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ARTICLES

Human Relations in Librarianship

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Abstract

Emphasized that people are the most important assets an organization like library can have. Library administrators must be familiar with the concept of human behaviour as people/staff/users have different needs, motives, values and expectations. Good managers have to understand his staff and develop appropriate strategy accordingly to improve productivity of the organization. The author defined the term 'human relations', indicated human relations within the system and sources of conflict. Also discussed another aspect of HR in organization like library, that is, interaction with users. Lastly, IT is discussed with relation to HR.

1. Introduction

Major changes are taking place in the society in recent times which have greatly altered the world of work. The introduction of new technology, economic instability and intense competition has had an impact on all organizations. Libraries and Information Centres like any other organizations can no longer afford to ignore the psychological, technical /technological, sociological, economical and political changes taking place both in the external and internal environments of their organizations. Consequently, the work of library and information professionals has become increasingly complex with the rise of new technology, changing information needs, increased demand coupled with reduced government support. As a result, considerable pressures have been exerted on librarians in planning, organizing resources, motivating staff and evaluating their achievements.

In addition, technological, social and educational change has affected the attitudes to work among library and information staff. They have high material expectations and are less tolerant of working conditions marred by poor standards of health and safety, high levels of boredom, and authoritarian management styles. They want to have a say in the shaping of their working environment and are less prepared to accept decisions made without consultation by management, i.e., they would like to participate in the decision-making process.

Nevertheless, we are better prepared today to deal with the problems in library

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administration because we not only have the **basic work of management** theories, but also staff who are better educated and more interested in participation. As people are the most important asset an organization like a library can have, a humanistic approach based on the work of Maslow, Herzberg, McGregor and other motivational psychologists will provide an ideal framework for considering the complexity of forces which are having an impact on library administration of all kinds. But, to practise good HR (Human Relations one must be familiar with the concept of human behaviour as people/staff/users have different needs, motives, values and expectations. These differences cause dissimilarity in human behaviour and a good manager will do well to understand his staff and develop an appropriate strategy to get the best out of them and to achieve the desired level of performance and productivity that the organization had set itself to, in the beginning.

2. Definitional Analysis

In attempting to discuss this subject of HR, it would be helpful to define and delimit the use of the terms and consider some of the resulting implications. This is especially because the meanings of terms depend on the context in which they are used.

2.1 Human Relations :

Human Relations (=HR) can be defined as "a phenomenon of organized human activity directed towards the promotion of cooperative and happy work relationships." In other words, "HR is getting work done by people with their hearts in the job."

Webster's Third New International Dictionary, however, defines HR as the social relations between human beings; and/or a study of the human problems arising from organizational and interpersonal relations, especially with reference to employer-employee relationship and the interaction between personal traits, group membership and productive efficiency.

According to Sanford, HR deals with the creation and development of our environment in which individuals are motivated to accomplish organizational objectives because of the need satisfaction such environment offers. Echoing similar views, some theorists contend that HR is an art and managers should practise this art for their own success as well as the success of their organizations in which they function.

As a matter of fact, discontented a disillusioned with the economic man concept of traditional theorists, focus of scholars and practitioners shifted to the human dimension in organizations, resulting in the emergence of HR movement which emphasized on the importance of individuals as human beings and not mere factors of production. In other

words, the HR movement de-emphasized the economic man concept and pointed out the importance of work environment to the betterment of workers and to the organization.

However, it is difficult to define clearly the boundaries of Human Relations Movement and Behavioural Science approach. The latter is considered as broader extension of HR movement and is inter-disciplinary in nature. Consequently, one can see as components of HR — individual behaviour, group behaviour, interpersonal behaviour and human behaviour in the cultural context, with inputs coming respectively from psychology, sociology, social psychology and cultural anthropology.

Lippith has listed the influence of non-economic factors : motivation, leadership, communications and change processes, group dynamics, personality studies, individual behaviour, intergroup relationships, social system approach to organizations, decision-making processes as some of the major areas of contribution under the HR or Behavioural Science Movement — all of which are quite relevant and applicable to library and information environments. In other words, one can see that the HR school while it organized the principle of division of labour (scientific approach), paid special attention to the feelings and attitudes of the worker — a humanistic approach, if one may say.

2.2 Public Relations and Promotion :

In the context of HR, two terms that seem to be related are Public Relations and Promotion. While ***Promotion*** (involves getting the word that the library is offering this program or is making that resource available to its patrons and includes advertising, publicity, in-house displays, regular features in the print and electronic media, and even "word of mouth" campaigns, etc.) is more of a ***monolouge*** where the library simply articulates what it is and what it is doing, ***Public Relations*** (PR) is more truly communication in that it is a ***two-way process*** depending on feedback in both directions and is a dialogue with the library community.

PR functions include : counselling based on understanding of human behaviour; analyzing future trends and predicting their consequences; a search in public opinion, attitudes, expectations and advising a necessary action, establishing and maintaining two-way communication based on truth and full information, preventing conflict and misunderstanding, promoting mutual respect and social responsibility.

Thus, one can see considerable overlap between HR and PR functions, with emphasis or focus on people-orientation/customer satisfaction/customer involvement. Perhaps, these two terms along with Promotion of Marketing are complementary to each other.

3. Human Relations within the System

3.1 Peer Relationships :

In spite of the fact that it has been well realized and recognized that healthy human relations in libraries result in efficiency, effectiveness and productivity and that unhealthy relations result in low morale, low commitment and low productivity, it is ironical that interplay of HR is the most neglected aspect of librarianship. In a library context, HR can be focused on three components, namely, library staff, library management/authority and readers/users of the library.

Among the three components mentioned above, the need for good peer/staff relationship is most obvious as they individually and collectively are striving to achieve the objectives/ goals of the library by constant interaction, firstly, among themselves and secondly, with the management and users. This aspect has become all the more important in recent times due to the radical changes coming into play and which have an impact on the organization of libraries and delivery of information services. Further, as it is people who have to work together to achieve success in the changed environment, it has become necessary for information professionals to acquire new skills as also to work with groups, including disparate groups to fulfill their mission of information delivery.

