
UNIT 4 INFORMATION ANALYSIS AND CONSOLIDATION CENTRES

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4.0 OBJECTIVES

After reading this Unit, you will be able to:

- describe the concept of information analysis and consolidation;
- explain the need for information analysis and consolidation, processes involved in information analysis and consolidation, and different IAC products for different levels of users;
- know the activities and products of IAC Centres; and
- get acquainted with information analysis and consolidation activities performed by some of the R&D centres, information centres, and private organisations in India.

4.1 INTRODUCTION

You have studied the activities and services of information centres in Unit 2. Most of the information centres offer two functional levels of services. At the basic level, information centres disseminate information and materials acquired by them, answer technical reference queries, direct users in need of detailed information for research to proper sources of information and handle journal literature to keep users informed

of the current developments in a particular discipline. At the intermediate level, information centres offer complex literature searches in specific subject field, carry out retrospective searches and provide bibliographies, produce current awareness bulletin, provide selective dissemination of information (SDI) to individuals or group of users based on user's profile, index, abstract and extract the information to disseminate it to the users in response to request or in anticipation. Some information centres, particularly in science and technology, offer highly specialised services including information consolidation and repackaging involving analysis, synthesis and evaluation of information for the users. Such information centres came to be known as information analysis centres and data centres.

The basic process involved in indexing, abstracting and extracting of information is, 'analysis of information'. In indexing activities it is 'subject analysis' and in abstracting and extracting activities it is 'content analysis'. Here no critical evaluation is carried out of the basic contents of the documents. The resultant product is factual, non-critical or non-evaluative. Whereas, in Information Analysis and Consolidation Centres, the emphasis is on 'evaluation' of the contents. The Information Analysis and Consolidation Centres gather everything known about a clearly defined subject-field, analyse and evaluate this information, condense and repackage it in appropriate form for a well defined user group and disseminate it to that user group. In other words IAC Centres provide users timely, authoritative, evaluated and consolidated information in convenient form, which users can understand, assimilate and use with certain degree of confidence and reliability within the framework of their working environment.

In this Unit you will study about the activities and products of Information Analysis and Consolidation (IAC) Centres, need for IAC, processes involved in IAC, and planning and management of IAC Centres. Activities and products of representative IAC Centres in India will also be covered.

4.2 GENESIS OF INFORMATION ANALYSIS AND CONSOLIDATION CENTRES

The need for evaluated and consolidated information arose from the fact that most of the literature in science, technology, health, business, education and related fields is written by experts for experts and cannot be effectively used by non experts or potential users in its original form. In other words information is not presented in the language and form that is understandable, readable and acceptable to the potential users who may benefit from it. Another problem in the effective utilisation of information is overabundance of information on a particular topic. Sheer amount of information scattered over wide range of sources in diverse form, discourage its use by the potential users who may benefit from it. Indexing and abstracting services systematically scan the current primary literature (like periodicals, conference proceedings, research reports etc.) on the particular subject field, select the relevant items, index or summarise each item, and arrange them in a helpful sequence for location and identification of individual items. It has been observed that the volume of indexing and abstracting services have been growing with the alarming growth of primary literature and even to scan the literature of a subject through these highly condensed devices is becoming difficult. What a busy user needs is information, that is critically evaluated, condensed, packaged and made available in a form, which can be immediately used in decision making, problem solving or for any other purpose in hand. To fulfil this need, a new kind of information organisations started emerging in the field, which focused on information analysis and consolidation.

4.2.1 Barriers to the Use of Information

Historically, the concept of information analysis and consolidation evolved in response to the difficulties encountered by the users in the use of information leading to non-use of information by them and the potential users who would have otherwise benefited if information was available to them in more usable form. These difficulties or barriers in the use of information by the users are basically due to the inherent characteristics of the world of information, which are as follows:

- Exponential growth of information and increasing rate of obsolescence: Users have inadequate time reading and assimilating new information;
- Interdisciplinary nature of information leading to scattering and seepage of information: Users can specialise only in restricted subject fields;
- Wide variation in quality and reliability of information: Users find it difficult and have inadequate time for evaluating and selecting the right information;
- Information is presented in multiplicity of languages: Users are not familiar with the language(s) to use the information;
- Information presented in a wide range of standards and formats: Users may not be familiar with that standard or format to use the information;
- Required information is published in documents with restricted circulation: Leading to inaccessibility of information; and
- S&T information is highly technical in nature with technical and trade jargons: Potential user with no technical background cannot comprehend it.

These and similar barriers led to finding solutions to overcome these barriers and developing new kind of information products. The products that emerged as solutions to above mentioned barriers to the use of information are scientific and technical reviews, state-of-the-art reports, handbooks, business, commerce and market summaries, technical writings, popularisation of science writings, extension services in agriculture for farmers and public health services for general population. Some of these products are directed towards specialists (e.g. S&T reviews), some towards people in business and industry (e.g. business, commerce and market summaries) and some are for farmers and general public (e.g. extension services and health services). In all of these products the concept of well-defined user group is clearly present. Hence, the analysis of barriers to the use of information and finding solutions led to the concept of consolidated information.

Self Check Exercise

1) Enumerate the barriers to the use of information.

Note: i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of the Unit.

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4.2.2 Information Consolidation: Definition

UNESCO Symposium on Information Analysis and Consolidation (held in Colombo, Sri Lanka, 12-15 September, 1978) gave the following definition:

“INFORMATION CONSOLIDATION ACTIVITIES is used to define the responsibilities exercised by individuals, departments or organizations for evaluating and compressing relevant documents in order to provide definite user groups with reliable and concise new body of knowledge. Individuals or groups of individuals performing information consolidation activities would each constitute an INFORMATION CONSOLIDATION UNIT.”

