

THE INTERNATIONAL DEVELOPMENT RESEARCH CENTRE
AND COMPUTERIZED RETRIEVAL SERVICES (LE CENTRE
DE RECHERCHES POUR LE DEVELOPPEMENT INTERNA-
TIONAL ET LES SERVICES AUTOMATISES DE RECUPERA-
TION)

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ABSTRACT

The International Development Research Centre (IDRC) was established in 1970 by an Act of the Canadian Parliament to conduct research into the problems of the developing regions of the world. The work of the Information Sciences Division is described with reference to some specific programs and their connection to international systems. (Le Centre de Recherches pour le Développement International (CRDI) a été créé en 1970 par une loi du Parlement canadien afin de poursuivre des recherches sur les problèmes des régions du monde en voie de développement. Les travaux de la Division des sciences de l'information sont décrits par référence à quelques programmes particuliers et à leurs liens avec des systèmes internationaux.)

The Integrated Set of Information Systems (ISIS), developed by the International Labour Organization (ILO), is employed as a library management system. ISIS is outlined with emphasis on its retrieval functions. How the bibliographic data bases hosted on ISIS are used to provide researchers in remote areas as well as those in Ottawa with up-to-date information in their respective fields is described, with close cooperation between programmers and systems analysts and the library seen as a key to making it work. (La Bibliothèque a adopté pour sa gestion, le système ISIS (Ensemble Intégré de Systèmes d'Information) élaboré par l'OIT (Office International du Travail), reconnu pour la qualité de ses opérations de récupération. Suit une description du mode

d'utilisation des banques de données bibliographiques emmagasinées par ISIS qui peuvent fournir aux chercheurs d'Ottawa aussi bien qu'à ceux des régions éloignées, les plus récentes informations dans les domaines qui les intéressent. La coopération étroite entre programmeurs, analystes de systèmes et la bibliothèque est présentée comme la clef du bon fonctionnement de l'entreprise.)

Introduction

The International Development Research Centre is a public corporation established in 1970 by Act of the Canadian Parliament "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 these regions". We were born out of the rethinking about economic and social development at the end of the first U.N. Development Decade, and provide a research activity to complement Canada's already large budget for development aid. On the global scene there are other aid agencies that have library and information science activities, but we are one of the few to have a programme division - Information Sciences - specifically working in this area. We have four other programme divisions - Agriculture, Food and Nutrition Sciences, Population and Health Sciences, Social Sciences and Human Resources, and Publications - which are oriented towards the rural populations and the semi-arid regions of the world, where comparatively little research has been done. Within the broad terms of the Act, our international Board of Governors has developed a policy of responding to project proposals from developing country institutions by funding research carried out there by local people. The projects we support must have a broad regional impact rather than be of importance to only one country, as it is the Canadian International Development Agency that administers the taxpayers' funds for technical assistance.

Information Sciences Division and International Systems

The Information Sciences project programme in developing countries is mainly support for research in other subjects rather than research into information sciences themselves. We also provide information services to Centre staff and others working in the field of international development, but of this year's budget of some \$7 million, roughly \$6 million is aimed at developing-country projects. The distinction between project work and service to the Centre is not clearly defined, and many of our decisions about our in-house work in Ottawa have been influenced

by its possible future importance to developing countries. If only local factors had been taken into account, our library and information services might have been quite different.

As information sciences could mean all things to all people, we have tended to concentrate our attention on those subjects of direct interest to the other programme divisions. In practice, our programme has blossomed in areas where an international, preferably United Nations, agency has taken the lead in setting standards that all can follow. Our association with international organizations has been made closer by the dearth of developing-country institutions that have the staff and expertise independently to draw up supportable project proposals. Thus one of our first interests was AGRIS, the International Information System for the Agricultural Sciences and Technology of the Food and Agriculture Organization. AGRIS, which went into regular operation at the beginning of 1975, is attempting to collect the references to the world's current agricultural literature, estimated at a quarter of a million documents annually, conventional and non-conventional. National and regional centres collect the local literature, describe it bibliographically, categorize and roughly index it, and send the data - on worksheets or in machine-readable form - to the international coordination centre, which produces a world file. The outputs - a printed bibliography and a magnetic tape - are provided as required to each national or regional centre, which then use them as the basis for its local output services. The pattern for such a mission-oriented documentation system was set by INIS, the International Nuclear Information System of the International Atomic Energy Agency, which did not conflict unduly with existing services and for which it was relatively easy to identify one principal institution in each participating country. AGRIS has demonstrated the practical difficulties of cooperation in a broad subject handled by many institutions in each country and also by several well established information services. At the same time, Unesco's UNISIST programme is showing the importance of ensuring international compatibility if the free exchange of scientific information is to be accomplished.

