II G. TECHNOLOGY INFORMATION & FACILITATION PROGRAMME

1.   INTRODUCTION

Technology Information and Facilitation Programme (TIP) is one of the components of 'Technology Promotion, Development and Utilization (TPDU) Programme'. The broad objective of the programme is to generate endogenous capacities for the development and utilization of digital information resources for providing inputs to S&T research

In today's scenario, given the quality of connectivity, it is being strongly felt that the Programme should endeavour to facilitate strengthening the resource base of information available and provide a mechanism for optimal utilization of the resources in the country. TIP would also facilitate collaborative research among industries and institutions.

Information and Communication Technologies (ICT) are now internalized to the socio-economic fabric of the country. These all-pervasive technologies can be fruitfully applied to all sectors of the economy, and the community of the scientific & industrial research workers could be one of the major beneficiaries.

In the recent past public and private sector companies have made significant investments to develop infrastructural facilities like telecom networks. The moot question here is how best such an infrastructure could be utilized for "scientific & industrial research" and how the new ICT tools are to be used in diverse domains in the Indian environment.

The scheme is proposed to be implemented as a co-operative and collaborative venture and built around the existing infrastructure, wherever possible. Thus the strategy would be to:

- Concentrate on facilitation of Indian content on S&T

- Avoid duplication of efforts
- Minimum overlapping
- Maximum utilization of existing facilities
- Utilize internet technology

2.   OBJECTIVES

The specific objectives are designed to:

- Develop appropriate endogenous information capacities to support R&D activities

- Support the production of local content and to promote capturing of indigenous knowledge base

- Promote information and knowledge networking at local, regional and national levels to facilitate flow and sharing of information resources

- Map the national S&T productivity in relation to the international S&T Productivity

- Support education, training and R&D in digital content development and utilization

- Promote national and international cooperation in related areas

3.   COMPONENTS

The specific components of the scheme are:

3.1   Development of endogenous capacities

Promotion of content development

India has a huge population of domain experts most of whom are also proficient in English Language and therefore they can cater to international demands. The latest potential of content development is yet to manifest in India. Besides, there is a huge and hitherto unsatisfied demand of contents in Indian

languages. It is therefore, proposed to concentrate on capacity building in digital content development with special emphasis on items of S&T interest. Following activities are inter-alia contemplated during the plan period:

- Organization of intensive training courses on technical aspects of content development, entrepreneurship, information marketing, and so on for students, housewives and retired specialists and such players.

- To experiment with technologies for content development in Indian languages

- Research on methodologies for content development

- Assessment of subject areas of priority

Universal Access to information

Access to the libraries being maintained by many of the scientific institutions and organizations is restricted to the researchers and staff of respective institutions. It is therefore essential to develop a mechanism to facilitate the access of these valuable assets to all potential users.

3.2 Development of local content and indigenous knowledge base

National websites/ Servers

Commercial dotcom enterprises may not under take collection, collation and hosting of nationally generated contents on science and technology because the exercise is not attractive. The responsibility of developing such sites therefore falls on public programmes like the TIP.

Indian Digital Library of Theses and R&D Publications

One of the recommendations of the IT Action plan prepared by the National Task Force on IT & Software Development was to host in the cyber space dissertations/ theses submitted for degrees. The focus would be on capturing full-text information of dissertations rather than restricting only to bibliographic details.

Efforts also have to be made to establish a suitable mechanism for collection, compilation and publication (hosting) of reports generated out of R&D activities funded by Government and its agencies for wider dissemination through electronic media.

Documentation of traditional knowledge and Folk Wisdom

Significant efforts are already underway in several institutions to capture the essence of the documented traditional knowledge. It is proposed to concentrate on tacit knowledge base of oral tradition and folk wisdom. Such knowledge is usually not documented and remains confined within families or communities. Such knowledge base is to be explored systematically and organized into databases.

3.3 Information for Community – Digital Provide & Opportunities

The diffusion of ICT has so far been uneven. Sporadic experimental efforts are being made by various central and state government agencies and NGOs to harness the ICT for community good. On this subject, the concentration of the component scheme would be primarily on the following:

- Systematic documentation of efforts/ experiments for bridging the digital divide

- Identification of best practices and lessons after analysis of various efforts/ experiments

Experimentation with various modes of contents for information kiosks in schools, colleges, universities and other educational institutions, R&D institutions, medical institutions and so on will be undertaken.

3.4 Knowledge Net

Promotion of Information Access and Sharing

A number of scientific institutions in the country have been engaged in the development of databases on their subject domains. Similarly, several scientific libraries in the country possess invaluable collection of scientific materials. These resources need to be organized and sharing mechanisms introduced. On this subject, the concentration would be primarily on the following:

- Assessment of subject areas of priority
- To adopt subjects of national interest and also those with international relevance for development of contents for dissemination through Internet

Virtual Systems

The concept of virtual information systems can be applied to a variety of situations in R&D and academics. It could be a knowledge network, connecting the information resource base of a set of institutions. The products and services could be shared by participating institutions and also those not contributing to the system. It could be a virtual laboratory through networking of several specialized laboratories. Similarly, there could be virtual teaching facilities.