Saracevic and Wood (1981) gave the following elaborate definition:

“CONSOLIDATED INFORMATION is public knowledge specifically selected, analyzed, evaluated, and possibly restructured and repackaged for the purpose of serving some of the immediate decisions, problems and information needs of a defined clientele or social group, who otherwise may not be able to effectively and efficiently access and use this knowledge as available in the great amounts of documents or in its original form. The criteria for selection, evaluation, restructuring, and repackaging of this knowledge are derived from the potential clientele.”

Following is a little more concise definition given by Saracevic and Wood (1981):

“CONSOLIDATED INFORMATION is a text(s) or message(s) purposefully structured from existing public knowledge to affect the private knowledge and decisions of individuals who otherwise may not be able to effectively and efficiently access or use this public knowledge from the original amounts or in the original structure and form.”

In other words consolidation of information refers to providing the right information for the right person in the right form and at the right time.

4.2.3 Objectives of Information Consolidation

The basic objectives of Information Consolidation can be enumerated as follows:

- To increase the effectiveness of *information transfer* to the target audience;
- To make the *required information* reach larger audience in accessible and usable form; and
- To encourage more *intensive use of information* in wide range of developmental activities.

Self Check Exercise

2) What is consolidation of information? Give definition of consolidated information.

Note: i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of the Unit.

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4.2.4 Users of Information Analysis and Consolidation Products

Different IAC products serve several distinct types of user groups. The users can be categorised into following six groups:

- 1) Scientists, engineers, professional engaged in R&D activities;
- 2) Policymakers/planners in government;
- 3) Managers and business people in industry and business;
- 4) Technicians, supervisors and paraprofessionals working in government departments, industries and other business concerns;
- 5) Communicators/intermediaries such as extension workers, teachers, etc. communicating new technology or practices to general public; and
- 6) General public: including both rural and urban population.

Education level of these groups varies from highly educated to illiterate group. While there are wide range of information services and products available for the first four groups, last two groups remained unserved till recently. Information requirements of these last two groups need particular attention from information analysis and consolidation efforts, if benefits of S&T knowledge are to be percolated to them.

4.2.5 Processes in Information Analysis and Consolidation

The basic processes involved in information analysis and consolidations activities are:

- 1) Study of potential users to find their information needs and decide on the information product(s) suitable to fulfil those needs.
- 2) Selection of relevant information sources, both primary as well secondary information sources, containing the most useful information for the given user's problems and information needs.
- 3) Evaluation of information contained in these sources for its merit, validity and reliability.
- 4) Analysis of information to identify and extract most salient features conveyed by the given source.
- 5) Restructuring (if necessary) the analysed and extracted information as a new whole, which differ from original presentation and can be used most effectively and efficiently by the user. This may involve synthesis, condensation, rewriting, simplifying, reviews, state-of-the-art presentation, etc. During synthesis the analysed information from one or more sources is condensed and presented in a new arrangement or structure with an interpretive or evaluative point of view. Condensation is derivation of short summary of information from a source or extraction of key statements i.e. sentences, paragraphs, figures, etc.
- 6) Packaging and/or repackaging of restructured information in a form that will increase its use. (Restructuring deals with contents or substance of information while packaging deals with the form of its presentation.)
- 7) Diffusion or Dissemination of information in ways that will encourage and promote its use. This may also involve educating the users in the use of information and marketing of information.
- 8) Feedback from the users and improve the product based on the feedback.



Fig. 4.1: Processes in Information Analysis and Consolidation
(Source: Saracevic and Wood, 1981)

Self Check Exercise

3) Describe the processes involved in information analysis and consolidation.

Note: i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of the Unit.

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4.3 INFORMATION ANALYSIS AND CONSOLIDATION (IAC) CENTRES

Information analysis and consolidation activities are not of recent origin. Its history can be traced back to the 19th century and according to Kertesz (1983) these “are embedded in the tradition of 19th century scientists such as Beilstein and Gmelin, who accepted the challenge to bring some kind of order in the ever increasing flood of data, to make experimental findings conveniently available to other scientists” by means of handbooks and data compilations. According to Kertesz, Beilstein and Gmelin were one-man analysis centres in the truest meaning of the concept and their data compilations are precursors of data books and handbooks of 20th century. However, the term ‘Information Analysis and Consolidation’ is of recent origin. General Information Programme (PGI) of UNESCO, while seeking solutions to the

barriers to the use of information in developing countries, suggested 'information consolidation' as possible solution. PGI, UNESCO sponsored three meetings in the years 1975, 1978 and 1983 respectively on the above topic. In its second meeting, 'UNESCO Symposium on Information Analysis and Consolidation (1978)' the definitions and distinctions, particularly of the terms 'Analysis' and 'Information Consolidation Unit' in relation to their particular function, were discussed at great length. It was observed that 'Analysis' comprised a wide range of functions, such as abstracting, indexing, translation, reviewing, consolidation, etc. However, a number of analysis centres do not always perform the consolidation function. It was also pointed out that 'information consolidation activities' can be performed within institutions or systems other than information analysis centres, even by individuals or groups of individuals. It was therefore decided that the term 'information consolidation activities' should be used. Individuals or groups of individuals performing information consolidation activities would each constitute an 'INFORMATION CONSOLIDATION UNIT (ICU)'. It was pointed out that the most important consolidation function was evaluation, i.e. the retaining of reliable information only. Therefore, the resultant products of information consolidation activities are reliable and concise carrying usually an added value.

