Scientific Information for Developing Countries

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Information is one of the basic commodities of our civilisation. Current and relevant information concerning any problem is essential for decision-makers for action in any field. The total exchange of information includes cultural, economic, scientific and technical components. In our increasingly technically-based civilisation, Scientific and Technical Information (STI) is a key element for progress and development.

STI in its widest sense can be defined as "information on the status, progress and results of research development and other scientific activity, and on the application of such results, together with any other information of potential use in any scientific or technological activity."

It is a recognised fact that national economies are dependant to an ever-increasing extent on the application of scientific and technical knowledge. Therefore, the system by which STI is disseminated in a country plays a significant role in furthering growth processes. STI, as a major resource should be given the same importance as other factors in the economic growth of a nation. For rapid development, information on relevant research and technologies should be readily available to research and development personnel, scientists, technologists, industrialists and administrators. Developing countries are constantly urged to channel more of their resources into increasing the output of scientific research. But, it is just as important to utilize financial resources on the **maximum utilisation of existing STI,** as it is to spend on further research.

Some countries notably the developed countries have realised this fact and have taken steps to improve the handling and dissemination of information. New and more sophisticated techniques and methods of librarianship, bibliography, retrieval of material, reproduction, and computerized on-line databases have been developed to provide immediate search capability. Although STI is an international resource, the existing worldwide scientific information systems have thus evolved in such a way that the greatest benefits are to the more advanced countires. The less developed nations which require STI most for furthering growth processes are therefore placed at a disadvantage. Instead of a free flow of organised information from the affluent to the developing countries, an 'information gap' has thus been created. The gap between a developing country and the more developed world is increased by its inability to cultivate an awareness of current ideas, techniques, materials and methods, and to its failure to introduce them quickly and effectively into operation.

One of the main problems of information specialists the world over is the ever-increasing speed with which information (especially STI) is being generated. The rate at which STI is produced today is so great that according to De Solla Price "Any young scientist standing now and looking back at the end of his career upon a normal life span will find that 80 to 90 per cent of all the scientific work achieved by the end of his period will have taken place before his very eyes and that only 10 to 20 per cent will antedate his experience."[1] It is estimated that at present some 2 million documents and articles, 50,000 journals and over 30,000 books on science and technology are published yearly.

The exponential growth of science literature is illustrated by the fact that Chemical Abstracts in 1930 contained 54,000 abstracts and in 1962 some 165,000. The number increased to over 200,000 by 1970. One of the reasons for the flood of literature is that the results of scientific research are published not only for the communication of information but also for priority and prestige reasons. This situation has made it impossible for any individual to scan and remember all of the literature that has a reasonable probability of being of use later.

The generators of information are mainly the developed countries. This flood of data creates problems relating to assembling, storage retrieval and dissemination to make it available to the user. The 'information explosion' has grown to such phenomenal proportions that it cannot be handled by conventional libraries and other agencies. New methods and technologies have evolved such as on-line data processing by computer for the rapid transmission of information.

'The computer is seen as the only method of coping with the continued expansion of knowledge: there are, for instance, over 400 new chemical compounds reported in the literature every working day'.[2] Developing countries are dependant for much of their requirements of STI. However, much of the modern technology needed for establishing computerized services is either too expensive or does not meet the requirements of the less developed nations. Thus, these countries lacking modern technology are faced with the economic impossibility of individuals or organisations retrieving current and relevant literature on any topic.

Together with the problems caused by the information explosion is the growing isolation of users and seekers of information in the developing countries. Personnal contact between scientists at conferences and other formal and informal gatherings plays a significant role in the dissemination of STI. Inadequate

financial resources to attend regional and international conferences deprive our scientists of this avenue of obtaining current information.

The problems confronting developing countries in obtaining necessary STI, therefore are due to a variety of causes. The flow of information from generator to user too, is hindered in many developing countries. The reason for this bottleneck is that the existing information handling systems such as libraries and documentation centres are often dispersed and poorly coordinated. Lack of trained and specialized manpower, technical knowhow and equipment are major setbacks. Raising the level of education in the field of informatics and the transfer of information technology are dependant on the available, often meagre, financial resources. Direct transplantation of information technology from the advanced countries is also not advisable when the infrastructure of the existing information system is unable to assimilate and maintain them.

In recent years, the problems confronting developing countries in obtaining necessary STI has attracted the attention of international organizations, both governmental and non-governmental. The National Technical Information Service (NTIS) was formed by the U.S.Government to disseminate STI to less developed countries. The NTIS has a large range of secondary abstracting and indexing services orientated towards national and international development. Although the NTIS is principally in the American region, it has also been extended to the African and Asian Regions.

In 1967, UNESCO and ICSU (International Council of Scientific Unions) undertook a joint study to resolve these problems and consequently in October 1971 the UNISIST programme was launched by the UNESCO member states. The UNISIST Report (1973) states that 'The developing countries need coordinated international assistance to develop their national information systems, in a compatible fashion, to train their information specialists, teachers and managers, and to seek and adapt new communication and information handling techniques to their specific needs'.

One of the main functions of the UNISIST programme is to stimulate information flow particularly to the benefit of the developing countries. The programme does not directly provide STI to users but acts as a catalyst on the development of information systems and by technical and financial assistance projects. The activities of UNISIST help countries to establish their own information infrastructures through developing information systems and databanks and through the use of modern techniques. The need for a high-level national focus to coordinate information activities both on a national and international scale was established by UNISIST. The lack of a coordinating focus for STI within any country leads to the development of mutually incompatible and heterogeneous internal information systems and to wasteful duplication of resources. It also leads to delayed application of the results of research and causes serious information gaps between countries.

Some countries already have a national focus for STI while others are moving towards the establishment of one. The government of India recognising the need for a planned integrated information system established the National Information System for Science and Technology (NISSAT). NISSAT coordinates information facilities available in the country at regional and at sectoral level (Agriculture, Industry, etc.).

UNESCO sponsored a consultancy mission to Sri Lanka in 1968 to advise on the establishment of a national scientific documentation centre. The report on this mission stated that 'in respect of STI the analysis of the resources of existing libraries in the country and the possibilities for their further development towards filling the needs of the future, has indicated the urgent necessity for rapid development in this field if industrial and agricultural development is not to be seriously hampered'.

The Cabinet in 1969 approved the proposal of this mission to establish such a centre and the National Science Council of Sri Lanka was nominated as the national focal point for scientific information activity. Within the National Science Council, the Sri Lanka Scientific and Technical Information Centre (SLSTIC) was established to serve as a clearing-house for STI and to coordinate information activities among the national Scientific and Technical libraries.

Considering the problems existing in developing countries to obtain STI: the ever-increasing flood of scientific literature in an increasing number of languages, the lack of trained documentalists and other personnel, poor coordination and disorganization in existing facilities, limited resources and the lack of information technology, the establishment of a national information centre is a difficult but all important undertaking. According to UNESCO "there is no doubt that there is a relationship between the possession of current scientific information and economic progress. Although no systematic evaluation or study of the pay-off from information systems has yet been made, it is accepted that technological change is observed to occur in information rich areas. This change brings to those that effect it, greater productivity per man hour expended and a more stimulating working environment that induces more change."3

References:

1. D. J. De Solla Price, (1963) *Little science, big science.* Columbia University Press. p. 2.

2. Denis Grogan (1976). *Science and Technology. An introduction to the literature.* Clive Bingley. London. p. 192.

3. Unesco (1969) 1159/BMS. RD/DBA.