In other words, the success of any organization depends on the people, their calibre and their attitude to succeed and out-perform. It may be said that human resource appreciates (barring some or many!) with age and experience, unlike machinery that gets depreciated with time and age. However, this is possible when people are developed and kept satisfied on a continual basis. This is easily said than done as human beings exhibit a variety of traits and characteristics and are basically different from one another, i.e., there is no uniform pattern of behaviour amongst all staff members — professional and non-professional — working in a library. In other words, each individual **psyche** is different, and an understanding of the same is a pre-requisite for a healthy relationship and consequently a fruitful interaction. On the other hand, the **commitment to work** may be dependent on the role or influence work has on one's own life — the more they have work or job satisfaction, the more committed they become.

To illustrate, if an information professional is gregarious in nature and is interested in meeting and interacting with users, he may be suitable to man the circulation or reference desk. Put him in a technical processing section where he is away from people, his psyche suffers and also his commitment to work as it gives little or no satisfaction, or, rather,

dissatisfaction resulting in poor performance and productivity. Perhaps this could have been avoided if proper selection and placement strategies based on the needs of work position and that of the worker recruited were considered.

Slater's research in the context of industrial and commercial libraries has thrown up an interesting observation that negative customer perceptions relate more to the staff than the technical system. This may be a result of the way in which the service is organized or the level at which it is resourced (staff to busy to help; assistance, if any, too generalized or superficial); or due to the capabilities of an individual staff member (ignorant and ill-educated; willing, but not competent; lacks communicative and interpretative skills; misfit); or a lack of enthusiasm indicative of a poor sense of group affiliation and team spirit.

The last mentioned, namely, team spirit, is the mainstay of any successful library and lack of it may be due to problems with "the boss" — the **absentee boss**, who is either "always out at meetings" or is unavailable most of the time and is therefore, remote from the day-to-day reality of service delivery; the **uncommunicative boss** who does not share information with the staff and does not explain why; the **burnt-out boss** who doesn't seem to care much and operates with a *laissez faire* management style; the **incompetent boss** who does not have the competency required of the position; **over-enthusiastic boss** who has unrealistic expectations and sets impossible targets; the **bandwagon boss** who leaps, erratically, from one passing fashion to another without ever following a coherent set of objectives; the **threatening boss** who experiences power but does not inspire thrust; and the **over-burdened boss** who has not learnt how to delegate work.

On the other hand, there is an equally lengthy checklist in regard to problems of working with peer colleagues or with those who are subordinate in the organizational hierarchy :– refusal to do something i.e. that's not my job attitude; doing something grudgingly; lack of commitment; laziness and/or lack of throughness; unwillingness to change, absenteeism and bad time keeping; a "prima donna" attitude; people with poor interpersonal skills, people who lack confidence in themselves; people who express boredom and/or frustration with work; incompetence, etc.

In other words, despite best efforts of all concerned, conflict problems are inevitable in any organization because of diversity of interests, objectives, needs and personality types which exist among people who work together. In addition, conflicts develop when status hierarchy is bypassed. A certain amount of conflict is necessary and useful if an organization is to be creative and forward looking, since acceptance on every matter would only lead to stagnation. However, conflict situations should not be allowed to prevail as it would cause

tension, anxiety and frustration, often leading to a breakdown in relationship and a deterioration in job performance. Therefore a strategy consisting of (i) recognition (or being sensitive) to potential conflict situations at work; (ii) reflection on possible ways out of the situation; and (iii) responding assertively needs to be worked out in dealing conflict.

3.2 Sources of Conflict :

Within libraries and information centres, there are many sources of conflict — organizational structure where different departments have different time horizones, values, goals and management styles; uncertainty and complexity in external environment; material technology, which determines interdependence and independence of departments, professioan terminology; policies; role expectancies of subordinates and managers; competition between parties for scarce resources or where one group gains at the expense of the another; personal interests of individuals or groups; physical separations and dependency of one party on another (Jo Bryson).

In resolving work conflicts between management and staff, three techniques are used — *Win-lose methods* where the manager or supervisor inevitably wins and the employee loses; *Lose-lose methods,* where no one is happy (The method may be a compromise, or involves side payments or exchange of favours or submit the issue to a neutral third party); Win-win ***methods*** provide a solution which is acceptable to all. In addition and/or substitution, managers use different styles — avoidance style, smoothing style, forcing style, compromise style, collaborative style — in managing conflict.

3.3 Problems by Gender :

While little or no work has been initiated in India regarding Gender and Librarianship, it would be correct to infer that the situation of women is similar to what prevails in the West. Not many occupy senior posts, which is, perhaps, in conformity with the culture of Indian society which subordinates women to men through an institutionalized status system whereby men are accorded greater prestige and which perceives women as less interested in career development than men. To a certain extent it may be true as women seem to be less active and visible than men in the "profession". While dynamism, aggression, decisiveness are perceived as qualities attributed to men and considered to be appropriate for management, it should be recognized that qualities of caring and nurturing attributed to women contribute to team building and the sort of supportive culture which helps people "feel good" about their work. In other words, each of the two sexes can contribute i n their own way for the efficient and effective management of libraries.

4. Interaction with Users

In an information-intensive society, the libraries necessarily have to fulfill the most basic as well as other information needs of the users. However, it is ironical that in spite of tall claims, the users remain a neglected component. But, this situation has changed considerably in recent times and more attention is being given to the study of users — their needs, attitudes, behaviour, etc. — with the objective of providing appropriate services at the right time. In other words, interaction between the library staff and users has increased in considerable measure.