While origin of Information Analysis Centres (IACs) was due to untiring efforts of a few dedicated and devoted specialists, the present day Information Consolidation Units (ICUs) have been due to the interest and efforts of numerous sponsoring agencies belonging to both the private and public sectors. It is observed that most of these ICUs are located in the parent institutions and their activities are in conformity with the objectives of the parent institutions, though they may be sponsored or supported by other organisations. (Seetharama, 1997).

4.3.1 Activities, Products and Services of IAC Centres or ICUs

Products and services of Information Analysis Centres (IACs) or Information Consolidation Units (ICUs) vary with the needs of target group to be served, but the basic objectives and processes involved in information analysis and consolidation enumerated above, remain the same. IAC Centres are committed to provide users timely, authoritative, evaluated, information in most convenient and usable form. The staff of such centres has a high level of expertise, as they are actively involved in work in their subject field and also in information processing. Another distinguishing characteristic in the mode of operation of IAC centres is the use of specialists as consultants. The centres are in constant interaction with the specialists and keep track of research and development activities in the respective subject field. The activities of IAC centres in general are as follows:

Identifying Users and User's Needs

User constitutes the most important element in all information consolidation activities and perfect understanding of user's needs is a pre-requisite for any successful IAC product. As a matter of fact, it is now well recognised that information systems and services fail, if user's needs are not taken into account while designing these services. There are several methods available for user studies. Each method has some plus point and some limitations. It is observed that centres which make detailed plan for user studies carefully and carry out the study accordingly, bring out the successful IAC product. The plan consists of following steps:

- i) Surveying the previous studies and literature in general to know about all aspects of user studies.
- ii) Statement of the objectives of the study.
- iii) Determining the variable to be studied and models to be followed.

- iv) Selecting sample of the population to be studied.
- v) Determining the methods for collection of data such as surveying through questionnaire or interview; observation, analysis of previous records or experimentation, etc.
- vi) Determining the method of analysis of data.
- vii) Determining the ways of presentation and utilisation of results.

Selection of Relevant Information Sources

Based on the information needs of the user and the type of IAC product, relevant information sources are selected. Information sources can be categorised into : i) Documentary sources, ii) Institutional sources, and iii) Human sources. Documentary sources are primary, secondary and tertiary sources. While primary and secondary sources contain information on a subject, tertiary sources are used as an aid for selection of primary, secondary, institutional as well as human sources. Among documentary sources, advanced treatises from reputed institutions/publishers, primary peer reviewed periodicals, ad-hoc bibliographies, indexing and abstracting periodicals on the subject concerned, annual reviews or advances in particular subject series from reputed publishers should be selected for consolidation purposes. Publications (like research reports, conference proceedings, etc.) of the institutions actively engaged in research in that subject area should also be considered among the selection of sources. Last but not the least human resources, i.e. specialists in the subject concerned should be identified for consultation purposes. Such specialists, when consulted may provide information on the subject concerned which is not readily available from any other source. Persons involved in selection process are information specialists/librarians, experts in given subject area, or committees involving either one or both.

Evaluation of Information

Evaluation involves judging the intrinsic merit, validity and reliability of information contained in the sources selected for consolidation. Procedures for judging intrinsic values are examination of : i) Reviews and state-of-the-arts publications on that topic: to see if the selected sources are covered by them. ii) Refereeing and peer review: to see if the selected sources have undergone refereeing and peer review process prior to publication, as is the normal practice in scholarly scientific publications. iii) Citation indexes: analysis of amount of citations received by the selected sources which may be author, journal, or institution. The above mentioned procedures can also be used for selection of relevant material for IAC product. Data provided by the given sources also should be examined for its validity and reliability. Besides the expert judgement or the general consensus, there are other procedures for data evaluation such as: i) Comparison of data on the same aspect from different sources, and ii) Testing of data i.e. critical evaluation of data. Many information centres have come up that are concerned with testing the validity and reliability of S&T data. One such centre is Center for Numerical Data Analysis and Synthesis, Purdue University, USA. However, both these procedures are costly.

Analysis of Information Involves Following Steps:

- 1) Study of total contents of selected document or set of documents.
- 2) Identification and extraction of the most relevant information conveyed by them.
- 3) Assessment and verification of extracted information.
- 4) Selection of a scheme for organising and systematising information.
- 5) Sorting of extracted information into heading and subheading according to the table of contents, classification scheme or typology for the subject or mission.

Synthesis of Information (Following Analysis) Involves Following Steps:

- 1) Comparative arrangement and merging of extracted information from many sources.
- 2) Comparison of data from different sources, derivation of consensus and resolution of possible conflicting information.
- 3) Compression of information into structure or form most suited for target users.
- 4) Evaluation of the final product according to criteria related to users and use.

Restructuring and Type of Product

After analysis and synthesis of information from various sources, decision is taken on the type of product. Repackaging and type of product depends on the target audience. Results of user studies should be taken into account while determining the type of IAC product that will satisfy target user's needs. At the same time product should meet the comprehension level of target audience as well as reliably reflect the state of knowledge of data on the given subject. A large number of products are possible. Some of them are:

Reviews: Critical reviews; state-of-the-art reports; case studies; literature reviews, etc.

Reports: Assessment, market and technical reports; alerting bulletins or newsletters.

Databases: Expert databases; subject knowledge databases.

Tailoring and Reduction of Information Material: Abstracts, extracts/excerpts, executive summary.

Data: Data compilation and tables; statistical abstracts, correlations and composites; critical data.

Briefing Paper: To summarise facts to support a conclusion.

