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The Production, Acquisition and Diffusion of knowledge

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1. AN OVERVIEW OF INFORMATION AND SOCIETY

1.1. HUMAN SOCIETY

Many thousands of years ago man emerged from a shadowy background of which we know little to become the centre of everything: from living a nomads life, he has moved to an agrarian society and appears to be watching a swift transition from a pastorial to an industrial society. Indeed he is now exercising powers of choice and judgement, being capable of optimisation by consciously seeking to modify nature as well as adjusting himself to nature's phenomena.

This process of evolution has been long and the change remarkable; the evidence of history and pre-history even when most fragmentary, is that several sequences in the process can be discerned by the observer today, looking back. These sequences are given different labels, the last of which being civilisation, and the various civilisations seen also as rich and individual variations on a common theme.

The successive developmental changes which man underwent in reaching civilised states were the work of different groups of people at different periods at all the stages of the pattern of change. Besides, the developmental process has particular ends depending upon the particular form in which man expresses his needs: specialisation of various kinds has developed as man's knowledge has increased and his needs have become sophisticated.

This constantly moving process did not proceed unnoticed or unregistered. Actually, every part of it was recorded by its producer, or by a historian moving within it, or surveyed by others from a vantage point outside it and above it.

Thus, whatever form man's activities may take, they are recorded, in some way or another, adding to the existing information resources, and become part of a large and exceedingly complex system of accumulated knowledge. A beachhead on the shores of ignorance became a vast area of knowledge and understanding. The quest for understanding, we now see, will for finite man, be limitless, and will continue as long as there is recognition for the value of the inquiring mind.

1.2. KNOWLEDGE AND ACTION

"Knowledge is power", said Bacon. Our civilisation, whose misteps cannot disfigure its marvelous history and whose dangers cannot discredit its even more marvelous future proceeds from this point. Knowledge is power: but above all it is thought founded upon nature in a certain matter. Knowledge is cientific only through the mind whose product it is and which also gives it meaning and a forclum for application to things. Knowledge for action is, without the least of doubt, the main trait of our contemporary civilisation where action has become an end in itself in our scale of values. It allows man to advance to new frontiers acquiring new knowledge, to understand the road to comprehension of the physical world, to fulfil and justify his

ultimate destiny.

Whatever his motives and objectives are, man needs more knowledge, and any added or accumulated has its effect on his actions allowing him to act effectively. Knowledge opens up high fields for human action, and considerably enhances the indeterminate quality of action, presenting action with an increasing number of choises, some of which are bound to have a decisive effect for the future of the human race.

1.3. WINDS OF CHANGE

However, to act effectively and realisticly man needs to understand the nature and features of the physical world in which he lives. The most important feature of our world is perhaps that it is passing through a period of revolutionary change. Today we are in the midst not of one revolution, but of several, which are rapidly and visibly changing our way of life, our sense of values and our attitudes in the political, social and economic fields. The most important of these revolutions has been due to the upsurge of science and technology.

1.4. SCIENCE AND TECHNOLOGY

After the great political movement which has occupied the foreground of history for the past few decades the Arab States realized that problems of administrative organization, economic growth and social progress have become the dominant concerns of their peoples and their leaders. They are now convinced that the adoption of science and technology is the

indespensable means in reaching a practical solution to each of these problems.

We do know that the place accorded to science and technology and its policy in the development process can only be appreciated within the context of the type of development which is sought, explicitly or implicitly, and the social instrumentalities through which it is to be realized. It is naturally determined by its potential contribution to economic, social and cultural development. It has therefore very close links with other spheres of governmental action intended to keep on the path of progress through a development plan. However, science policy in the region being marginal as sit is it has contended against various adds and obstacles such as lack of capital, inadequacy of scientific and technological infrastructure and capabilities, Cultural adaptation to situation and behaviour, social inhibitions, and the outflow and migration of trained and skilled national human resources.

1.5. PLANNING AND INFORMATION

The need for planning exists for all countries: developed and developing, rich and poor. The formulation of goals and their translation into policies and plans and their execution requires above all awarness and knowledge. In reality, however, the knowledge and policies develop simultaneously.