Nevertheless, it has been observed that in situations where the collection and. service are developed simply in response to expressed demands, low expectations become a self-fulfilling prophecy — reasons being : expectations of self-service due to indoctrination that use of a library is largely a self-service process, attitudes of librarians, users' insecurity, lack of trust due to the commonly held perception that users' problems are so complex that the library staff couldn't possibly understand them. To add to the complexity is the fact that the psychological state of the users who are apathetic/ indifferent, sophisticated, hostile, critical, etc. It is also quite likely that the same user assumes different roles at different times. The types of users one encounters in Libraries may be categorised as apathetic/indifferent, sophisticated (where the user assumes he knows as much if not more than the staff), hostile (to the library staff, his ideas etc.), critical users whose orientation is rational, logical, scientific and thought-centred, credent users who place credence on the library, its staff; its communication etc. While the above mentioned roles have been treated serparately, it is quite likely also for one and the same user to assume different roles at different times. Therefore, it is necessary that the staff be aware of the different psychological states and capabilities of the users/readers and orient themselves in such a manner so that a fruitful and useful interaction results.

On the other hand, negative perception and reactions of the users to the library and its staff may be tackled successfully by designing and developing user education programmes, that highlight the potentialities of libraries in information transfer. However, these programmes can be effective only — if it is given at the time of need and is relevant and problem-oriented; if there is recognition of the level of the user; when emphasis shifts from teaching users how to use the library to challenging and helping them to learn on their own; when the reference and information services adopt a more aggressive approach than a "Respond-when-asked" approach; when there is user involvement in the programme; when there is a continuous feedback from the users; and when there is continuing research in integrated library instruction. In other words, a humanistic approach should be adopted in user education programmes which may be direct, indirect, or a combination of both methods. Whatever be the method adopted, it should result in an interaction leading to

desirable or favourable results. In summary, it means that interactions should facilitate building up of personal rapport with users. While this is by no means an easy task, efforts in this direction are worthwhile.

5. Outside the Working Environment

In view of the fact that no library can be self-sufficient as far as its information resources are concerned, resource sharing/networking activities have assumed considerable importance. This means entering into partnerships with other libraries for facilitating access to information in whatever form and where ever located to users — an implication of Ranganathan's Five laws of Library Science. The role of Human Relations, in this context, is obvious as resource-sharing will surely demand from librarians and library administrators more time, skill and patience than are presently required of them. In addition, it would require change in the attitudes of the librarians and library staff to find ways and means by which one can help one another and in turn provide the best kind of access to information which users need. This necessarily requires deeper understanding of users also, there is a need for change in attitudes if resource-sharing/networking arrangements are to be successful.

In effect, it would mean greater interaction between fellow information professionals (wherever they are located), the objective being better utilisation of information generated, collected and organised in libraries by librarians. In the process of building up information resources, the information professionals have to deal with publishers, distributors, dealers, booksellers, etc necessitating interaction with them and consequent development of relationships which need to be ethical as otherwise it can lead to disastrous consequences. Perhaps, it is here that professional bodies can evolve a code of professional ethics which covers among other things relationships not only between information professionals, but also between professionals and non-professionals within and outside the system. This would serve as a guideline for professionals, especially, the new entrants, all the time and thereby improve the image of librarians.

6. Human Interface to Technology

Information Technology (IT) can be used in libraries in the context of Ranaganathan's Fourth Law "Save the time of the Reader/Staff" for supporting clerical functions associated with acquisition, technical. processing, and circulation work, information storage and retrieval, and information dissemination services; management information services; enhancement and maintenance of service; and cooperation in the sharing of resources through the operation of such schemes as shared acquisition; shared cataloguing and interlending agreements. It may, however, be observed that full exploitation of IT in developing countries is beset with obstacles,

namely, lack of trained personnel; inherent resistance to technology among operating staff and potential end-users; lack of stable power supply, conservation and automation allergy; computer illiteracy, etc. Therefore, it becomes necessary for librarians to consider the approach for the introduction of new technology. While planning involves consideration of costs, benefits and operational satisfaction in the preliminary phase, implementation chiefly involves management of human relations and the adoption of systematic approach to change which takes account of the wider implications of altering current practices.

The implications of microelectronics revolution for staffing library and information services are not yet clear though certain tendencies are becoming visible. One realisation has been that the machine cannot replace librarians. There is now an opportunity for professionals freed from routine tasks to concentrate on Human Relations, both with users and other professionals, and recognise the support that can be derived.

However, one impact — negative, if I may say so — would be that the content of library jobs invariably changes with automation and may well affect job satisfaction. For example, the technical processing staff may not be taking decisions regarding cataloguing codes and classification systems, but only will be checking and manipulating centrally produced records leading to job impoverishment instead of job enrichment and job enlargement. Another problem would be in relation to train existing staff in computerization. There would be resistance from them, especially, those who have had professional education long time ago. Thus, one can see that technological revolution can result in personnel unrest and major interruptions. Consequently, as is often the case in Human Relations, the attitudes and personalities of the people involved have as much influence on the effectiveness of the service as the procedures one defines.

Another point that merits attention is in relation to design of information systems — most of the information systems seem to have been designed for use by information professionals rather than users! It becomes necessary now, in the light of IT, to design national information systems for use by the problem-solvers (end-user), the primary client. In other words, there is a need for re-orientation in the design and development of new information systems/services/products.

On the question of knowledge and skills of an information professional in an IT-based environment : he should have knowledge on micro computing, marketing, communication, technology and its applicability, information seeking behaviour, societal issues that develop from IT, such as, copyright, privacy, database security, information management and economics of information in addition to knowledge of traditional subjects. On the other hand, skills required includes: skills in communication, systems analysis, human/inter-personal relations and financial planning; managerial skills for technology management and application to library and information

work; advocacy skills, a greater sensitivity to social and political forces and an increased ability to define and articulate values and value systems. In addition, the librarians should develop useful attitudes, such as, flexibility, a sense of humour, patience, persistence, sensitivity and an inquiring and must be future-oriented, positive, opportunistic and people-centred.