Technical Writing: Guides, manuals, instruction sheets, popular articles about a scientific or technical topic.

Handbooks: Compilation of essential data and information on a subject.

Manuals: Book of instruction e.g. repairing a car or operating a machine.

Critical Studies: Comparison of different practices and policies with merits and demerits; impact or future studies.

In addition to above listed products **Newsletters, Translations, Directories, Brochures, Posters, and News Stories** also come under IAC products.

Depending upon the target audience, sources covered, subject treatment and purpose it is going to serve, each of the product has its own requirements, criteria and procedures for the preparation. Many of these products require completely new form of presentation in order to make these products most compatible with user's needs and situation. The process involves determination of extent to which available contents are to be presented, degree of details in information, degree of changes in sequence of presentation in relation to the original, technical sophistication and editorial qualities. For more information on some of these IAC products, please refer to Block 3 of this course.

Packaging and/or Repackaging of Information

After deciding the contents of the IAC product decision is taken on the media and formats in which information is to be presented. The media can be print, microform, audio/visual, electronic as well as interpersonal contact. Format is the arrangement

and presentation of consolidated information in any of the media. The format chosen should not only enhance the use of IAC product but also should contribute to the comprehension, assimilation and recall of its contents by the user.

According to Saracevic and Wood (1981) “Packaging of information is physical recording, arrangement and presentation of information on a given medium and in a given form. Repackaging of information is arrangement of physical media and/or form in which information has been presented, which is tailored to the requirement of a specific clientele. The aim of repackaging is to enhance the acceptance and use of information products and the assimilation and recall of their contents.”

Dissemination and Communication

The work of IAC centre is not complete with the making of a product or provision of a service. Its active and effective dissemination through appropriate channels to the target audience and its effective utilisation by the user form the integral part of the whole information consolidation process. The important channels for communication are:

- i) Interpersonal delivery: The product is delivered personally to the users either on request or in anticipation of demand.
- ii) Group personal delivery: The product is delivered to a whole group of users in a meeting or through a demonstration.
- iii) Strategic placement: The product is placed in locations frequently visited by the users to take notice of and pick it up on their own.
- iv) Local depositories: The product is disseminated through local information centres and libraries.
- v) Mass Media: The product delivered or announced through mass media – newspapers, magazines, through broadcasting i.e. radio or television.
- vi) Mail: The product is delivered through direct or mass mailing.
- vii) Computer networks: The product is delivered through computers via telecommunication networks; online databases; electronic mail; or computer conferencing.

For active and effective dissemination, not only choice of channel is important, equally important is marketing of the IAC product. Conscious and deliberate efforts should be made to market the product and make users aware of its services and benefits.

Feedback

Regular feedback from the users of the product and improve the product based on the feedback is an essential part of information analysis and consolidation process.

Self Check Exercise

- 4) List information analysis and consolidation products.

Note: i) Write your answer in the space given below.

- ii) Check your answer with the answers given at the end of the Unit.

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4.3.2 User Groups and Types of IAC Products

Users of IAC products can be broadly categorised into six groups as discussed in section 4.2.4 of this Unit. Not only information requirements of each user group differ from each other, within each group different types of IAC products are needed by the users depending upon the area of their work as well as stage of that work. Even if similar type of IAC product carrying the same message e.g. creating awareness of a new technology useful for all level of users or a breakthrough in cure of some chronic disease, is to be prepared for different groups of users, the level of treatment of the subject, technical details covered, media and format of the product will be different for each group, though the message conveyed may be the same. The aspect which is equally important to be considered while preparing an IAC product is the communication aspect. The communication is a process by which information is transferred through a given channel (or channels) from a source or a sender to a destination or recipient. The process can be in both directions involving feedback from the recipient. There are many types of communication processes (instituted for specific purposes, audiences, times, circumstances, etc.) such as mass communication, scientific and technical communication, interpersonal communication, teaching, advertising, etc.

Diffusion is a specific type of communication of a special interest in the context of consolidated information. Diffusion is a communication process by which a new idea or an innovation spreads among the members of a social system (or among a defined social group). The process of diffusion is a type of decision making process, which passes through various stages, and each stage has different characteristics and may require different type of consolidated information and different communication channels. According to Roger (1962, 1971), the process of diffusion of information and associated decision making involves five stages :

- i) awareness,
- ii) interest/knowledge,
- iii) attitude formation,
- iv) trial/decision, and
- v) adoption/confirmation.

Let us study what each stage mean. Awareness: An individual (or group) is exposed to an idea or innovation. Interest/knowledge: The individual (or group) becomes interested in the new idea or activity and seeks additional information so an attitude towards it can be formed. Attitude formation: The individual (or group) forms a favourable or unfavourable attitude towards the idea or innovation and assesses it in terms of his/her own or anticipated future situation. Trial/Decision: The individual (or group) seeks information for testing and trying the idea or innovation. Adoption/Confirmation: The individual (or group) decides to continue full use of idea or innovation. The type of IAC product for a user (or user group) will depend upon user's needs for that stage. As users proceed through the diffusion stages (from awareness to confirmation), information requirements become more specific and IAC products become more specific and even more personal. More specific products can serve less specific needs but not the reverse. For instance, an IAC product directed towards attitude formation can also serve as an awareness product but not vice versa. Table 4.1 provides examples of IAC products as they are appropriate for a number of different types of user organisations and as they relate to five stages in the diffusion of ideas or innovations.