It is to be noted that when elaborating their development plans, the Arab States were led by the endeavour to increase the

efficiency of their planning pertaining the major social, economic, scientific and technological objectives and activities, to provide for their societies the quickest and most favourable material and cultural development attainable under the prevailing conditions.

Planning being essentially a strategy of options implies building of consensus among the representatives of the different interests involved and demands decision making. These are made possible if there are yardsticks, guidelines, pointers, and precedents. Experience gained through precedents in large numbers builds up a body of data, the raw material from which others derive. When data is processed it results in information. The accumulated systematized, formulated, and evaluated information with reference to the discovery of general truths is knowledge.

Never in the history of the world has there been as rapid a growth of knowledge, and I suppose that, in the 18th century, men talked about how knowledge doubled every 50 years. I think we could make a case for saying that nowadays knowledge doubles every 10 years.

Planning is only meaningful if it leads to practical decisions, and to make decisions, a steady and continuous flow of information is required.[15] A decision implies action, and action will have consequences. These consequences lead in turn to new decisions . Thus planning requires continuous decision making at several levels and the information requirements for these levels or classes of decision vary accordingly. It is thus

evident that decisions cover an enormous range, from small adjustments in daily routine all the way to major ones, and there is a corresponding spectrum of information needs.

1.6. THE IMPORTANCE OF INFORMATION

The above argument has pointed out correctly the existing situation whereby the organisation of man's activities - no matter on whatever level - personal, national or international necessitates communication or transmission of information. Communication is thus essential unless man returns to achieving all his tasks by his own labour: an unlikely arrangement. Information has become part of the general body of knowledge and thus constitutes a resource in the same way as energy, for example - one to which all should have access. Dissemination of information should thus be considered a public service, which does not mean it should be free, nor that it should be wholly or partly financed by the authorities.

The State's role in the development of information systems and networks follows from the responsibilities it must assume [4] :

- firstly in education: dissemination of information is only one of the forms of continuous education and training;
- secondly in the socio-economic development of the nation - it is no longer necessary to demonstrate the role of information in that development.

It is enough to say that it is becoming recognized that information is such an important factor in national progress and well-being that nations can no longer neglect to have national information policies[39]. Information used to be regarded solely as a supportive element in various national programmes, for instance, economic, educational, and environmental programmes. However, information itself is now emerging as a matter of national policy.

2. THE CURRENT STATE OF DEVELOPMENT OF INFORMATION SERVICES IN THE REGION

2.1. INTRODUCTION

After this general appraisal of the role of information an attempt is made below to outline the situation in the Arab States within the ECWA region i.e. Arab States in the Middle East, east of Suez. In pointed terms, the outline will cover "where we are", clarifying "where we ought to go", not where we would like to be, but in which direction we should currently be pointing", and finally "defines by what means we are to get there". Thus giving rather a descriptive statement of the actual state of affairs followed by values and goals or those prescriptions made for change: its content and context. Finally, prescriptions for change that define how this change will come.

However, it is important from the outset - when considering such a vast field in a wide diverse area - to make it clear

that for obvious reasons it is neither the intention nor the scope of this presentation to provide an inventory of ways and means in use in every country in every discipline. On the other hand, it is imperative to provide an outline to show the general prevailing trends.

2.2. COMMUNICATION

The organization of man's activity necessitates communication between one man and another, and growing specialization of activity requires more communication of specialized kinds. The increase in specialization, or the division of labour, in fact both presupposes and generates a greater need for communication: it is the means by which division of labour is secured and co-ordinated. The communication of feeling and of knowledge are activities which have become considerably specialized, and these specializations, under the labels of Art and Science, have become to be regarded as of high importance.

Communication in one sense is the act of transmission of information. It takes place through sight, speech, writing, recording of numbers: that is information may be transmitted in a physical form, or more strictly, the information may be contained in something which is itself transmitted from one point to another; or it may be transmitted in a non-physical form. The first requirement is that there should be an information source: a sender. Human beings, of course, are both receivers and transmitters of information.