Much of IDRC's efforts in connection with AGRIS have gone towards helping developing countries take part. For example, we are funding a unit which converts developing-country worksheets into machine-readable form, and we are supporting two large regional input-output centres, one in Latin America, the other in Southeast Asia. These regional centres facilitate the training of national staff, particularly if they speak a common regional language, and also the introduction of mechanization with a large computer. They are also the focus of other regional activities, such as union lists, interlibrary loan services, SDI and current awareness services, and regional associations of specialized librarians and documentalists. We are supporting a similar regional centre in Latin America handling population information, which might

ultimately be a component in another international mission-oriented network which is now being studied - POPINS, the Population Information System.

Despite the advantages of regional participation in international systems, many countries will eventually want to participate directly. The impact of the present international systems is, however, limited by the weakness of many national institutions. We are thus moving cautiously into the field of national information infrastructures, bearing in mind that the Canadian International Development Agency provides technical assistance. We are therefore concentrating on national projects that would make important research information accessible through the international network, and on innovative projects involving such new techniques like optical character recognition, which has given promising results with decentralized input to AGRIS.

Since INIS and AGRIS demonstrated the feasibility of international cooperative information systems with decentralized input and output and centralized merging of a world file, our main thrust has been towards a similar system to handle information about development itself - the vast body of literature on economic and social trends and analyses, prescriptions for decision making, development experiences, evaluation of development programmes and resources for development information that is important for planners and policy makers. Much of this literature is at present spread incompatibly among U.N. agencies, aid organizations, and national bodies. At the end of 1973, IDRC proposed a new system DEVSIS - Development Sciences Information System - and in 1975 played a large part in a feasibility study that strongly recommended the adoption of DEVSIS by an appropriate U.N. body. Although chronologically, DEVSIS followed AGRIS in our programme, the need for a development information system has long been evident since we were established, and our library and computer activities were begun with such a system in mind.

The IDRC Library

The library began late in 1971, with the mandate to develop a collection to meet the varied needs of the IDRC staff in Ottawa and in the field. Beginning with a collection that had been stuffed into the overflowing bookcases of Centre staff members, we now have about 13 000 items in our own data base and some 3 600 current serials handled by a staff of six professional librarians, four indexers and thirteen technicians and clericals. The library acquisitions policy has followed closely the projects worked on in each of the Centre's programme areas, and on the general area of social and economic development. What we cannot or do not want to purchase and process ourselves, such as highly technical materials, we borrow from other libraries. We are, then, a net borrower in the interlibrary loans section. However, with the growth

of our collection and the increasing publicity which it receives, we are receiving more requests for bibliographic searches and subsequently more requests for our books and documents from university students, from government departments and agencies, and from people at various levels in developing countries.

The main emphasis of the library is thus on development as a subject in itself, together with the more general works on subjects of specialized interest. Eventually we could become the principal Canadian library on development, particularly as we are likely to be the Canadian input-output centre for DEVSIS and have already provided experimental input.

Before leaving for field posts, project advisors are given a library familiarization tour as part of their general orientation to headquarters staff and facilities. At that time searching potential is described and several searches may be done for them on any or all of the data bases. The relevant items listed in the printouts may be purchased for the project, photocopied, or obtained on location. Project officers with access to a university or a specialized research collection can often locate relevant materials themselves within a reasonable distance. CAN/SDI profiles and retrospective searches of Lockheed Information Systems' DIALOG are run for these people as well with the library reference and interlibrary staff providing the necessary backup from Ottawa.

ISIS

In 1973 we anticipated an international system like DEVSIS in which we and many developing countries would take part, by implementing the Integrated Set of Information Systems (ISIS) on a service-bureau computer. ISIS, developed by the International Labour Organization (ILO), is employed primarily as a library management and bibliographic retrieval system. It is an automated, integrated, interactive information system. It was programmed in Assembler language to run in a 48K partition on a medium-size IBM 360 computer operating under the Disk Operating System (DOS).

Once data have been entered, they can be used in any number of processes. Data are input at the document acquisitions stage and updated or corrected as new information becomes available. Purchase orders, claims and cancellations can be generated as appropriate. When a document has been accessioned and its record is deemed to be totally correct by the library cataloguing staff, it is transferred to the master file for our own data base.

In both the entry and the search process, the user is prompted and guided. At all stages in the search, he/she is able to review the results thus far obtained and to revise the search accordingly. All the tasks that can be performed on-line using the terminal can also be done in batch mode using card input.

ISIS currently hosts four data bases: BIBLIO, also called the IDRC file, composed of documents from the library and our only subject access to the collection; the IIO data base also the subject access to its library collection; and the data bases of the United Nations Industrial Development Organization (UNIDO) and the Food and Agriculture Organization (FAO), which are abstracted lists of their own publications. We obtain the last three in exchange for copies of our own data base. Note that most of these are quite technical and more specialized than our own data base; we find them excellent assistance in meeting project officers' more specific needs.