Table 4.1 : Examples of IAC Products by Diffusion Stages
(Source : Saracevic and Wood, 1981)

Type of Organisation	Awareness	Interest/ Knowledge	Attitude Formation	Trial/ Decision	Adoption/ Confirmation
Small Industry	Advertising. Product/process announcement. Promotional brochure. Newsletter. Data.	Reports. Group Seminar. Visits. Briefings. Exhibit. Synthesis of requirements.	Seminar on effects. Comparative statistics. Report on alternatives and experiences. Videotapes, films.	Demonstration. Technical manuals. Graphics displays. Databooks. Handbooks.	Operational manuals. Market reports. Handbooks.
Medium Industry	Brochure describing product/process of interest to technical personnel. Market description for managers.	State-of-the-art review describing technology. Resource and economic analysis or summary.	Comparative experiences. Critiques. Market analysis.	Demonstration. Technical assistance manuals. Films, tapes, pictures. Data books.	Operational manuals. Updates. Trends. Synthesis of advances. Handbooks.
Large Industry	Alerting bulletins. Newsletter. Technical news synthesis. Market trends.	Individual seminar on new developments. State-of – the –art. Economic analysis. Synthesis of research results. Critical data. Reply to inquiry.	Competitive analysis. Impact analysis. Historical review of similar efforts. Evaluations.	Demonstration. Testing reports. Technical manuals. Training manuals. Tables of recommended data.	Operational manuals for different levels of personnel. SDI synthesis of advances. Continuous critical and recommended data.
Local Governments	Promotional brochure. Press release. Newsletter announcing reports on topics of local interest.	Workshop for officials. Reviews. Statistical synthesis. Visits. Analysis / synthesis of practices.	Impact analysis. Comparative data. Demonstration. Briefing.	Manuals for implementation. Comparative experiences. Referral. Documentation.	Recurring supply of synthesized information. Establishment of question-answer in procedures.
State Governments	Announcements. Form Letters. Presentation at meetings. Newsletter. Alerting bulletin.	Slide/tape descriptions. Briefing. Reviews. Statistical composites. Synthesis of research findings. Data tables.	Historical data. Comparison with other countries. Demonstration. Impact analysis. Evaluations. Integrative future studies.	Synthesis of practices and trials. Manuals. Referral. Documentation.	Recurring supply of synthesized information. Evaluation reports.
Mass Urban Population	Newspaper articles. Announcements on radio, TV.	Radio and TV, shows. Popularization articles.	Comparing with other practices. Demonstrations.	Show-how information simplified manuals.	Synthesized information fortifying and refining

Type of Organisation	Awareness	Interest/ Knowledge	Attitude Formation	Trial/ Decision	Adoption/ Confirmation
	Popular talks on a given practice or product. Question-answer sheets.	Simplified pamphlets, brochures. Comic Strips. Photo novels. Demonstrations. Exhibits. Popularized journals. Fields Manuals.	Synthesis of fitting with daily life. Possible impacts, positive and negative.	Do-it-yourself booklet.	the practice.
Mass Village Population	Radio announcements. Visits with opinion leaders. Posters and graphic displays. School talks. Training sessions for extension workers.	Extension service demonstrations. Simplified pamphlets. Field manuals in various media (e.g. picture books, comic strips). Graphic displays. Films. Talks.	Talks by opinion leaders. Comparison with other villages. Synthesis of fitting with village life. Impacts. Summary.	Show-how information field manuals. Experimental information. Markets for cash crops. Do-it-yourself booklets.	Reinforcement information. Comparisons. Refinements. Increased know-how information. Market enlargement information.
News Media	Press release. Invitation to demonstration. Press clippings from foreign or technical press. Alerting bulletin.	Demonstration. Popularized articles. Synthesis of findings and results elsewhere. Timetables. Plans.	Graphic material. Comparative data. Briefings and news conferences.	Short guides. Interviews with experts, leaders.	Reports on application. Articles on refinement. Result analysis. Impact analysis.
Academic/ Research Institutions	Journal notices. Short announcement in professional newsletters. Acquisition notices.	State-of-the-art and critical reviews. Synthesized research results. Referral. Journal articles. Text excerpts. Critical data. Data Survey.	Synthesis of critical reports and evaluations. Comparative results. Resource requirements information.	Research data. Training/ education materials. Know-why information. Experiences at other institutions.	Continuing synthesized SDI reports. Selective current contents. Refinements in advance. Critical data.

4.4 PLANNING AND MANAGEMENT OF IAC CENTRES

Chambers 21st century dictionary defines management as “the skill or practice of controlling, directing or planning something, especially a commercial enterprise or activity.” American Management Association defines management as “The guiding of human physical resources into dynamic organisation units that attain their objectives to the satisfaction of those served, and with a high degree of morale and sense of attainment on the part of those rendering the service.” In the context of planning and

management of IAC Centres or ICUs, the second definition seems more appropriate as it explicitly focuses on the target audience, which is of the prime most concern of any IAC centre while developing an IAC product. Planning and management of IAC centres has been dealt in detail by Seetharama (1997) in the publication 'Information Consolidation and Repackaging'. The basic processes involved in planning and management of IAC centres are as follows:

Management involves policy formulation, planning, control, resource allocation, marketing of products and performance evaluation of IAC centres.

Policy Formulation: Policies which act as guide for management to take decisions should be formulated. Policies formulated may be used to direct, or improve, on long term basis, the operations, programme of services, and resources. Policies should be so formulated that they are generally applicable and flexible in meeting a number of contingencies, and at the same time they must clearly indicate the intention of IAC centre in regard to specific areas of concern. Policies formulated should cover four areas viz. collection of materials, IAC products and clientele to be served, staff resources and overall management consideration like administrative and working relationship with the parent institution and cooperative relationship with other information services.