On their part, the users need to change their attitude and behaviour in relation to information systems/ services/ products and their use. It maybe useful, as mentioned in an earlier section, for librarians to design and apply appropriate user education/ sensitisation programmes to bring about this change.

7. Professionalism

A few lines about professionalism in this context would be in order. More than ever before, the professional associations have a role to play. Apart from formulating objectives for promoting library education, library movement, etc. the associations need to pay special attention to Human Relations in librarianship by organising continuing education programmes on this subject as well as impressing on Library Schools to include HR as a component in the curricula of Bachelors and Master's programmes in Library and Information Science. The study circles forming part of the associations can organise lectures and colloquia on the various facets of HR as applicable to librarianship.

Coming to Library Education, the question is how does one teach Human Relations to students and what should they be taught? Perhaps, they should be taught about the importance of group dynamics, task force assessments, problem-solving skills, supervisor-employee relationships, and peer evaluation, human communication theories, processes and practices and upon the social environment, within which a library functions. This should form the most important part in, any curriculum. It has been suggested that these aspects. can be taught by employing the case approach which involves several tools, such as, simulation of actual situations, in-basket exercises, role playing, and, of course, case studies per se. Whatever approach is adopted, it is necessary that library schools ensure that students should recognise and understand the importance of such human relationships.

The last aspect I would like to touch upon is about the media in building human relations. It is heartening to note that some effort has been put in this direction. While recognising that Information Science can contribute a great deal to the recognition of differences among human beings as positive resources to be shared and mutually explored, it has been suggested that by co-ordinating multi cultural messages of multimedia formats, it will be possible to design effectively information systems capable of responding to human rights and relations information needs. Cornell

University Interactive Theatre, for example, has used latest techniques of multimedia interactive video on CD-ROM in their Human Relations training programme — which explores how people can work together effectively and openly in the work place.

8. Concluding Remarks

So, we have talked about *almost* all the facets of the theme "Human Relations in Librarianship". In conclusion, it may be stated that there is a widespread impression that human issues are ignored — probably, because there is a lack of knowledge of what human issues really are. This is evident from the three general criticisms that recur in the literature of librarianship which relate to the human/social dimension :

- that the primary focus of librarians is on internal processes and materials
- that the needs and perceptions of customers/users/readers are consistently disregarded.
- that librarianship lacks leadership or perhaps, it is conspicuous by its absence.

Therefore, as McKee puts it "...a major challenge for managers at all levels within librarianship is to shift the focus away from institutions and hierarchies and towards people and tasks; to motivate individuals and build team spirit; and to create structure and cultures by which people can satisfy personal aspirations in achieving organisational objectives".

In this context, the following practical suggestions to improve Human Relations offered by Martin Bruce, a psychologist, are worth considering :

1. Improve your own general understanding of human behaviour.
2. Accept the fact that others do not always see things as you do.
3. In any differences of opinion, consider the possibility that you may not have the right answer.
4. Show your employees / co-workers that you are interested in them and that you want their ideas on how conditions can be improved.
5. Treat your employees / co-workers as individuals; *never deal with them impersonally.*
6. Respect difference of opinion.
7. As far as possible, give explanations for your / management actions.
8. Provide information and guidance on matters affecting workers security.
9. Make reasonable efforts to keep jobs interesting.

10. Encourage promotion from within.
11. Express appreciation *publicly* for jobs well done.
12. Offer criticism *privately,* in the from of constructive suggestions for improvement.
13. Train supervisors to be concerned about people they supervise, the same as they would be about merchandise, materials or equipment.
14. Keep your staff up-to-date on matters that affect them.
15. Stop rumours and provide correct information.
16. "Be Fair".

To conclude — what is needed is a sense of purpose and professional commitment to Human Relations. While the two major functions of education are to enlighten the mind and to illuminate the heart of an individual, most of the (library) educational institutions today seem to educate the "heads" and "hands" of young people but not their "hearts"! Finally, when librarians and teachers in Library and Information Science remain in the ivory towers they have built round themselves, Human Relations in Librarianship also remains there locked up. It is time we come out and start doing something. Nevertheless, it must be remembered that good human relations may not be the answer to every problem.

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Assessment and Accreditation of the Collegiate Education by NAAC with reference to Modernization of College Libraries

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Abstract

Traced the genesis of the National Assessment and Accreditation Council (NAAC) in India. Highlighted the processes involved in the assessment and accreditation of the collegiate education. Discussed the criteria used for this purpose by the NAAC with particular reference to the modernization of college libraries. Factors to be considered by the college libraries to get themselves prepared for NAAC assessment are also discussed.

1 Introduction

In many developed countries, quality assessment and accreditation in higher education through an external agency have become the part of campus lexicon. In the context of worldwide changes in higher education, an International Conference on Quality Assurance in Higher Education was held in Hongkong in 1991. 23 countries of the world participated in this conference felt the need for internal quality assurance and external quality assessment in higher education. It was envisaged that the whole spectrum of quality assessment would vary from country to country depending on their political structure, national traditions and education systems in which they function. Globalization has added one more dimension to higher education, i.e. the need for providing quality education and producing qualified graduates who can work in multi-racial and multi-cultural environments. Higher education, being a tradable and marketable commodity under the GATS (General Agreement of Trade in Service) has been internationalized. This objective condition has necessitated the establishment of international links to extend knowledge and to coordinate the activities of national agencies engaged in the assessment, accreditation and academic audit. With this in mind an International Network for Quality Assurance Agencies in Higher Education (INQAAHE) was launched during the Honkong Conference. More than 120 countries including India are the members of INQAAHE. The World Conference on Higher Education organized by Unesco in 1998 also pointed out the importance of the assessment and accreditation of higher education institutions and their programmes.