2.3. COMMUNICATING METHODS

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In the pre-Roman period, when an agricultural technique developed in the Middle East, it took several centuries to reach the periphery of Europe. In those days, a river or a mountain range presented an almost impenetrable barrier to the movement of information, which depended solely on personal contact.

Today, we have a variety of communication media, including the press, films, radio and TV, means of mass communication, and in addition we have exhibitions, conferences, scientific, technical and trade journals.

2.4. THE JOURNAL

It is significant that personal contact is still considered to be an effective means of stimulating technological and social change. However, the written word remains the primary means of making information available.

A fundamental article of faith in the process of dissemination of knowledge is that the any performed work or activity, the results of which are not communicated and made available to the community, remains incomplete. But inherent in the phrase "made available" are complex problems of definition and of placement of responsibility. Several questions can be raised. Exactly what constitutes availability? Where are the producer's obligation for the achievement of this goal begin and end? How much of the responsibility for ensuring availability rests with the producers organization, the government, the community, and

others? Such problems and others are to be met when considering primary communications.

Traditionally, formal publication in the established literature has been the means of making accruing scientific and technical information available. We expect the basic book and journal article to perform this function for the foreseeable future. Primary communications appear to evolve around:

1. Formal literature, refereed, edited and given bibliographic services for access purposes.
2. Semiformal publications, such as reports, which typically carries reasonable bibliographic control but not usually subjected to refereeing or editing.

Scientific journals - the word science being given the broadest possible interpretation - provide a system for formal, public and orderly communication. By formal we mean that papers which have appeared in journals can be cited and retrieved unambiguously. By public we mean that journals are available to anyone in libraries or by subscription, and anyone can submit a paper. By orderly we mean that the inputs are accepted or rejected by the scientific community itself on the basis of merit.

An increasing number of journals is now appearing in the area, and for some years the birth rate has exceeded the mortality rate. This increase is however difficult to determine with any degree of certainty. Few lists of what is being published in the Arab World are available, and even these are out of date .

Thus the lack of comprehensive coverage of all published journals is in itself a major inadequacy. The only listing which appears as part of the National Bibliography is that published by Iraq[24]. Little has been done in the region to improve the quality control of published information, to promote the collaboration between editors and publishers of journals. However, the editorial board of the Bulletin of the College of Soience, the University of Baghdad, very recently convened a meeting[8] - which happens to be the only meeting of its kind - to discuss scientific publishing. This is an area which needs a thorough study and detailed investigation on a regional bases.

Activities should be organized to improve the quality control of published information, to promote collaboration between editors and publishers of journals, to provide guidance and training for editing to deal with different types of publications, organization of primary and secondary journals preparation of manuscripts etc.

2.5. WRITING FOR THE LAYMAN

If the results of research are to be made available and known effectively, much thought will have to be given to new and improved methods of dissemination. The very style in which the scientific paper is written is slightly frightening to non-scientific people. The technique of writing selectively for particular kinds of reader is not yet completely evolved but its possibilities in our region are so great as to demand urgent action. A writer to be effective, must know something of the

thoughts and habits of the people he is writing for, and its of interest to note that one of the important changes has been the increasing number of new journals in which commendable efforts are made to popularize scientific information in a form suitable for the educated layman.

2.6. LIBRARIES

2.6.1. Library Development

It has always been the case in the region for the government to take the responsibility of establishing such physical information resources such as libraries and archives services, investing more and more money and personnel in developing national, school, public, university and special libraries. These institutions continue to play a variety of roles in the area depending on individual environments and circumstances. A number of articles, surveys and outcome of expert meetings - though not suggesting so high a percentage - together provide an assessment of the over-all library-complex demonstrating their activities in relation to the environment that shaped them, supports their operation and uses their services[2,3,5,7,6,9,10,20,21,25]
These should make it possible to gain a better understanding of the situation of libraries in the area.