Planning: Basic components of IAC centre should be carefully planned and developed. These components are : i) Information sources, databases, etc. required for providing services, ii) IAC services, iii) Manpower for operation and management of IAC centre, iv) Furniture and equipment, v) Building to house the IAC centre, and vi) Finance.

Resources Needed: Resources needed for the operation and management of IAC centre can be broadly categorised into: i) Human resources, ii) Technical resources, iii) Physical resources, iv) Informational resources, and v) Financial resources.

Human Resources: Performance and efficiency of IAC centre will mainly depend upon the competency of the staff, facilities and environment provided for their work and development. Since, IAC centre is expected to provide variety of information services in specialised subject field and interact with R & D personnel, management personnel, and extension workers, etc. the professional staff of the centre should have high qualification in subject field as well as in library and information science field. Beside, the professional staff should have knowledge and skill pertaining to information consolidation activities.

Technical and Technological Resources: Here decisions on the requirement of computers and telecommunication equipments or printing technology needed for the preparation and dissemination of the services and products of IAC centres are taken. Here most important criteria to be considered is, how these technologies can be combined and integrated to achieve maximum productivity in the operation of IAC centre.

Physical Resources: Physical resources needed for IAC centre include furniture, equipment, building/space facility, etc. The estimate for furniture and equipment should be based on the document collection, number of readers, number of professional/nonprofessional staff. List and specification of major items of furniture/equipment should be made along with the cost estimates and list of selling agents and suppliers.

Information Sources: Information sources required for IAC centre need to be identified depending on the users to be served and their information requirement. This will involve preparation of check list of information sources to suit needs, identification

of the extent to which these needs are currently met by the available sources and the context to which resources have to be augmented and identification of volume, variety, scope of required information sources.

Financial Resources: Financial resources required for the establishment, operation and maintenance of IAC centre should be estimated. It is essential to analyse costs and determine sources and ways of financing. The cost analysis should be based on the assessment of expenditure i.e. capital expenditure and recurring expenditure. Capital expenditure covers expenditure for the acquisition of building, furniture, permanent collection of materials, vehicles, etc. Recurring expenditure covers salaries of staff, running costs (electricity, communication, etc.), maintenance costs (building, equipment, furniture, transport vehicles, etc.), expenses for materials (documents etc.) and supplies, miscellaneous expenses (printing, production, distribution, insurance, hiring of building, etc.).

IAC Products and Services: Work out the details of IAC products and services to be offered, target audience to be served, dissemination channels to be used.

Feedback: A feedback mechanism should be such that regular feedback from the target audience may be obtained to improve the service and product.

Evaluation: IAC centre should be evaluated periodically for its efficiency and productivity. The process of evaluation should be done on continual basis and cover all operations, services and products of IAC centre.

4.5 EXAMPLES OF IAC CENTRES IN INDIA

There is no national level IAC Centre per se operating in the country. However, information analysis and consolidation activities are being carried out by many national level information centres as well as R&D institutions particularly in the field of science and technology in the country and they are bringing out various IAC products for the benefit of different user groups. Some such examples are as follows:

Tata Energy Research Institute (TERI): The institute is engaged in research activities in the field of energy, environment and sustainable development. The institute provides solution to rural energy problems, enhance forest conservation efforts among local communities and promote energy efficiency in the Indian industry. TERI brings out several publications including research periodicals, newsletters, abstract journal, directories, handbooks, manuals, popular publications, and books and audio/visual products like CDs and films for different levels of user groups. Some representative IAC products of TERI are listed below:

Research/Peer Reviewed Journals: 1. *Resources, Energy and Development*. 2. *International Journal of Regulation and Governance*. 3. *Journal of Solar Energy Society of India*.

Abstract journal: *TIDEE – TERI Information Digest on Energy and Environment*.

Newsletters: 1. *TERI Newswire*- Fortnightly newsletter providing current economy-energy-environment scenario based on many newspapers from India. 2. *TERISCOPE*- A bimonthly newsletter on TERI'S activities. 3. *Terragreen* – A popular magazine on environment, published quarterly. 4. *Regulateri* – Published quarterly, the magazine provides information and knowledge to those in business of regulation and provides forum for discussion and debate on issues relating to regulation. 5. *Mycorrhiza News* - Publishes papers by scientists on mycorrhiza research, covers latest news, breakthrough and debate on the subject.

Directory: *TEDDY 2003-04* – TERI Data Directory and Yearbook, published annually. TEDDY is a comprehensive source of information on energy data pertaining to India. *TEDDY Online* is a computerised statistical database on Indian economy with specific reference to energy, environment and economic indicators and some aspects of international economy.

Manuals: 1. *Sustainable Building Design Manual- 2 Vols.* The first volume focuses on policy and regulatory mechanisms and serves as a guide to policy makers and local authorities. The volume 2 targets practitioners and focuses on 'green architecture' by combining concepts and technologies with best practices for each integral design component. 2. *Microplanning Manual for Joint Forest Management Areas* – Manual for those involved in participatory planning and management of natural resources like village communities/institutions/ forest departments/ extension workers and training institutions.

Handbook: *Handbook on Energy, Audit and Management.*

Popular Publications: 1. *TERI's Technologies for Sustainable Development: Tomorrows Solutions Served Today.* 2. *Plastic Waste Management for Delhi.* 3. *Terrapin* – Story books for children with special emphasis on environment education prepared at three levels, level 1 for children between 4-7 years, level 2 for children between 8-11 years, level 3 for children between 12-14 years.