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Higher education in India has expanded since independence in the form of increase in number of colleges, universities and centres of higher learning, and in the increase in number of students as well as courses. During 1950-51 there were 27 universities, about 700 colleges, and about 1,74,000 students while now there are 307 universities, 13,000 colleges and about 7.5 million students. This growth of numbers occurred during the past 50 years has, however, not been uniform. There is large disparity in the quality of education imparted by various institutions. A limited number of them are offering excellent services whereas others are mediocre or average. Concerted efforts for the improvement of the quality of higher education and an effective role that the library can play for this are evident in the recommendations of different committees and commissions constituted by the Central as well as State Governments at different points of time. But only very little has happened in terms of quality.

The National Assessment and Accreditation Council (NAAC) is an autonomous body set up by the University Grants Commission (UGC) in 1994 in pursuance of the Section 12CCC of the UGC Act, 1956 to establish quality in higher education institutions, especially universities and colleges. In addition to the NAAC, National Board of Accreditation (NBA) under All India Council of Technical Education (AICTE) and Distance Education Council (DEC) of the Indira Gandhi National Open University (IGNOU) are also engaged in the task of assessment and accreditation of engineering / technical institutions and open university / distance education system respectively. There are agencies that have been established through Acts of Parliament – such as, Medical Council of India (MCI), Pharmacy Council of India (PCI), National Council of Teacher Education (NCTE), Bar Council of India (BCI), Indian Nursing Council (INC), Dentists' Council of India (DCI), Central Council of Indian Medicine (CCIM), Veterinary Council of India (VCI) and Rehabilitation Council of India (RCI) which give 'recognition' to the institutions under their jurisdiction after inspecting them. However, these agencies do not assess and accredit institutions in a formal sense. The NAAC has done remarkable job by developing a system of evaluation and accreditation suitable to Indian universities and colleges, and has completed the process of assessment and accreditation in a number of universities and colleges in India. The recent decision of the Ministry of Human Resource and Development (MHRD) is to provide development grants to the colleges and universities only after their assessment and accreditation by the NAAC for ensuring quality in higher education. The MHRD and the UGC are reported to be developing guidelines to link a portion of funding with the accreditation outcome.

2 Process of NAAC

Colleges willing for assessment and accreditation by the NAAC are required to pass through the following processes:

- Submission of Letter of Intent before the NAAC;
- Preparation of Self-study Report;
- Validation of the Self-study Report by NAAC Peer Team through an on-site visit; and
- Awarding grade to Colleges (Accreditation).

2.1 Submission of Letter of Intent

In pursuance of the decision of the Governing Body, the college principal should submit a letter of intent in prescribed format before the NAAC, along with the general information of the college, for assessment and accreditation. When a college comes forward voluntarily to be assessed by the NAAC, the implicit message conveyed is that such a college is in a position to aspire for a quality and wishes to be evaluated for the same. NAAC scrutinizes the application of the college for its eligibility. After receiving a positive response from the NAAC, the college sends the prescribed fee for assessment and accreditation. On receipt of the fee, NAAC sends the manuals and guidelines to enable the college to prepare the self-study report in prescribed format.

2.2 Preparation of Self-study Report (SSR)

The preparation of SSR in accordance with the NAAC guidelines is an intensive participative exercise undertaken by the colleges that volunteer for accreditation. It is the backbone of entire process. It probably is the first occasion for many colleges to compile college related data and documents in a systematic manner, leading to a holistic picture of the college under assessment. They give a direction to the peer team to look for excellence in the most relevant aspects. In this stage, it is imperative on the part of the college authority to form a committee consisting of the principal, librarian, representative of the teachers and non-teaching staff. This committee will collect necessary data against the criterion statement of the NAAC guidelines and will prepare the SSR under the leadership of the principal. While preparing the SSR, supporting evidences for the data furnished in the SSR are to be kept in mind since the peer team may ask for the same. Sometimes colleges underplay or exaggerate their strengths and weaknesses. Apart from documentation and working together, efforts are made by the college to improve the infrastructure and initiate new mechanisms in order to impress the peer team.

Here, the librarian can take the opportunity of improving the learning resources and introducing the new tools, techniques and services so that the library can be presented as the resource center of the college. For the librarian, the participation in the preparation of SSR is an exercise in self-revelation, understanding the importance of library in teaching learning process and probably the first attempt at diagnosing the strengths and weaknesses of the present library practices. This will make the situation easy on the part of the college librarian to convince the college authority in introducing many innovation and healthy practices in the college library.

2.3 Validation of the SSR by NAAC Peer Team

To validate the SSR and to get a feel of the college, peer team visits are conducted. Some of the important reasons for undertaking the visit of the college by the peer team are:

- To validate the self-study report;
- To consolidate institution experiences;
- To receive feedback on the effectiveness of functioning;
- To create an internal motivation and focus;
- To provide statistics; and
- To make the college understand their inadequacies during the interaction with the peer team.

In addition to the validation of the SSR, interactions are held with the principal of the college, members of the governing body, teachers, librarian, non-teaching staff, alumni, parents and students. These interactions contribute to the evaluation to a large extent. The peer team makes judgment on the performance of the college in its totality by analyzing the information furnished in the SSR against the criterion statement and interaction with the stakeholders.

2.4 NAAC Criteria / Parameters for Assessment

NAAC has identified the following seven criteria / parameters, which encompass almost all aspects of the functioning of an affiliated / constituted college and serve as benchmarks. The assessment and subsequent accreditation is made with reference to these criteria / parameters so that the standing of a college can be compared with that of other similar institutions. There are different weightages for seven criteria, which are used for calculating the score of the college. The criteria and their respective weightages are furnished below:

Sl. No.	Parameters / Criteria	Unit of Assessment
1	Curricular Aspects	10
2	Teaching, Learning and Evaluation	40
3	Research, Consultancy and Extension	05
4	Infrastructure and Learning Resources	15
5	Student Support and Progression	10
6	Organization and Management	10
7	Healthy Practices	10
		Total : 100

First three criteria (Sl. Nos. 1 to 3) together carry 55% weightage and they relate to educational process of the college while the last four (Sl. Nos. 4 to 7) carry 45% weightage and they refer to institutional inputs or institutional support-structure needed to carry out the educational process.