A study[17] of the library system in Iraq reports that the completely independent nature of the libraries makes it possible to speak of a library system. The Central University Library, for example, is only central in a symbolic sense. This is also the case among the libraries of the Research Centres. There is

as yet, no overall plan to develop an integrated system of libraries: a state of affairs that is not explicit to Iraq, but it represents a general trend in the region, especially in countries where there is a host of such physical institutions.

The functions normally associated with a national library are being performed by other types of libraries. In the case of public libraries, their role in cultural development is not very clear every where, and the problem of relating them to the cultural background and needs of the community, especially in societies with a high level of illiteracy, is a very serious one.

2.6.2. Standardization For Library Services

National bibliographic control is not generally practiced, and when applied has not yet reached the required comprehensiveness. This might be due to the lack of legeslative action in some cases, and the need for provision for the drafting and adoption of additional legislation required in others. This is a specific case of a more general picture denoting the absence of standards for library activities. Whilst in some cases standards might have to be modified to meet local conditions, yet there are many library operations to which common standards could be applied on an international scale.

To recaptulate, one would say that at a time when everyone is facing increasing difficulties in coping with the existing information resources, the libraries - of the region under consideration - whose function it is to order and to process the available materials live in a state of crisis far from being the ideal state.

2.7. OTHER INFORMATION SERVICES

In the previous section the situation concerning libraries was discussed. However, libraries form one type of the physical information resources which besides cover documentation centres, information analysis centres, data banks, and so on.

In addition publication in primary sources of information no longer completes the job of making results available, as a result of the increasing size of information and the variety of means and purposes of its communication. Its consolidation and condensation for use is essential to effective diffusion as is initial publication. This is achieved through critical review and evaluation, announcement, awareness, and access services, and storage in computer-managed structures providing for search, retrieval and selective dissemination.

The accelerating developments have made it imperative for Arab States to make co-operative endeavours to build institutions for absorption and dissemination of technologies on the regional level.

2.7.1. Industrial Development Centre for Arab States (IDCAS)

At the initiative and support of IDCAS and the United Nations Industrial Development Organization (UNIDO) a number of specialized institutes of technology are being set up in different Arab States so as to develop a technological information grid to serve the Arab industries. The institutes and the countries where they are established or to be established are as follows:

Engineering/Iraq; Building Materials/Jordan; Food Technology/ Sudan; Fertilizer/Lebanon; Petrochemicals/Syria; Management and Productivity/Libya; Small Scale Industries/Egypt; Textile Industry/Egypt; Iron, Steel Foundry/Algeria. One of the main objectives of these institutes is providing the industries with documentation and information services. Taking the Specialized Institute for Engineering Industries, Iraq as an example, one can follow the establishment of the institute by a decision taken by the Iraqi Planning Board in 1971. The Republic of Iraq promulgated the law no 128 of 1972 setting up the Institute a detailed account of its activities was given by Al-Rawi [1]. Briefly the system comprises: Library; Documentation services; Engineering information bulletin; Reprographic facilities; Technical Enquiry and referral service; and Bibliographic services. Some of the services planned for introduction gradually cover: current contents in engineering; engineering abstracts; product information; translation; selective dissemination of information.

2.7.2. Arab League Educational, Cultural and Scientific Organization (ALECSO)

ALECSO is a specialized agency of the League of Arab States with the objective of developing co-operation in the Arab World in the fields of education, culture and science. The Department of Documentation and Information provides services through gathering and processing documents; preparing material for basic research; and assisting Arab countries in developing library and documentation services.

- to classify and index scientific books, mongraphs reports, etc. collected by the centre,
- to provide reading room facilities for the users and to develop a collection of bibliographic and reference works,
- to translate works from less common languages into languages known to the researchers,
- to schedule, prepare, and participate in national and international meetings and conferences,
- to train the staff members needed for the centre and other libraries,
- to establish a reprography and printing unit which can meet the needs of the centre.