Audio/Visuals: 1. *TERI Uttam Urja* – A documentary film bringing out the benefits of renewable energy technology. 2. *Rural Resources* – The film carries five short duration capsules on fuel wood crises, livestock, the green revolution, irrigation and drinking water for rural households. 3. *Learning to Dream Again* – The film traces the relationship communities have with the forests and involves local people to protect and nurture it. 4. *The ABC of Water Pumping Efficiency* – The educative CD highlights the basics of many pumping systems, methodologies, of energy audits and many opportunities for energy saving.

National Institute of Science Communication and Information Resources (NISCAIR): A constituent unit of Council of Scientific and Industrial Research is providing information services at the national level. The centre publishes research periodicals, R&D newsletters, popular science magazines, abstract journals, state-of-the-art reports on specialised subjects and popular science books. Some of the examples are as follows:

Research/Peer Reviewed Periodicals: 17 in number in different areas of S&T and Information science.

Abstracting Periodicals: 1. *Indian Science Abstracts* (Fortnightly). 2. *Medicinal and Aromatic Plant Abstracts* (Bimonthly).

R&D Newsletters: 1. *CSIR Newsletter* (fortnightly in English) 2. *CSIR Samachar* (monthly in Hindi).

Popular Science Periodicals: 1. *Science Reporter* (monthly in English). 2. *Vigyan Pragati* (monthly in Hindi). 3. *Science- ki- Duniya* (quarterly in Urdu).

Wealth of India: A – Raw Material Series (11 Volumes, 1 Supplement), B – Industrial Products Series (9 Volumes). Wealth of India is in true sense information analysis and consolidation product. It is an encyclopaedia on India's raw material resources covering plants, animals and minerals. Each resource profile is a monographic representation beginning with correct nomenclature, the known names in vernacular, gives brief description of areas of distribution in India, broad parameters of cultivation

in case of plants, pathological problems in case of plants and animals; chemical constituents, products, utilisation, production, consumption (in case of minerals) and trade details. In addition to the above mentioned volumes, 3 volumes plus a supplement was brought out during 1985-1992 and first supplement series comprising 5 volumes (covering period 1987-94) were brought out during 2000-2004.

Bharat Ki Sampada: An encyclopaedia in Hindi on Indian raw materials based on flora, fauna and minerals. Publication is in 17 volumes and 2 supplements.

State-of-the-art Publications: Published over 20 state-of-the-art publications on specialised subjects such as advances in nanoscience and nanotechnology and some popular series like Mango in India, Groundnut in India, Citrus in India, Useful Plants in India, Plant Fruit Flavours, etc.

Popular Science Books: NISCAIR has brought out as many as 60 popular science books under different series like Science Fun Series, Q Series, Vistas in Biotechnology Series, Foundation of Biotechnology Series, Information Technology for All Series, etc.

Indian Council of Agricultural Research (ICAR) : The Council supports study and research in agricultural sciences including agriculture, horticulture, animal sciences, agricultural engineering, fisheries and home sciences. The council co-ordinates agricultural R&D programmes and develops linkages at national and international level with related organisations to enhance the quality of life of the farmers. ICAR has established various research centres to meet the agricultural research and education needs of the country. It has set up 38 state agricultural universities (SAUs) spanning the entire country for teaching, research and extension activities. The Technology Intervention Programme of ICAR is integral part of ICAR's agenda which establishes Krishi Vigyan Kendras (KVKs) for training, research and demonstration of improved technologies to farmers.

Agricultural Extension Division of ICAR has a mandate to take the technology developed at various agricultural research centres to the people at grass-root level i.e. farmers. For that it provides: i) Vocational training to the farmers, ii) Train extension personnel to update their knowledge and skill, iii) Provides single window delivery system of technology, products, services and information through Agricultural Technology Information Centres, and iv) Through Institute-Village-Linkage-Programme (IVLP) it assesses the newly developed technology and carries out necessary refinement to make the technology location specific under various farming systems. ICAR has a large network of frontline ICAR-SAU extension system consisting of 415 Krishi Vigyan Kendras (KVKs), 10 Trainers Training Institutes (TTCs), 70 Institute-Village-Linkage-Programme (IVLP) Centres and 44 Agricultural Technology Information Centres.

ICAR brings out following publications:

Research/Peer Reviewed Journals: 1. *Indian Journal of Animal Sciences* (monthly). 2. *Indian Journal of Agricultural Sciences* (monthly). 3. *Indian Horticulture* (quarterly).

Popular Journals: 1. *Indian Farming* (monthly in English). 2. *Phal Phool* (quarterly in Hindi). 3. *Kheti* (monthly in Hindi).

Digest: *Krishi Chayanica* (quarterly digests in Hindi).

Newsletters: 1. *ICAR-News* (monthly). 2. *ICAR-Reporter* (quarterly).

Handbooks: 1. *Handbook of Agriculture*. 2. *Handbook of Animal Husbandry*. 3. *Handbook of Horticulture*. 4. *Handbook of Plant Tissue Culture*. 5. *Handbook of Rock Gardening on the Hills*.

Text Books: Published over 8 text-books in different areas of agricultural sciences and technology.

Films: Produced 44 films in areas like Crop Sciences (13 films), Fisheries (7 films), Animal Sciences (9 films), Natural Resources Management (8 films), Horticulture (4 films) and Agricultural Engineering (3 films).

Centre for Monitoring of Indian Economy (CMIE) Pvt. Ltd.: CMIE is an IAC centre which based on economic and business data of India carries out research and brings out several IAC products and services in different sectors of economy such as agriculture, energy, infrastructure, industry, corporate, capital market, investments, trade, etc. CMIE's research and its databases are offered in the form of well designed services. These are available in print as well as in electronic formats. Some of its services and databases are Business Beacon, Industry Analysis Service, Economic Intelligence Service, India Trades, Mergers and Acquisitions, Indian Harvest, etc.