NAAC indicators for seven criteria used in the 'Framework for Self-study' reveal the following :

2.4.1 Curricular Aspects [Total Score: 10]

This aspect deals with the mission of the college and its relevance and translation to the programme offered. The goals and objectives of the college should define its distinctive character and address the needs of the society and students it seeks to serve. It has to reflect both the tradition of the college and its vision for the future. The indicators for this criterion include

- Range of curricular options – that is, to see how the curriculum offers diversity and flexibility to students or to what extent curricular options available are: a) career oriented, b) academic skill oriented, and c) made relevant to the local and national needs?
- Contributions of the college in the curriculum design of the university;
- Periodicity of the review / revision of the curricula;
- Extent of incorporation of laboratory work, field work and projects;
- Innovative and interdisciplinary input;
- Social sensibility; and
- Mechanism of monitoring the implementation of the syllabus in the classrooms.

The incorporation of the project and fieldwork in the curricula and their implementation during the course of study calls for complementary support from the college library by providing required learning resources or information about them.

2.4.2 Teaching, Learning and Evaluation [Total Score: 40]

This criterion deals with the efforts of the college in providing appropriate teaching-learning experiences to learners. It also looks at the adequacy and competency of the faculty in handling the various programmes of the study as well as efficiency of the evaluation methodology of the college. The characteristics examined under this criterion include

- Modes of students' selection – i.e. transparent admission process, provision for

students from the same state as well as other states, NRI students and overseas students;

- Working days as well as teaching days in the college;
- Class size;
- Bridge / remedial courses to the educationally disadvantaged students;
- Tutorial system;
- Quality faculty—their academic and research eminence, attendance of national and international seminars;
- Faculty development programme by organizing seminars / workshops in the college;
- Teacher—Student ratio;
- Ratio of full time to part-time and ad-hoc teachers;
- Percentage of classes taught by full time teachers;
- Modes of teaching, its interactive and participatory character;
- Innovative teaching methods – use of AV and other teaching aids, extent of the use of IT in teaching—learning process;
- Self-appraisal method to evaluate the performance of the faculty in teaching, research and extension;
- Regularity of classes;
- Students' attendance in the classes;
- Mechanisms for evaluation of teaching and research as well as work satisfaction of the faculty;
- Budget provision for laboratories;
- Provision of departmental libraries;
- Collaborations / linkage with national and international institutions for teaching and research—MoU and other important details of such collaborations;
- Mode of evaluation – annual system / regular and continuous assessment / semester system / credit based system;
- Objectivity, impartiality and transparency in evaluation.

Interactive and participative character of teaching calls for the extensive use of the resources of the library by the students and teachers as an integral part of their teaching-learning programme. To make the teaching-learning process effective, the librarian of the college needs to take a number of initiatives like formation of departmental libraries/seminar libraries for the subject(s) taught at the Honours level. Other initiatives are mentioned in the later sections.

2.4.3 Research, Consultancy and Extension [Total Score: 05]

The emphasis is on the provision of research facilities in the college and its involvement in research, consultancy service and extension programmes. The characteristics examined under this criterion include

- Existence of committees (including their composition) relating to the research, consultancy and extension or outreach activities;
- Number of teachers attached with consultancy job;
- Expertise available for consultancy service – means to publicize them;
- Encouraging students and teachers to publish academic work;
- Research guidance and projects;
- Ongoing research projects and their total outlay;
- Research publications;
- Percentage of teachers engaged in research and publications;
- Number of teachers with Ph D;
- Awards and honors;
- Collaboration with NGOs for extension programmes like community development, health and hygiene awareness, adult education and literacy, AIDS awareness, rural development, environment awareness, organization of medical camp, blood donation camp and population education club;
- NCC;
- NSS;
- Publication programme (e.g. Newsletter).

Here, the college library can play its effective role in developing research profile of the college, directory of expertise available for consultancy service, and ascertaining the needs of the

locality so that extension programmes can be undertaken in the needed area(s). In collaboration with the faculty members of the college, the library can organise community information service, consumer information cell, human right information cell, etc. The library can also organize extension lectures on the topics of contemporary issues in collaboration with the NSS, NGOs and other external agencies.

2.4.4 Infrastructure and Learning Resources [Total Score: 15]

This aspect takes care on the adequacy and optimal use of facilities available in the college to maintain the quality of academic and other aspects of campus life. It also seeks information on how every constituent of the college, i.e. students, teachers and staff benefit from these facilities. The features addressed in this criterion are

- Adequate physical facilities to run the educational programmes and administrative functions effectively;
- Mechanisms for maintenance and optimal use of infrastructure;
- Master plan of the college – existing buildings and projected plan in the future;
- Use of academic facilities by external agencies;
- Central as well as departmental computer facilities;
- Development of computer aided learning packages in various subjects;
- Health services;
- Sports and physical education centres – facilities available;
- Workshops and centre for instrumentation – physical and infrastructure facilities available;
- Students' participation at university, state, regional, national and international meets;
- Hostel facilities and percentage of students having hostel accommodation;

Under this criterion more emphasis on the college libraries appears to be evident. Some important indicators are

- Working days and working hours of the library;
- Adequate library and computer facilities with easy access to all its constituents;
- Number of documents in the library – Books (textbooks and reference books), periodicals, AV materials (especially audio and video cassettes) and e-documents;

- Periodicals currently subscribed by the library – national and international;
- Linkage with other libraries for inter-library borrowing;
- Book Bank facilities;
- Computerization of the library activities
    a) Acquisition of library materials;
    b) Circulation work;
    c) Book Bank;
    d) Stock verification;
    e) others.
- Use of Internet;
- Use of INFLIBNET services;
- Reprography.