Electronic publishing of selected Indian S&T materials

Indian journals, barring few exceptions, suffer from poor visibility and readership. This malady is a disincentive to Indian S&T workers to publish their significant contributions in Indian journals. The publishers also face problems in making upfront investments on printing, despatch and storage of back runs. Electronic publishing can help improving the situation. The following activities are contemplated.

- Publish selected Indian journal on CD-Rom and make a worldwide pitch to market them.
- Create a website to host electronic version of selected journals and the back issues of journals with high impact factor.

3.5 Open Archives initiative: An alternative to Scholarly Communication

There has been a growing realization that with the growth of internet use, the printed journals may no more be able to survive as a primary means of scholarly communication. The electronic medium offers faster, wider and cheaper means of communication as compared to the printed medium. It is proposed to support Open Archive Initiative of journal articles published in India. Academic and Research Institutions would be encouraged to set up institutional or national open archives in particular disciplines – covering disciplines in which India has strength like mathematics and statistics, geo-science, etc.

3.6 Mapping of National S&T productivity

The health of Indian science will be regularly studied through the National Mapping of Science programme. Use of Scientometric techniques for application on patent

information will be explored. Efforts will be made to develop new techniques and tools of analysis. In order to give a fillip to the programme, it is proposed to establish a common facility for Scientometric studies. The full potential of Scientometrics remains to be realized in India. The National Scientometric Facility may subscribe to the data sets and required hardware and software for analysis. Standardization of data elements, synthesis of results from different databases, training and other such activities of integration and accumulation can then be taken up on a cost-effective basis.

The skill base hitherto limited will be enhanced through elaborate manpower development programme.

3.7 Education, training and R&D.

Surveys and R&D studies

It is necessary to undertake studies and surveys to identify user needs, assess new technologies, and to develop new tools and techniques. In addition, it is also necessary to take up sector specific studies to assess the implications and impact of IT and media convergence. Such studies would help to evolve policy parameters to assess the sectoral implications of ICT, evolve new indicators to measure the changes, to explore new opportunities and so on.

Education & Training

The Human Resources Development activities would target two sets of professionals – information users, and information managers/ handlers. Through the MPD programme, it is intended to raise the intellectual skills of knowledge workers to a level at which the beneficiaries would be effective at their own initiative. In order to raise the skills, it is proposed to take up both formal and informal programmes on the following lines.

- Promote skill development of information practitioners and subject specialists in new information resources and use of tools for knowledge management.

- Annual national conference to facilitate interaction among information service providers, information users and information industry. Organize a series of annual international workshop on IT and exploitation of S&T information resources in developing countries.

- Establish a regular and long-term training facilities on Knowledge Management in national institutions to provide quality education to student in preparing them to take up jobs such as digital librarians, content managers, information economists, human-computer interface specialists, etc.

- Undertake User Education on various sources of information for practicing S&T workers

- Publish an information bulletin to disseminate information on new technologies, research results, etc.

3.8 International Activities

It is necessary to maintain the tempo of interaction with the activities of APIN/UNESCO (Asian Pacific Information Network). Various possibilities of bilateral cooperation especially on information technology application and information exchange and the possibilities of sharing knowledge with participants/ users of SAARC, Southeast Asian and other English speaking developing countries, will be explored. Besides, the use of freeware like CDS/ISIS for bibliographic applications, IDAMS for statistical applications, and Greenstone for digital document management will be promoted.

4. ACTIVITIES DURING THE YEAR

4.1 Expert Meet/ Brain storming Sessions

In order to achieve the objectives of the programme, a series of steps/ activities including consultations with experts, industry representatives and users of information has been planned. In this connection, four brain-storming sessions at Pune, Bhubaneswar, Chandigrah and Hyderabad were held. Experts from industries and R&D institutions participated in the meeting.

The primary objective of brain-storming sessions/ expert meets was to identify the requirements for the industry, prioritize them to formulate specific projects for the cause of promotion and development of information resource base, use and access to facilitate industrial R&D. These meetings provided useful suggestions about the priority areas and institutions for further works.

4.2 On-Going Projects

Scouting for grass-root level innovations, compilation and dissemination of information in local languages across India

Our country presents a rich fabric of innovative activities. While the innovative activities of established institutions are visible and receive attention, a vast reservoir of innovations by our farmers, artisans and tribals have often remained outside our consideration and appreciation. A project was initiated for a Knowledge Network using local language electronic database of Honey Bee network's green grassroots innovations. The project would collect, document and digitize innovations and examples of outstanding traditional knowledge mainly from rural areas, organize these in a multimedia database, translate the information in local languages

and establish a mechanism for dissemination and sharing of information on innovations.