2.7.4. Documentation in Jordan

Taking another country, Jordan, we find that a survey of the present situation in the documentation and library fields has been carried out during May 1976 by a Unesco Consultant [31]. The role and needs of the proposed national documentation Centre were analysed, with a view to its establishment and development. It is felt that it would be the centre's role to contribute to the establishment of a planned network of public libraries. Further information concerning some individual documentation and information centres or services of the region is to be found in the literature as part of general surveys, guides and directories. [19,30,29,28,31] directories.

2.8. HUMAN RESOURCES

An adequate supply of qualified staff is essential for the success of any programme. Countries of the region have a direct and obvious interest in ensuring that there is an adequare supply of qualified staff to support library services and programmes. An examination of available training facilities does emphasize the need to establish schools with curricula conforming to basic international standards as a part of the regular educational structure. It is clear that the region suffers from a dreath of professional people in the field of information: librarians and documentalists; editors, writers, journalists, analysts, reprographers and a host of others able to make use of computer techniques for information storage and retrieval. The interdisplinary nature of information makes it difficult to locate suitable people. There is thus a general problem of pre-service training and in-service training for those who handle information.[32] This need has been emphasized in a recent expert meeting[36] and is covered by recommendations 17 to 21 of the final report.

2.9. SERVICE ESTABLISHMENT: ENCOUNTERED PROBLEMS

In setting up documentary and bibliographic services, certain problems and difficulties arise. These may be considered as acquisition and processing problems.

2.9.1. Acquisition Problems

Many of those connected with the collection of publications have been identified and solved with varying degrees of success. A documentation centre must grow around a library as nucleus. The problems and difficulties that arise in this regard are as follows:

a) The VOLUME and VARIETY of publications is vast. To collect all is almost impossible. The physical handling of a project of such magnitude is therefore an expensive proposition. Mechanical means of handling and reproduction has therefore been utilized to tackle this difficulty.

b) The COST of PUBLICATIONS is high if each centre is to collect everything. Suggestions have been made that certain centres should concentrate on certain fields of studies and research so as to minimize cost and avoid unnecessary duplication. Exchange of publications can also be arranged so as to minimize currency restrictions.

c) The PROBLEM of DUPLICATION deserves mention in its own right apart from the financial wastage involved. A centralized documentation service with an adequate communication system is most valuable. A decentralized system has also its own advantages. A reasonable mean must be maintained between both.

d) An adequate GEOGRAPHICAL COVERAGE of publications from different countries is absolutely essential. To achieve this, a viable international network of exchange must be

established. Through this machinery all forms of publications can be exchanged.

2.9.2. Processing Problems

A group of problems surround the processing of materials collected and their proper storage. It would seem that the key problems in this area are:

a) Library Development and Bibliographic Techniques - Libraries development and bibliographic experience play a key role in the establishment of a documentation centre. The classification and cataloguing of material obtained can only be handled by men trained in the techniques involved.

b) Trained Personnel - Owing to the scarcity of personnel with bibliographical training, training facilities will have to be arranged, for without librarians and documentalists no library or documentation centre can flourish.

c) Language and Terminology - In order to deal with the masses of publications, language experts will have to be engaged for translation and abstracting service. Languages not rich in scientific literature face problems of scientific terminology. It must be realized however that science and technology are international disciplines and their communications must have universal connotation.

d) Mechanical Equipments - Increasing use of mechanical equipment is obligatory owing to the volume of materials to be dealt

with. These equipments include card-indexes suitable for mechanical sorting devices like IBM machinery, photo-reproduction equipments like photocopying or microfilm, microreading equipments, electric typewriters, addressographs, letterpress, offset printing machines. At a later stage the use of electronic storage and retrieval machines may be introduced. Trained personnel are needed for operating these mechanical devices.

From the previous discussion examining the situation of dissemination of information in the region, one is immediately struck by the variety of totally independent arrangements, which attest to the lack of systematic and co-ordinated attempts to solve a problem that is of common concern.

It is to be noted that the area is in the midest of a situation where the financial support to the services i.e. the information agencies budgets tend to grow far more slowly than the costs of meeting growing users needs, and of acquiring, processing, and storing increasing quantities of information materials.