2.4.5 **Student Support and Progression** [Total Score: 10]

The highlights of this criterion are the efforts of the college to provide the necessary assistance for good student experiences in the college and to facilitate their progression. It also seeks information on student and alumni profiles. The information sought under this criterion are

- Availability of updated prospectus containing information about admission, course structure, fee structure, refund policies, financial aid and student support services;
- Sports and Game facilities;
- Academic counseling and placement services for students;
- Career guidance;
- Employment cell – its role in self-employment of students;
- Employment profile of alumni indicating prominent positions held by them;
- Financial aid to students from Central and State Governments and other sources;
- Drop-out rate – percentage of students appearing the qualifying examinations;
- Progression to employment and further study;
- Support services for NRI and overseas students (e.g. one window admission service, provision for special accommodation, induction courses, welfare programmes, police clearance, etc.).

The library can provide required support in the preparation of prospectus, career guidance

information and information on different schemes of self-employment for students and information support services for NRI and overseas students.

2.4.6 Organization and Management [Total Score: 10]

This criterion requires data on the policies and practices of the college in the matter of planning (both long term and short term), manpower requirement and training, performance appraisal, office and finance management. The characteristics examined under this criterion are

- Governance of the office and departments on the principle of participation and transparency;
- Academic calendar;
- Welfare schemes for teachers, staff and students;
- Grievance redressal cell;
- Effective resource mobilization and management strategy;
- Budgeting and auditing;
- Mechanisms employed to improve the organization and management (e.g. appointment of internal committee or external agency);
- Professional development programmes for librarian and other library staff;
- Professional development programmes for non-teaching staff;
- Inbuilt mechanism to check the work efficiency of non- teaching staff;
- Fee structure;
- Loan facilities for teaching and non-teaching staff;
- Procedure to purchase major items.

2.4.7 Healthy Practices [Total Score: 10]

This criterion focuses on the innovative and unique practices of the college that add to it academic ambience. Healthy practices may be different from college to college. Some examples are

- Sensitivity to changing educational social and market demands;
- Mechanisms for enhancement of internal quality checks;
- MoU with industries and research organizations;
- Linkages established by the college at the national and international levels for training and research;

- Strengthening regular academic programmes through other complementary systems like self-financing courses, non-formal mod and distance education;
- Value-based education;
- Inculcation of civic responsibilities;
- Personality development programmes for learners;
- Community orientation: participation in local community affairs;
- Promotion of information literacy (computer and Internet literacy) and communication skills;
- Promotion of learning skills;
- Campus cleanliness;
- Students' discipline;
- Feedback from teachers, librarian, students, non-teaching staff, alumni and guardians for improvement of the functioning of the college;
- Generation of own resources / fund by the college (e.g. self-financing courses, fund raising drive, donations, alumni association, consultancy, etc.).

2.5 Accreditation

After validation of the SSR, the peer team prepares its final report in the college itself. The report is given to the principal for his / her confirmation. The principal may agree with the report or may separately record objections or amendment to it. The final report provides a fairly good idea of the grade that the college is likely to receive. From April 2002, NAAC has changed over from the star-rating system to the following grading system:

Score	Grade
95 – 100	A ++
90 – 95	A +
85 – 90	A
80 – 85	B ++
75 – 80	B +
70 – 75	B
65 – 70	C ++
60 – 65	C +
55 – 60	C

The seven criteria have a collective score of 100. In order to get the 'accredited status' a college is required to score at least 55%. Any score less than 55% will lead to 'not accredited status'. The grade of the college is based on the percentage score obtained cumulatively against the seven criteria. The score of the college is worked out by using the following formula:

$$\textit{College score} = \frac{\underline{WiCi}}{Wi}$$

[Where i = Criterion, i.e. 1, 2,...,7; Wi = Weightage of the ith criterion; Ci = Score obtained on the ith criterion]

After departure from the college, the peer team places its final report before the NAAC. The Executive Committee of the NAAC takes the final decision on assessment and accreditation of the college.

3 Preparation of College library for Assessment by NAAC

A college library is expected to serve the needs and requirements of the teachers and students in reading, study and research. This can be achieved if adequate resources, facilities and services are made available. In order to determine how far the college library is succeeded in achieving its objectives, one should determine the extent to which the students and teachers use the resources of the library as an integral part of the teaching-learning programme. The concept of resources is concerned with not only the print and non-print media, but also with the linkage with the resources of other institutions by taking the advantage of information and communication technology (ICT). Growing impact of ICT demands that college libraries of today should be able to harness ICT so as to ensure optimum utilization of library resources. Multimedia, CD-ROM, online information retrieval systems, information and library networking, and the Web via the Internet are the buzz words of today and the college librarians must be equipped with the ICT related tools and techniques of information handling to tackle the challenges enforced upon them by the technological revolution. Under this objective condition, college librarians need to understand the perspectives of the assessment and accreditation of the collegiate education by the NAAC.

It would not be out of context to mention a meta evaluation carried out by the NAAC through a survey to ascertain the assessors' views on their field experiences. Amongst the areas where the peers found a large mismatch between the SSR and on-site visits for the validation of the SSR were 'Quality of Instruction' and 'Library and Learning Resources'. A total incounsurgence between the SSR and the visits was reported by most of the peers in these two areas. Regarding 'Quality of Instruction' peer team members often remark that: "...the output,

i.e. pass percentage may be high but the transaction of curriculum *per se* remains orthodox. In many institutions, dictation of notes at UG level is still prevalent and methods of assessment are only summative. As a natural consequence, library and learning resources are in many places confined to text books and a few reference books". Extending working hours of the library, its automation and transforming it to a resource centre for providing effective services to its clientele are some of the suggestions made by peers to the institutions.

