue of Agrindex had been overwhelmingly positive. Comparisons with these two systems might not be valid for DEVSIS, however. There were dangers in relying too heavily on previous successes under different conditions, and no comparable world systems existed in the field of economic and social development.

Nevertheless many lessons could be learned from previous activities, particularly those that had failed for reasons other than technical. It was suggested that any new system must be based upon existing activities and must first help remedy their problems. Perhaps better co-ordination and integration would meet many requirements without starting a completely new system. A comprehensive survey of all relevant activities and resources, including those in national institutions, and investigations into their effectiveness in solving users' problems were suggested as prerequisites to any new international initiative.

In this regard, there was some difference of opinion as to whether cost-effectiveness could be measured, particularly of a system that might take several years to mature. A cost/benefit calculation, in the accounting sense, might be demanded by the present tightness of budgets, but quantification of some aspects would be impossible. Some inputting costs could be estimated fairly easily (INIS and AGRIS central processing costs are of the order of \$500 000 per annum), but decentralized operating costs would be much more difficult to establish. Against these, an appreciation of effectiveness would be necessary to attract funding. This could only be achieved by much better feedback from users.

Target Groups and the Involvement of Governments

Though any international effort should probably involve inter-governmental organizations, non-governmental organizations, the academic community, and private corporations, the co-operation of national governments was considered essential. They voted the budgets of international organizations and controlled the national bodies participating in them. They would also want to decide whether to participate directly or through regional arrangements. The problems of international co-operation in information activities were not technical but organizational, political and financial, and it was national governments that had to be convinced of the need. Most governments had yet to give a high enough priority to this type of work, and their staff tended to be discipline or sector-oriented.

The individuals who would have to do the convincing would generally be members of the staff of national planning bodies, who would act as gatekeepers to the information store. In the development of an international service, these individuals should therefore be part of the target audience, which should be clearly defined.

Strengthening of National Information Infrastructures

There was complete agreement that assistance to nations taking part in any international program should receive great emphasis. Though information infrastructures in some developing countries were quite sophisticated, others needed considerable strengthening. Without this, the best intentions would fail. The capacity of developing countries to participate in international systems and to use them was a major limitation upon co-operative efforts. Training activities and the establishment of multipurpose national documentation centres should begin now. They would not conflict with plans for international co-operation but rather would be complementary, as any international system would be at least five years in the preparation.

An International Host

It was generally accepted that any international system or service for development information should eventually be adopted by a

member of the UN family. INIS particularly had demonstrated the stimulus of such an endorsement. It was impossible at this stage, however, to be more specific, and, though the methodology of the host institution might be important in defining technical details, it was unrealistic to expect any institution to consider adopting DEVSIS without much more detailed information on such matters as costs and necessary development work.

There was no question, however, that an international operation would have to be placed within the framework of UNISIST to provide the necessary links with other activities.

Project Demonstration

No commitments to a DEVSIS type of proposal could be expected until it was more clearly defined. Several participants therefore favoured a stepwise approach starting on a pilot scale to demonstrate the feasibility and utility of the proposal. Sufficient checkpoints and evaluations must be built in to enable priority-setters to appreciate its effectiveness. Interested organizations would be more likely to support a phased development, which would acquire in a rational manner the necessary experience for future extension. This idea was generally accepted, several suggestions being made for limiting the scale of the pilot operation, by subject, by type of material, or by region.

Subject Scope

To produce a manageable exercise, it was suggested that the subject scope of the pilot project be limited to a few or only one subject in a high priority area, such as public financing or project evaluation. Some participants felt that choice of a suitably self-contained subject could give a reasonable appreciation of inputting difficulties, users' needs, and the potential of the resulting service. Others believed, on the other hand, that, as economic problems were generally interrelated, this appreciation could only be obtained from a broad scope that would not prejudice developing countries' needs at any one time. INIS experience with a limited subject scope might not be very relevant to DEVSIS, but had been that proportionately more selection work was needed at input, and that

the system's usefulness was not indicated until full scope had been achieved.