National Websites on S&T subjects

It is essential to develop endogenous capabilities for content development which has high potential in India in view of large S&T population having domain expertise, IT expertise and English proficiency. DSIR has been aggressively nurturing various possibilities. Besides in pursuance of the recommendations of the Task Force on Information Technology, several National websites are being created for national and international access. Few examples are given below:

- Intellectual Property Rights
  (*http://www.iprlawindia.org*)
- Intellectual resources in Eastern India
  (*http://www.calibnet.org*)
- Food Science & Technology
  (*http://www.mylibnet.org*)
- Indian Tea
  (*http://www.upasitearesearch.org,
  http://dtrdc.org)*
- Expert Database in Science & Technology
  (*http://nissat.inflibnet.ac.in*)
- E-Journals at Indian National Science Academy (*http://www.insa.ac.in*)
- Virtual information Centre
  (*http://www.vic-ikp.info*)
- Portal on Science and Technology
  (*http://www.anusandhan.net*)

Post Graduate course on Information and Knowledge Management

Information collection, collation, consolidation, packaging etc is getting more and more difficult due to proliferation of information sources and ever-developing tools and techniques for information handling. The user's demands have also matured. Besides,

the institutions and corporates are in dire need to systematically capture, package and share "in-house" information and experiences (Tacit knowledge) to subsist in this competitive world. Traditional university education is not geared up to prepare the students in the new art of IK Management. The management institutions today conduct only short-term courses to give the first exposure. Realizing the need, a pilot market-driven Post-Graduate course has been designed in collaboration with National Centre for Science Information (NCSI), Indian Institute of Science, Bangalore to evolve a model that can fill in the gap in professional manpower demand and supply and can be replicated elsewhere.

Model (Software and procedure) for web-driven distance education system

DSIR in collaboration with Indira Gandhi National Open University, New Delhi has successfully completed a project to evolve a model that would include online lectures, chat discussions with experts, online submission and evaluation of exercises etc.

4.3   Projects Initiated

Computerized botanical database

The project on wild ornamental plants of Himalaya received from Department of Floriculture & Landscaping, Dr. Y S Parmar University of Horticulture & Forestry, Nauni, Solan, HP was approved for financial assistance.

Impact of Technology on Quality of Service Deliveries in Technical and Management Libraries in Karnataka

This project of TA Pai Management Institute, Manipal, will assess the impact of IT-based facilities and services on library efficiency and customer services.

Design and Development of Database on Folk Knowledge: A study in Maharashtra

The Department of Library and Information Science, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad will prepare a database on Folk Knowledge in Maharashtra. The pilot study will cover 12 villages, two from each division of Maharashtra.

Creation and maintenance of a bibliographical and digital image database of available literature and material on Bishnupur terracotta art and sculpture and Traditional design of Potchitra, Baluchori & Madhubani

Under the project the CALIBNET, Kolkata will develop a database of available literature and photographic images and present a digitized form and put on the Internet was also approved. The database would cover the following areas:

- Susnia rock culture of prehistoric stone-age tools
- Terracotta panels on the walls of the temples, in and around Bishanupur and at some specific well known areas
- Conch shell art of fine and exquisite designs of Bishnupur, Hatgram, Shaspur, Patrasayer, Ghutghutia
- Dokra art of Bankura in Bikna village
- Bronze and Bell Metal art of Kenjakura village, Sonamukhi, Patrasayer & Bishnupur
- Baluchari art of Kenjakura, Bishnupu, Sonamukhi
- 'Patchitra' of Beliator (birth place of Jamini Roy), Chhatna, Noadihi, Kalapahari, Madhuban, Hirbandh, Garmas

- Card Games (Dasabataar Taas) of Bishnupur

Updating of existing website and strengthening of electronic networking system

This project of United Planter's Association of South India (UPASI) Tea Research Foundation, Valparai, Coimbatore aims at:

- Establishing database on tea production and weather conditions in the tea growing regions of southern India
- Creating a new information base on organic tea, vermiculture, health effects of tea, product diversification, bibliography of tea tasting, latest information on pesticides residues in tea
- Updating the existing website with more information on different aspect of tea cultivation and manufacturing
- Strengthening network facility with UPASI and its regional centers
- Creating new facilities like chat room, e-business, web counter, etc in the website to have more interaction between research bodies and the end users

The regional centre of UPASI will be in online connection with the Tea Research Institute and Planters and with the Tea Board for the exchange of scientific data/ notes/ reports/ information.

Digital Atlas of the Sacred Groves of the North East India:

The joint project of North-Eastern Regional Institute Science & Technology (NERIST), Dept of Forestry, Nirjuli, Itanagar, Arunachal Pradesh and National Chemical Laboratory (NCL), Pune is for the development of information infrastructure and prototype of Web GIS based digital atlas of the sacred groves of North East India with specific reference to over 150 sacred groves of the state of Arunachal Pradesh.

The exercise would help in evolving strategies for conservation and protection of these unique heritage ecosystems. When implemented fully, it would strengthen and support the biodiversity conservation programs within North East and elsewhere in the country where similar types of ecosystems exist.