4.6 SUMMARY

It has been observed that non-use or relatively less use of literature in science and technology, health, business, education and related fields are not only due to overabundance and scattering of literature in diverse sources, but also due to the fact that information is not packaged in a form useful to different group of users. Users at different levels require appropriate information, restructured and repackaged, in a form which they can understand and immediately use for decision making, problem solving or any other purpose in hand. This led to the concept of information analysis and consolidation. This Unit deals with definition of information consolidation, benefits of information consolidation, processes involved in information consolidation and products of information analysis and consolidation activities. Activities and services of IAC centres, planning and management of IAC centres, user groups and types of IAC products have been dealt with. Activities and products of representative IAC centres in India have also been covered.

4.7 ANSWERS TO SELF CHECK EXERCISES

1) Barriers to the use of information are as follows:

- Exponential growth of information and increasing rate of obsolescence;
- Interdisciplinary nature of information leading to scattering and seepage of information;
- Wide variation in quality and reliability of information;
- Language barrier;
- Information available in a wide range of standards and formats unfamiliar for particular group of users;
- Required information is published in documents with restricted circulation; and
- S&T information is highly technical in nature with technical and trade jargons.

- 2) Consolidation of information involves gathering of information about a clearly defined subject field, analysing and evaluating this information, condensing and restructuring the information, and packaging and repackaging it in appropriate form for a well defined user group. UNESCO Symposium on Information Analysis and Consolidation (held in Colombo, Sri Lanka, 12-15 September, 1978) gave the following definition:

“INFORMATION CONSOLIDATION ACTIVITIES is used to define the responsibilities exercised by individuals, departments or organizations for evaluating and compressing relevant documents in order to provide definite user groups with reliable and concise new body of knowledge. Individuals or groups of individuals performing information consolidation activities would each constitute an INFORMATION CONSOLIDATION UNIT.”

“CONSOLIDATED INFORMATION is public knowledge specifically selected, analyzed, evaluated, and possibly restructured and repackaged for the purpose of serving some of the immediate decisions, problems and information needs of a defined clientele or social group, who otherwise may not be able to effectively and efficiently access and use this knowledge as available in the great amounts of documents or in its original form. The criteria for selection, evaluation, restructuring, and repackaging of this knowledge are derived from the potential clientele.” (Saracevic and Wood, 1981).

- 3) The basic processes involved in information analysis and consolidation are:
- i) Study of potential users to find their information needs and decide on the information product (s) suitable to fulfill those needs;
 - ii) Selection of relevant information sources, both primary as well secondary information sources, containing the most useful information for the given user's problems and information needs;
 - iii) Evaluation of information contained in these sources for its merit, validity and reliability;
 - iv) Analysis of information to identify and extract most salient features conveyed by the given source;
 - v) Restructuring (if necessary) the analysed and extracted information as a new whole which differ from original presentation and can be used most effectively and efficiently by the user. This may involve synthesis, condensation, rewriting, simplifying, reviews, state-of-the-art presentation, etc. During synthesis the analysed information from one or more sources is condensed and presented in a new arrangement or structure with an interpretive or evaluative point of view. Condensation is derivation of short summary of information from a source or extraction of key statements i.e. sentences, paragraphs, figures, etc.
 - vi) Packaging and/or repackaging of restructured information in a form that will increase its use. (Restructuring deals with contents or substance of information while packaging deals with the form of its presentation.)
 - vii) Diffusion or Dissemination of information in ways that will encourage and promote its use. This may also involve educating the users in the use of information and marketing of information.
 - viii) Feedback from the users and improve the product based on the feedback.

4) Information analysis and consolidation products are as follows:

Reviews: Critical reviews; state-of-the-arts reports; case studies; literature reviews, etc.

Reports: Assessment, market and technical reports; alerting bulletins or newsletters.

Databases: Expert databases; subject knowledge databases.

Tailoring and Reduction of Information Material: Abstracts, extracts/excerpts, executive summary.

Data: Data compilation and tables; statistical abstracts, correlations and composites; critical data.

Briefing Paper: To summarise facts to support a conclusion.

Technical Writing: Guides, manuals, instruction sheets, popular articles about a scientific or technical topic.

Handbooks: Compilation of essential data and information on a subject.

Manuals: Book of instruction e.g. repairing a car or operating a machine.

Critical Studies: Comparison of different practices and policies with merits and demerits; impact or future studies.

In addition to above listed products **Newsletters, Translations, Directories, Brochures, Posters, and News Stories** also come under IAC products.

4.8 KEYWORDS

Analysis of Information	: It is a process of determining and isolating most salient information conveyed by an information source and separating this information in its constituent elements on the basis of predetermined evaluation and other criteria.
Evaluation of Information	: It is a process of ascertaining and appraising the intrinsic merit, validity and reliability of information conveyed, comparison of information on the same topic from variety of sources and if possible a resolution or reconciliation of conflicting information.
Consolidation of Information	: It is a process of merging of information from one or more sources and presenting in a new arrangement tailored to the requirement of a specific clientele.
Information Analysis Centre	: It is a formally structured organisational unit specifically (but not necessarily exclusively) established for the purpose of acquiring, selecting, storing, retrieving, evaluating, analysing, and synthesising a body of information in a clearly defined specialised field or pertaining to a specified mission with the intent of compiling, digesting, repackaging, or otherwise organising and presenting pertinent information in a form most authoritative, timely, and useful to a society of peers and management.

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