As for the full subject scope of the eventual system, a complete and precise definition was too large a task for the meeting, but principles were discussed. Six broad topics had been suggested in working paper no. 3, to which could be added planning studies, planning methodology, and sectoral development policy. The Macrothesaurus had been developed pragmatically and the suggestion that it should be used as the basis for a subject scope definition which would take into account the actual demand for information was received favourably. Some participants wanted to broaden the subject scope beyond economic and social matters to include political, technological and administrative questions. Others were worried about the exclusion of certain sectoral information. Some broad documents would inevitably fall within the scope of more than one system, and some overlap would be necessary. This problem would be alleviated, however, by ensuring that all these systems were in the framework of UNISIST, one of whose main aims was to establish links between systems in different subject areas and with different missions. It was recommended, therefore, that systems interconnection should receive first priority in considerations of subject scope.

Coverage

Though material needed for development included rosters, project information, data and documents, the DEVSIS proposal had been limited to documents in order to give a manageable system. Data, particularly raw data, were much more difficult to process, especially for comparative purposes. Several participants felt, however, that information on institutions and people was as important as documents. Others suggested that if the limitation on the pilot project was to be coverage, emphasis could be given to mimeographed reports and documents not published in the conventional sense. These might be more important than published material, and were particularly difficult to locate at present. This type of material could remain extremely difficult to collect, however, even with a co-operative system, and it could be

difficult to assess the service value of a pilot operation emphasizing it.

Technical Problems

The technical problems of a development sciences information system would probably be like those of INIS and AGRIS and the meeting did not doubt that they could be solved. Agenda items 4b and c (input sharing, mechanisms for assembling input, processing) were not therefore discussed. Computer systems would probably be needed and if located at a central unit would be useful for training purposes. Individual inputting centres would not necessarily need them, however, and there were pleas not to introduce capital-intensive high technology too early.

RECOMMENDATIONS

It was assumed during the meeting that some sort of task force would be needed to carry the proposal further. Many participants emphasized that such a group would need very explicit guidelines. As a result of the discussion, however, its immediate function changed from systems design to definition of alternative proposals backed by adequate information. It would therefore involve a variety of people, in addition to technicians. A steering committee as well as, or possibly incorporating, a technical task force was then suggested. Developing countries should be deeply involved, but it would be difficult to convene their participants for the several months needed. The idea was therefore adopted of a steering committee supported by a secretariat from some suitable body and with resources to use consultants, convene groups, travel, and interact with eventual operators and users of the system.

These considerations, together with some of the major topics discussed at the meeting, were incorporated in a document prepared by a drafting committee and agreed, after amendment, by the meeting as a whole: - "Recommendations of the Meeting on the Feasibility of an International Information System for the Development Sciences (DEVSI), Ottawa, 11 to 13 June 1974." These "Recommendations", which have already been distributed to participants and other interested parties, welcome the

initiative of the DEVSIS proposal and cover the objectives of DEVSIS, general recommendations, establishment of a steering committee and study team, terms of reference of the steering committee, and additional issues for the consideration of the steering committee. The steering committee is asked to take into account the various observations made during the meeting and outlined in this summary record.

INTRODUCTION

At the initiative of the International Development Research Centre (IDRC) and in collaboration with the Organization for Economic Co-operation and Development (OECD) and Unesco (within the framework of its UNISIST program) a group of representatives from national and international institutions met in Ottawa from the 11th to the 13th of June 1974 to study a proposal dealing with the establishment of an international information system in the field of economic and social development, ^{here called} ~~to be known~~ as DEVSIS. This proposal has been examined in the light of the experience acquired by existing and planned initiatives in fields such as atomic energy (INIS) and agricultural sciences (AGRIS) and of the specific recommendations contained in Chapter 6 of the "Study of the Capacity of the United Nations System" (1969). ^{welcomed the ~~responsibility~~ initiative} ~~Participants have unanimously recognized the feasibility and timeliness~~ ^{development} ~~of the DEVSIS proposal in view of the ever growing information needs and~~ ^{need for further study} have formulated a series of recommendations and specific proposals for the pursuit and follow up of this initiative.