The need for information has been generally accepted, especially by governments and by the community of users.

The problem of creating awarness of the need for and the decisive role played by information is not in fact acute as it might seem. Conferences and meetings at ministerial levels as well as those of experts and consultants have always stressed the importance of information as a means of keeping in touch with developments in the field of knowledge and of its role in the

economic and social development of their countries 11,22,27,38
However, the support needed to achieve some measure of co-ordinated actions establishing an information policy and infrastructure falls far from the strong words of the many recommendations highlightening such meetings.

3. DOCUMENTATION AND INFORMATION SYSTEMS: OBJECTIVES FOR ACTION

Today in the region information services exhibit the characteristic heterogeneity that evolved by fits and starts through some adaptations to locally perceived needs. No national plan prepared by experts - and naturally no regional plans either - guided its evolution. Instead, decisions have been made, and are still being made at numerous points independently and under unstructured co-ordination.

It is only natural under such circumstances that our objectives should be formulated to take care of all the points raised in the outline given before describing the current state of development in the region as well as the various comments put forward therein.

However, it should be pointed that two areas urgently need definite studies, and these are considered at first.

3.1 USERS STUDIES

Our knowledge of information requirements is still extremely small. It is generally based on only partial evidence

rather than firm conclusions. The paucity of user studies is of itself interesting, and suggests at the face of things that the problems are not very severe or that users have not been very demanding. One might conclude that the users have not in general been very articulate about their needs.

Here, I would like to emphasize a point namely, that information needs are not identical with information uses or demands. Individuals do not use all they demand, partly because they are not always able to obtain it or partly because it may not be relevant when they do obtain it. They also do not demand all they need; mainly because they are often unaware of potentially relevant information. Nor do people necessarily need all they demand, or even perhaps all they use. Most studies of information needs have actually been studies of uses, or at best of demands. The identification of needs is in fact extremely difficult because it involves the articulation of something that the user is unable to articulate for himself. The study of user demands and uses alone are definately of great value, but we cannot ignore that there may be large numbers of unidentified needs which ought to be satisfied. Thus, a detailed analysis should be made of the information needs of the various groups of users to ensure that any action should actually meet these needs.

3.2. COST AND VALUE STUDIES

Problems of financing centres to provide information (e.g. libraries, archives, documentation centres etc.) have not

yet been analysed - in the region - in economic terms. Although the establishment and development of such services are viewed as the responsibility of the state both at national and international level, yet after all the goal of such centres is to deliver a specialized service to an interested segment of the general population; but to be able to do so, first they must be able to survive.

Accepting the concept that the information process is part of the study, investigation or research project or task, implies that the various links of the information transfer chain should be supported more or less directly by project funds, i.e. it should be included in the original budget of the project.

Information centres are entitled to recover some of their expenses, even though in principle they should be supported primarily by the state. They must be ready to justify their fiscal existence, which calls for the present trend toward cost recovery.

The difficulty of developing quantitative measures of the value of information services, suggests the need for conducting cost and value study on the existing services. Information has a cost for the seller and a value for the buyer. Needed measures[23] should include the value of the time devoted to actively seeking information and of the waiting time before it is received. Collections of opinions of users of such services is of little utility. Often such off hand opinions call for an

exhaustive service when a less comprehensive one would be more valuable, or for an exceedingly fast service when a slower one would be all that is actually needed. Such studies will no doubt provide a better foundation for monitoring the performance of services on terms of effectiveness rather than appearance or sophistication.

The evaluation should be based, among other factors, on the saving of money that would be unnecessarily spent because of the ignorance of the availability of the data. Other potential criteria are the cost of making the search, the rate of usage of the centre, and the growth rate of satisfied customers.

In the remainder of this presentation, the current thinking concerning the information problem in the region is briefly reviewed, giving further proposals for a new environment for the future information.

3.3. A NATIONAL INFORMATION POLICY

The most obvious approach to the national problem is an integrated plan of national documentation, library and archives infrastructure. This advocates establishing a strong national information policy, on the basis of which a national plan for the well-balanced development of the infrastructure can be drawn up and implemented. The elements of such a plan should be fully incorporated in the national development plan.