Searches are done on request by the library reference and indexing staff; that is, they are treated as normal reference questions. Indeed, since we have no printed subject index to our own collection, every subject enquiry about library holdings necessitates a computer search. Using the thesaurus, a search is formulated before approaching the computer terminal, and is then keyed-in on a cathode-ray display terminal (a Vucom I is currently being used).

Number of postings for each term is displayed as is a running total of hits resulting from combinations of terms using Boolean logic. At any time in the search, one can display an item or so to determine whether or not the search is retrieving what one is looking for. Hits can be printed immediately on a slave printer or, by answering 'Yes' to the prompt 'Printout required?', hits can be printed in batch mode overnight on the high speed printer.

For writing the abstracts, in which indexing terms are embedded, a thesaurus is used, namely the Macrothesaurus. A basic list of social and economic development terms, compiled by the Organization for Economic Cooperation and Development (OECD), with financial support from the IDRC. The "Macro" reconciled the vocabularies of several agencies in the same field who were developing thesauri of their own. Since the users of the Macrothesaurus are rather diverse and so far there has been no continuing caretaker operation, we are now seeing these users changing and enlarging the "Macro" to suit their particular requirements. Thus IDRC has added about 35 terms which were not in the original thesaurus. We hope this problem will be solved by bringing the Macrothesaurus under the umbrella of the DEVSIS central management.

Since each organization utilizing ISIS is charged by contract with ILO with developing the system in some way and since the thesaurus is multilingual (published in English, French, Spanish, German and Arabic and soon in Portuguese and Indonesian), we decided to devise a multilingual searching capacity. This has now been accomplished. When a searcher keys in the English terms, hits on documents indexed by the equivalent terms in French are picked up as well. The reverse is also true. Using the command "language French" one may key in the French terms and pick up all the English hits too. At present there are only English and French capabilities but the system could handle many more languages if the data base contained entries indexed in them.

ISIS and the Library

IDRC instituted ISIS originally in order to gain sufficient knowledge and practice in its operation to be able to place the whole system into a developing country situation, thus enabling a developing country organization to participate actively in world-wide or regional information systems such as AGRIS and DEVSIS. We have in fact just added one person on the IDRC ISIS team to be responsible for making developing countries aware of this possibility and for aiding them in setting up computerized centres for AGRIS or DEVSIS input-output and for their own purposes. It was for this reason that we organized the library and the ISIS team as separate units.

As there is no printed subject catalogue to the collection, the library relies heavily on the smooth functioning of ISIS at all times. This is an impossible dream but in efforts to attain it, a close cooperative relationship between the library staff and the ISIS systems analysts and programmers is absolutely vital. Without the analysts and programmers the library could not develop alone the applications required to fulfil its mandate; without strong constructive input from the library staff the ISIS group is hampered in its evolution. Now the systems analysts and programmers and the librarians are becoming a single team in the development of the minicomputer version of ISIS.

The main reason for this is to avoid the heavy costs of using a service bureau, and to give us direct control of day-to-day operations. Early last summer a feasibility study conducted by a consultant made a favourable recommendation. On the basis of this, specifications have since been drawn up and benchmark tests devised for testing the suitability of various products for the purpose. And this is the point at which the project stands now. When the work is complete we hope we will not only have solved our in-house problems, we will also have a package of computer programmes that can be used in developing country projects; and we will also be able to provide the hardware at a reasonable cost.

Other Activities

Although this paper has concentrated upon large document systems which take in and then disseminate existing recorded information, this is only one of the ways in which developing countries can attempt to satisfy their needs. In many subjects, the rates of obsolescence of the literature are quite different from those most of us are familiar with; reviews have not yet been written to cover the older literature; important literature is in languages that are difficult to read, and many users require a much more personal service that will give them the information that specifically meets their problem rather than a list of references that might contain it. Thus we are supporting several specialized information centres - on narrow subjects like packaging, soil mechanics, cassava, irrigation and grain legumes - which will provide these more personal services and also improve communications between scientists by issuing newsletters and acting as referral centres. These are all located at centres of excellence in the subject concerned, so that the interaction between research workers and information scientists will be mutually beneficial. Almost all of these centres depend initially upon specialized document collections, however, and when mini-computers are available for bibliographic applications, they should be able to draw their current material from sources like the AGRIS tapes, possibly by merging extracts from several data bases.

IDRC Information Sciences Division has many projects which have not even been mentioned - an industrial extension service in Southeast Asia patterned on the Technical Information Service of the Canadian National Research Council, a French language magazine on family hygiene, research into mass education by radio - all going to show that the subject we are discussing at this Conference has branches into virtually every walk of life.