OBJECTIVES OF DEVSIS

The objectives of ~~the~~ DEVSIS ~~system~~ should be:

- (a) to ~~provide~~ ^{cc + soc} improved access to information to ~~all those~~ ^{+ implementation of} involved in the formulation of development policies; ^{activities}
- (b) ~~to provide better information~~ ^{academics and researchers;}
- (b)(c) to foster the building of the national and international resources ^{+ instruction} needed to meet this goal;
- (c)(d) to improve the co-ordination between the existing development information facilities, and
- (e) to avoid ^{unnecessary} duplication and waste of resources ~~currently being expended in this field.~~

Amendment Proposed By

Mr. L.A. Shapiro, UNDP

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Substitute for the ~~sixth~~ paragraph on page 3 of "Recommendations" -

"The committee will be requested to seek support and resources from interested organizations necessary for the developmental work to be carried out for DEVSIS as set out in this report. In this connection, the meeting takes note ^{of} ~~that~~ the generous assistance that has already been provided by IDRC and expresses the hope that IDRC will continue this important support for this undertaking."

4 It is recommended that a representative
be body for the steering
Committee & so on.

GENERAL RECOMMENDATIONS

1. Within the overall concept of evolving a long-term programme for economic and social development information of broad scope, a ^{international} development information system should be prepared, which would:

- (a) be directed at meeting the priority information needs of developing countries; and
- (b) provide information services to users working in the development field ~~both~~ at the governmental, academic and international levels in developed as well as developing countries; and
- (c) be responsive to expressed needs of its users and be able to adjust itself to changing needs within a constantly evolving world context.

2. The system should be developed within the conceptual framework of the UNISIST programme and its design should take into account the experience of existing and planned international information systems. All ~~member states~~ ^{countries} would be encouraged to include development information activities as an important component of national ^{development} information policy planning.

3. Published and unpublished literature, and where appropriate certain forms of factual information ^{sh}ould be included. From the beginning the system should take in relevant information to be extracted from data bases of existing national and international ~~systems~~ ^{sources}.

4. The system should be ^{located} managed ~~at the intergovernmental level~~ within the United Nations family. It would be based on voluntary cooperation, and active participation of all member states in a network would be encouraged as well as that of inter-governmental and non-governmental bodies concerned with problems of development.

5. Preparation of input to the system would be decentralized, and would be merged at a central point. Likewise, the various products of the system would be disseminated in the manner most appropriate to reach the various categories of users.

6. The delineation of the subject scope to be encompassed and the detailed design of the network system should be entrusted to a Steering Committee.

GENERAL RECOMMENDATIONS (Cont'd)

7. This Steering Committee would arrange for a feasibility study to be undertaken at the earliest possible date and take the necessary steps.

ESTABLISHMENT OF A STEERING COMMITTEE AND STUDY TEAM

In order to take the action necessary for bringing the Concept of DEVSIS into fruition, the meeting recommended that a Steering Committee should be appointed immediately and convened under the auspices of the UNISIST programme, by four sponsoring agencies, i.e. IDRC, OECD, UNDP and UNESCO. Every endeavour should be made to hold the first meeting of the Committee by the end of July '74, *as a.p.*

2. The Committee should be composed of approximately 8-10 persons. In deciding the composition of the Steering Committee, the sponsors are requested to ensure that there is a proper representation of (a) Development scientists and Information scientists and (b) Third World countries and Industrialized countries.

Study Team 3. The Committee will be assisted in its work by a small full time Secretariat headed by a Project Director, who would be appointed by the sponsoring agencies (and would himself be a member of the Steering Committee). *Study Team* The Secretariat will be manned from persons loaned by participating institutions and/or by recruitment of external consultants. *Study Team*

4. It is envisaged that the participating organizations will provide host facilities.

5. Financial support will be requested from the IDRC for the work of the Steering Committee and the Secretariat.

is 6. It ~~was~~ recommended that the Steering Committee should endeavour to complete the draft of its proposals for DEVSIS by early 1975. Thereafter, further consultations and preliminary negotiations will be conducted with *interested* sponsoring Governments and *institutions* ~~major donors~~ so that a *resolution* ~~resolution~~ calling for the establishment of DEVSIS may be presented to the Economic and Social Council of the United Nations ~~at its meeting in July 1975.~~ *if possible*

ESTABLISHMENT OF A STEERING COMMITTEE (Cont'd)

7. The responsibility of the Steering Committee will cease when an appropriate organ of the U.N. family accepts responsibility for DEVSIS.