The UNISIST document "Information Policy Objectives" provides a common general framework and an opportunity to indicate

the elements to be considered in planning a national information system: how to start from the "needs", to drive the "functions", before proceeding toward the "structure" which lead to the need for a national information policy, mode of formulation and timing and integration with other national policy decisions.

This naturally leads to the establishment of the appropriate national organs with clearly designated powers and responsibilities for the detailed study of all problems involved and the elaboration of plans within the national frame work. The National Information Systems NATIS Document [26] "Objectives for National and International Action" provides a framework to exchange views on the co-ordinated planning of such services and recommends guidelines for their creation and development.

3.4. ANALYSIS OF EXISTING INFORMATION RESOURCES

The approach to review and assess the existing information and documentation facilities and requirements through preparation of national inventories is an essential prerequisite of any sound planning that should be used as a basis for forcasting future needs. This should cover national manpower resources, and programmes for the education and training of information specialists.

3.5. TECHNOLOGY AND THE SERVICES

In so far as the systematic analysis of a nation's requirements reveals the need to use modern technology, the plan should draw up an inventory of the technical requirements and

resources which would make it possible to speed up the handling of information as long as the technological environment in the country is ready for them. In introducing technology, special attention should be paid to compatibility, standardization and system performance and analysis.

3.6. INTERNATIONAL CO-OPERATION

Knowledge has little to do with national boundaries, and as the rapid expansion of knowledge demands more extensive services, the waste entailed when each nation provides a complete set of services for itself becomes more and more inexcusable. The need for co-operative efforts of regional and international scope is apparent.

Many of the problems encountered in information transfer cut across several sectors and require co-operative approach. These problems clearly go far beyond national frontiers and can only be solved in the widest possible international context. For this reason encouragement should be given to measures aimed at greater co-operation which are taken by international bodies. Harmonization of policies of member countries of the region does not preclude the possibility of wider harmonization within the frame-work of international organisations. On the other hand international co-operation for information transfer in all fields, is indeed an essential aspect of national development for which international information systems are proving to be one of the most fruitful approaches.

It is in this atmosphere that a family of compatible international information systems are either operational, under development, or planned at the present time. Knowing that there are at least thirty five specialized global information systems developing within the UNISIST conceptual frame-work endorsed by the United Nations system, and the limit imposed on the length of the presentation, it is at least appropriate to give sample presentation of such systems.

3.7. UNISIST PROGRAMME

This is an international effort to synthesize a diversity of philosophies, programmes and policies that relate to the free flow or scientific and technical information. It is a programme based on a joint Unesco/ICSU Study whose aims are to co-ordinate existing trends towards international co-operation.

Although initial programme activities emphasized information transfer in the natural sciences and technology, attention has been given from the inception of the programme to ensuring the appropriateness of the UNISIST frame-work to the social sciences. Originally identified with the Unesco Science Sector, UNISIST has been implemented since January 1977 within the intersectoral Unesco General Information Programme.

The programme comprises five main objectives which are summed under the following headings:

1) Improving tools of systems interconnection;
2) Strengthening the institutional components of the information transfer chain;

3) Developing specialised information manpower;

4) Developing science information policies and national net works; and

5) Special assistance to developing countries.

Under each heading, guidance is available for development of global and regional information networks and to Member States to strengthen their national capabilities to profit from international information exchange.

As all other intergovernmental programmes of Unesco in the Sciences, UNISIST uses the device of Steering Committee with Member States representation to guide their progress.

To assess periodically the ability of the UNISIST programme to meet the changing requirements and trends of the world's community and to evaluate the relevance and adequacy of the programme, a UNISIST Advisory Committee is established representing the interests of producers, handlers and users of scientific and technological information. It reports to the Director General.

Several international operational information systems (e.g. INIS, AGRIS, SPINES, DEVSIS) have been declared as being or are being developed within the frame-work of UNISIST principles, standard and guidelines.