TERMS OF REFERENCE OF THE STEERING COMMITTEE

The Steering Committee shall:

1. ~~Appoint a study team~~ for the preparation of the DEVSIS feasibility study, *taking into account system, especially as regards*
2. Define the content of the feasibility study, and especially;
 - a) the need for an international service or system,
 - b) a statement of purpose, *of DEVSIS*
 - c) subject scope and coverage,
 - d) basic parameters such as number of references, estimates of users of DEVSIS products, etc.,
 - e) relationship in terms of audience, scope and coverage to other systems,
 - f) technical specifics of the system such as:
 - i) methods of identification and subject control
(cataloguing, abstracting, indexing, use of Macrothesaurus),
 - ii) input and output processing,
 - iii) programmes for computer handling,
 - iv) *products + users*
 - g) organization of the system, its possible location and responsibilities of participants,
 - h) costs and possible financial resources, and
 - i) possible legal structure
3. Guide and supervise the conducting of the feasibility study.
4. Ensure the compatibility with existing international information systems.
5. Negotiate the location of the system within the U.N. family.

TERMS OF REFERENCE OF THE STEERING COMMITTEE (Cont'd)

6. Negotiate the official support (including financing) from governmental, non-governmental and private organizations.
7. Undertake explanatory actions at national and international levels on the role of DEVSIS in social and economic development.

ADDITIONAL ISSUES FOR THE CONSIDERATION OF THE STEERING COMMITTEE

- (1) Identification of the information needs, and priorities of the policy and decision makers, planners, researchers, and individuals or institutions involved in the development process.
- (2) Analysis of the most appropriate information and information services to support the process of innovation and change with respect to the developing world.
- (3) Survey of the existing activities and facilities in the field of economic and social information in developing and developed countries and in international organizations to ensure (a) needed cooperation and coordination in developing DEVSIS, (b) user orientation of DEVSIS services, (c) that the DEVSIS concept takes account of the absorptive capacity in developing countries and needed improvements to the national and regional information infrastructures for economic and social development.
- (4) Initiate or select pilot projects to serve as experimental tools for the DEVSIS to provide testing of design, system behaviour and user feed-back.

Take to committee and discuss

Meeting on the
FEASIBILITY OF AN INTERNATIONAL INFORMATION SYSTEM
FOR THE DEVELOPMENT SCIENCES (DEVSIS)

Co-sponsored by the
International Development Research Centre
the Organization for Economic Co-operation and Development
and Unesco (within the framework of its UNISIST program)

OTTAWA, 11-13 JUNE, 1974

RECOMMENDATIONS OF THE MEETING ON THE
FEASIBILITY OF AN INTERNATIONAL INFORMATION SYSTEM
FOR THE DEVELOPMENT SCIENCES (DEVSIS)

Ottawa, 11 to 13 June 1974

INTRODUCTION

At the initiative of the International Development Research Centre (IDRC) and in collaboration with the Organization for Economic Co-operation and Development (OECD) and Unesco (within the framework of its UNISIST program), a group of 34 participants from 28 national and international institutions met in Ottawa from 11 to 13 June 1974 to study a proposal dealing with the establishment of an international information system in the field of economic and social development, currently known as DEVSIS. This proposal has been examined in the light of the experience acquired by existing and planned initiatives in fields such as nuclear science and technology (INIS) and agricultural sciences (AGRIS) and of the specific recommendations contained in Chapter 6 of the "Study of the Capacity of the United Nations System" (1969). The participants unanimously welcomed the initiative of the DEVSIS proposal in view of the ever-growing information needs, and they have formulated a series of recommendations and specific proposals for the pursuit and follow-up of this initiative.

OBJECTIVES OF DEVSIS

The objectives of DEVSIS should be:

- (a) to provide improved access to economic and social information to individuals and institutions in developing countries and to all those involved in the formulation and implementation of development activities;
- (b) to foster the building of the national and international resources needed to meet this goal;

OBJECTIVES OF DEVSIS (Cont'd)

- (c) to improve co-ordination between the existing development information facilities, and
- (d) to avoid unnecessary duplication and waste of resources.

GENERAL RECOMMENDATIONS

1. Within the overall concept of evolving a long-term programme for economic and social development information of broad scope, an international development information system should be prepared, which would:

- (a) be directed at meeting the priority information needs of developing countries;
- (b) provide information services to users working in the development field at the governmental, academic and international levels in developed as well as developing countries; and
- (c) be responsive to expressed needs of its users and be able to adjust itself to changing needs within a constantly evolving world context.

2. The system should be managed within the United Nations family. It would be based on voluntary co-operation; the active participation of all member states in a network would be encouraged, as well as that of inter-governmental and non-governmental bodies concerned with problems of development.

3. The system should be developed within the conceptual framework of the UNISIST programme, and its design should take into account the experience of existing and planned international information systems. All countries should be encouraged to include development information activities as an important component of national development and information policies.

4. Published and unpublished literature, and where appropriate certain forms of factual information, should be included. From the beginning the system should take in relevant information to be extracted from data bases of existing national and international sources.

5. Preparation of input to the system would be decentralized, and would be merged at a central point. Likewise, the various products of the system would be disseminated in the manner most appropriate to reach the various categories of users.

6. The delineation of the subject scope to be encompassed and the detailed design of the network system should be entrusted to a Steering Committee.

7. This Steering Committee should arrange for a feasibility study to be undertaken at the earliest possible date and take the necessary steps.

ESTABLISHMENT OF A STEERING COMMITTEE AND STUDY TEAM

1. In order to take the action necessary for bringing the concept of DEVSIS into fruition, the meeting recommended that a Steering Committee should be appointed immediately and convened under the auspices of the UNISIST programme, by four sponsoring agencies, i.e. IDRC, OECD, UNDP and Unesco, and in consultation with the UN Department of Economic and Social Affairs. Every endeavour should be made to hold the first meeting of the Committee by the end of September 1974.
2. The Committee should be composed of approximately 8-10 persons. In deciding the composition of the Steering Committee, the sponsors are requested to ensure that there is a proper representation of (a) Development scientists and Information scientists and (b) Third World countries and Industrialized countries.
3. The Committee should be assisted in its work by a small full-time Study Team headed by a Project Director, who would be appointed by the sponsoring agencies (and would himself be a member of the Steering Committee). The Study Team should be manned from persons loaned by participating institutions and/or by recruitment of external consultants.
4. It is recommended that an appropriate organ of the U.N. family should provide host facilities for the Steering Committee and the Study Team.
5. The Steering Committee should be requested to seek, from interested organizations, the support and resources that are necessary for the developmental work to be carried out for DEVSIS as set out in these recommendations. In this connection, the meeting takes note of the generous assistance that has already been provided by IDRC, and expresses the hope that IDRC will continue this important support for the undertaking.
6. It is recommended that the Steering Committee should endeavour to complete the draft of its proposals for DEVSIS as soon as possible. Thereafter, further consultations and preliminary negotiations should be conducted with interested governments and institutions, so that a recommendation calling for the establishment of DEVSIS may be presented to the Economic and Social Council of the United Nations, if possible in 1975.
7. The responsibility of the Steering Committee should cease when an appropriate organ of the U.N. family accepts responsibility for DEVSIS.

TERMS OF REFERENCE OF THE STEERING COMMITTEE

The Steering Committee should:

1. Arrange for the preparation of the DEVSIS feasibility study taking into account the need for an international information system and, especially, the needs of the developing countries, particularly with regard to the development of their national and regional information systems and services.