3.7.1. Priorities of UNISIST

The Intergovernmental Conference for the Establishment of a World Science Information System (UNISIST) of 1971 recommended

the programme objective no. I was the most urgent. Many delegations considered that Programme objective no. IV, dealing with policy matters was of considerable importance[35]. The General Conference at its 17th Session approved these prioreties[33]. Finally the General Conference at its 18th Session decided that the priority activities as previously established will be maintained, bearing in mind at the same time that many problems in information transfer and policy, including legal and economic problems are of special importance to certain Member States[34].

3.8. THE PROPOSAL DEVSIS

The need for better information support to development decision-making has been recognized for some time. An international symposium held in Berlin in 1969 had this as its main recommendation[16]. At about the same time, Sir Robert Jackson identified this need as an important recommendation for better functioning of the United Nations own development programmes[18]. This lead the United Nations to creat its Inter-Organizational Board for Information Systems and Related Activities (IOB). This has recently received a mandate to build a system that will handle information about development projects[37].

Believing that there is a very real need for a co-operative system to handle the development literature, the International Development Centre (IDRC) circulated a paper in January 1974 which proposed the establishment of a system patterned on the models of INIS and Agris .

A meeting was convened in Ottawa in June 1974 co-sponsored by OECD and Unesco and attended by representatives of national regional and international organizations. The meeting called for further study of the need for the establishment of an international information system in the field of economic and social development, at present known as DEVSIS, and the elaboration of a proposal to be submitted to appropriate bodies of the United Nations. A series of recommendations and specific proposals for the pursuit and the follow-up of this initiative were formulated to ensure that it will be of the most effective possible use to planners and policy makers in developing countries, taking full account of the existing information infrastructure in the Third World [12]. The concept of DEVSIS is as a decentralized mission-oriented system. This is the only means by which costs can be kept to a minimum and shared equitably among participating countries; delays in identifying and reporting literature can be reduced and duplication can be avoided by the application of a territorial formula. It is in the national interest to control national production of literature; there is an extra motivation if, in return for the national file, the country receives a global file. The national file represents national policy since it is the sovereign right of each participant to decide what is included in its input to the system.

Work is underway to refine the subject scope, to estimate quantities of literature, to define the record structure of DEVSIS and to develop appropriate indexing parameters. DEVSIS

will consist of two files: a bibliographic file (File One) built according to teritorial formula, and a referral file (File Two) to be developed by the DEVSIS Central Unit. Only information about developing countries, or the relationships between developing and developed countries, will be included in the bibliographic file for DEVSIS.

As development information is often courty-specific or region-specific, and to make the information contained in DEVSIS readily accessible to those who need it most it is recommended that DEVSIS be implemented with three carrier languages, English, French and Spanish, the adoption of Arabic as a fourth carrier language is to be considered when the required technology is available. This newly proposed system co-sponsored by the International Development Research Centre (IDRC), the International Labour Office (ILO), the United Nations Development Programme (UNDP), the Organization for Economic Co-operation and Development (OECD) and Unesco and at present under design is likely to be of considerable future importance[13].

3.9. REGIONAL INFORMATION NETWORKS

Global information systems such as those developing within the United Nations system provide equal access by all member countries. The regional approach permits pooling resources for more rapid build-up of network capabilities within a given region. This might become a valuable link for international information exchange, AGRIS being a very good example.

The Economic Commissions of the United Nation . are developing such systems. The CLADES Documentation Centre of ECLA set up in 1971, and the Asian Development Institute Sponsored by ESCAP are developing the basis for co-operation in their respective regions. Both regional networks are conceived so as to be ultimately integrated into the DEVSIS system if it indeed becomes a reality.

It goes without saying that the co-ordination of information flow at the national level is of primal importance both in national development and in regional and international information exchange. It is for this reason that we should stress the concept that information activities should be designed and operated as individual and somewhat independent parts of a comprehensive network. It is vitally important that continued efforts towards effective co-ordination and voluntary co-operation on all levels - national, regional and international - be vigorously fostered.

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