TERMS OF REFERENCE OF THE STEERING COMMITTEE (Cont'd)

2. Define the content of the feasibility study, and especially:
 - a) a statement of purpose of the system,
 - b) subject scope and coverage,
 - c) basic parameters such as number of references, estimates of users of DEVSIS products, etc.,
 - d) specific target audiences,
 - e) relationships in terms of audience, scope and coverage to other systems,
 - f) technical specifications, such as:
 - i) methods of identification and subject control (cataloguing, abstracting, indexing, use of Macrothesaurus),
 - ii) input and output processing,
 - iii) programmes for computer handling,
 - iv) products and user services, including availability of full texts,
 - g) organization of the system, its possible location and the responsibilities of participants,
 - h) costs and possible financial resources, and
 - i) possible legal structure,
3. Guide and supervise the conducting of the feasibility study.
4. Ensure compatibility with existing international information systems and standards.
5. Negotiate the location of the system within the U.N. family.
6. Negotiate official support (including financing) from governmental, non-governmental and private organizations.
7. Undertake explanatory actions at national and international levels on the role of DEVSIS in social and economic development.
8. Undertake any other matters deemed relevant by the Steering Committee.
9. Give consideration to the need for a review conference on DEVSIS progress in 1975 and take account of the offer of the Deutsche Stiftung für Internationale Entwicklung to host such a meeting.

ADDITIONAL ISSUES FOR THE CONSIDERATION OF THE STEERING COMMITTEE

- {1} *The identification of the information needs, with reference to the priorities of policy and decision makers, planners and researchers, i.e., individuals and institutions involved in the development process.*
- (2) The analysis of the most appropriate information and information services to support the process of innovation and change with respect to the developing world. The analysis might take into consideration such services as are currently being provided by the Society for International Development (SID).
- (3) The survey of existing activities and facilities in the field of economic and social information in developing and developed countries and in international organizations to ensure (a) needed co-operation and co-ordination in developing DEVSIS, (b) user orientation of DEVSIS services, (c) that the DEVSIS concept takes account of the absorptive capacity in developing countries and needed improvements to the national and regional information infrastructures for economic and social development.
- (4) The initiation or selection of pilot projects to serve as experimental tools for the DEVSIS concept, to provide testing of design, system behaviour and user feedback. On-going activities could be considered, such as: the functioning of CLADES as a regional example, the functioning of the Deutsche Stiftung as a national example, the functioning of the SID/Service de Références Développement (SRD) as an international example, the functioning of the UNIDO and FAO systems as sectoral examples, the functioning of ILO/ISIS as an example of an organization's internal system.

In carrying out its function as described above, the Steering Committee should give close consideration to the various comments and observations made by the participants at the DEVSIS meeting in June 1974.



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POUR DIFFUSION IMMEDIATE

Plan d'action coopérative pour la mise en place d'un système mondial d'information

Des représentants de 34 institutions nationales et internationales se sont réunis à Ottawa du 11 au 13 juin afin d'étudier une proposition visant à la mise en place d'un système international d'information dans le domaine du développement économique et social, système connu sous le nom de DEVSIS.

Cette réunion était organisée conjointement par le Centre de Recherches pour le Développement International (CRDI), par l'Organisation pour la Coopération et le Développement Economiques (OCDE) et par l'Organisation des Nations Unies pour l'Education, la Science et la Culture (UNESCO).

Les participants ont recommandé que quatre organisations, le CRDI, l'OCDE, l'UNESCO et le Programme des Nations Unies pour le Développement, de concert avec le Département des Affaires Economiques et Sociales des Nations-Unies, mettent en place le plus rapidement possible un comité d'organisation. Ce comité devra préparer des propositions précises relatives à la forme à donner au système et entamer des négociations préliminaires avec les organismes et gouvernements accordant leur soutien à ce système.

L'Assemblée a convenu que le comité d'organisation, composé de 8 à 10 personnes, serait composé à parts égales de représentants du Tiers-Monde et de représentants des pays industrialisés, ainsi qu'à la fois des spécialistes de l'information et des décideurs en matière de politiques de développement.

Ce même comité devra préparer une recommandation demandant la mise en place du système DEVSIS au sein des organisations affiliées aux Nations Unies, recommandation qui devra faire l'objet d'une présentation au Conseil Economique et Social des Nations Unies.

Les représentants réunis à Ottawa ont pris acte du besoin urgent de faire un meilleur usage, à des fins de développement, des renseignements économiques et sociaux disponibles ou pouvant le devenir dans divers centres et dans divers pays.

Ils ont cependant mis l'accent sur la nécessité de préparer soigneusement la mise en forme du système afin de s'assurer qu'il pourra être utilisé de la façon la plus efficace par les planificateurs et par les décideurs des pays en voie de développement ainsi que par l'ensemble des chercheurs s'occupant de développement. Il devra tenir compte de toute l'infrastructure actuelle en matière d'information dans le Tiers-Monde.

à suivre ...

The study will build upon the experience acquired by existing and planned information initiatives in fields such as nuclear science and technology (INIS) and agricultural sciences (AGRIS).

Representatives stressed that a DEVSIS program should provide for decentralized input and output, and for a central processing facility; the various products of the system should be disseminated in the manner most appropriate to reach the various categories of users.

The Ottawa meeting was hosted by the International Development Research Centre, which is a public corporation established by the Parliament of Canada to support research designed to adapt science and technology to the specific needs of developing countries.

For more information:

24-06-74

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INTERNATIONAL
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FOR IMMEDIATE RELEASE

Plans set for cooperation on worldwide information system

Representatives from 34 national and international institutions met in Ottawa from June 11 to June 13 to study a proposal dealing with the establishment of an international information system in the field of economic and social development, at present known as DEVSIS.

The meeting was held under the joint sponsorship of the International Development Research Centre (IDRC), the Organization for Economic Cooperation and Development (OECD) and the United Nations Educational, Scientific and Cultural Organization (UNESCO).

The meeting recommended that four organizations - IDRC, OECD, UNESCO and the United Nations Development Program - should, in consultation with the Department of Economic and Social Affairs of the United Nations, convene a steering committee as soon as possible. This steering committee should prepare detailed proposals on the shape of the system and to begin preliminary negotiations with sponsoring agencies and governments.

It was agreed that the steering committee, of 8 to 10 persons, should comprise a balance of representatives of both Third World and industrialized countries, and should include both information scientists and development policy makers.

The steering committee will aim to prepare a recommendation, calling for the establishment of DEVSIS within the United Nations family, for eventual presentation to the Economic and Social Council of the United Nations.

Representatives at the Ottawa meeting agreed on the urgent need to make better use, for the purposes of development, of the social and economic information that is or can be made available in various centres and countries.

It was stressed, however, that careful preparation on the shape of the system would be necessary to ensure that it will be of the most effective possible use to planners and policy makers in developing countries, and to the development research community. Full account will be taken of the existing information infrastructure in the Third World.

As a result, the steering committee is being asked to establish a team to do a full study, including the scope and coverage of the subjects that may be included in DEVSIS.

Il est donc demandé au comité d'organisation d'organiser une équipe de chercheurs qui effectueront une étude complète du problème, notamment de la portée et de l'ampleur des sujets pouvant être inclus dans le DEVSIS.

Cette étude se fondera sur les connaissances acquises par les systèmes d'information existants ou qui sont en voie de création dans des domaines tels que la science et la technologie nucléaires (INIS) et les sciences agricoles (AGRIS).

Les représentants ont souligné qu'un programme DEVSIS devrait fournir des moyens d'entrées et de sorties décentralisés ainsi qu'une installation centrale de traitement; les différents produits du système devront être diffusés de la manière qui permettra le mieux d'atteindre les différentes catégories d'utilisateurs.

La réunion d'Ottawa s'est tenue au Centre de Recherches pour le Développement International, corporation publique instituée par le Parlement du Canada en vue d'appuyer les travaux de recherche visant à adapter les moyens scientifiques et technologiques aux besoins précis des pays en voie de développement.

Pour de plus amples renseignements, s'adresser au:

24-06-74

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