While discussing NAAC criteria for assessment of the colleges under section 2.4 and its sub-sections, the important role of college library as an essential input to quality education has already been mentioned. As against the above, the college librarians need to consider the following aspects to get themselves prepare for NAAC assessment:

3.1 Preparation of Library Profile

The librarian should prepare a library profile incorporating following items. It should be presented before the NAAC peer team at the time of their visit in the library.

1) History of the college library;
2) Purposes / Functions;
3) Management of the Library—Library Committee and its composition;
4) Profile of Library staff: Name, Designation, Qualification, Date of joining, etc.
5) Book and periodicals Selection Policy;
6) Collection: Print and non-print media including e-documents, if any; Subject-wise number of collection; Reference Books; List of journals subscribed;
7) Layout of library building / room(s), floor area, collections, etc; Location of various sections and services;
8) Shelf arrangement;
9) Schemes of classification used: its features;
10) Catalogue code followed;
11) Library hours;
12) Services provided;
13) User Education Programme;
14) Library Members;
15) Borrowing Facilities;

16) Book Bank Facilities;

17) Reading Room Facilities;

18) Linkage with other libraries for inter-library borrowing

19) Computerization of Library—Number of computers and their specifications in terms of hardware and software; Extent of computerization, Use of Internet;

20) Use of INFLIBNET services;

21) Publications, if any;

22) Future projection;

23) Other highlights, if any.

3.2 Preparation of a booklet for initiation of freshmen

This booklet may be entitled as 'Know Your Library', will serve as a guide to orient the new entrants in the college about their college library. The items of information to be incorporated in this booklet are same as mentioned under section 3.1, except serial numbers 3—5 and 22. But it should be brief and precise. In addition to above, the following items of information should be included: (i) How to use catalogue and how to find out book with the use of catalogue; (ii) Classification number representing broad subjects and arrangement of subjects; and (iii) Important library rules.

3.3 Library Rules

There should be printed library rules in the college. Some significant items in the library rules are

- Library Hours: Working days and working hours of the library, Timing for issue and return of books;
- Membership /Admission to the Library;
- Reading Room;
- Book Bank;
- Borrowing facilities
  - — Students, Teachers, Non-teaching Staff and Alumni;
  - — Library Cards;
  - — Loss of Library Cards;
  - — Conditions of Borrowing (including inter-library borrowing);

— Renewal;

— Discharging;

— Book Reservation;

— Recovering overdue books

- Lost or damaged books.

3.4 Guiding by Signs and Boards

1) At the entrance / gate of the library, there should be a board containing the name of the Library with opening hours;

2) Shelf guide, section guide, etc.(e.g. Circulation Section, Periodicals, How to use Catalogue) are to be provided at the appropriate places in the college library.

3) Lay out of different sections of the library

3.5 Computerization

It is evident that NAAC put much emphasis on the computerization of college libraries. In the X Plan UGC has proposed to establish 'UGC Network Resource Centre (UGC—NRC)' in colleges, where assistance would be provided for the purchase of computers and also for Internet connectivity. The objective of the scheme is to create awareness among the college community about the use of the computers in various activities like administration, finance, examination, teaching, learning and research. In addition to it, the UGC—NRC would help the colleges to have an access to multimedia materials in teaching, learning and research. Apart from this college libraries also come under the purview of INFLIBNET programme. Some colleges have already initiated the work of computerization of their libraries. It is also understood that some colleges have proposed to install the Internet facilities in their libraries and different departments of the college have been proposed to be interlinked by LAN. It is to be noted here that while selecting the software for library work the question of compatibility is most important consideration. It is suggested to opt for WINISIS software since it is available free of cost and is compatible with the SOUL, a software developed by INFLIBNET.

3.6 Routine Jobs

The college librarian should take care of the routine jobs like book selection, book ordering, Acquisition including accessioning, bill payment, periodical subscription and renewal, classification and cataloguing of books using standard cataloguing code and classification scheme, binding, stock verification, withdrawal of lost, damaged and outdated books, and cleanliness within and outside the library.

4 Conclusions

One may ask, is the atmosphere really developed for assessment and accreditation in our colleges? As the qualities expected from college libraries are also expected from colleges. Methods of teaching followed by the faculty in most of the colleges and attitudes of the faculty towards the role of library in teaching-learning process are not at all conductive to the improvement of college library services. Computerization of library is yet to take off in most of the colleges. In order to make college libraries to play an effective role in the collegiate education, the heads of colleges need to set examples. They need to organise classroom instructions in such a way that can boost the spirit of 'library-centered education'. It is also to be pointed out here that many college librarians are not sincere in discharging their professional duties. Thanks to NAAC! The motive behind NAAC assessment is ardent desire to improve the current situation in higher education. It is expected that the college librarians will take full advantage of this situation. Because of the compulsion for NAAC's periodic review every five years, the college libraries will expand their limited objectives and come forward to play an effective role in the improvement of the quality of higher education.

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Technical Writing : An Overview and New Scope for Library Science Students

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Abstract

The electronic form of Technical Writing (TW) with Internet protocol allowing the global exchange of information and opportunities exists for the field of TW in a technological information age. But most of the students and academicians may not much aware about this area. This article provides an effort to highlight and over view about TW, its tools and techniques.

0 Introduction

Over the last decade new media and communication technologies have permeated both the 'Technical Writing' (TW) classroom and the TW workplace. The two contexts, 'the document written for' and 'the document used in' are no longer include into just verbal text message and simple print on paper. Today it appears not only in print but also in electronic form include multiple media like high resolution graphics, audio, video, animation and other visual effects [1]. Hence, TW has brought a global chalenge and new task before the diverse professionals in the arena of technical communication in multiple media and forms.

Every professions have it's own specialized form of writing. Doctors, company executives, managers, police officers write specialized reports and someone has to learn, perform, critique and teach each one. Somebody has to design tax forms and the accompanying instruction books, assembly instructions for toys, and scripts for product demonstrations or multimedia presentation [2].

We are living in an information age. People now believe that information can be manufactured in the sense it must be produced in a format that is usable to a growing number of people [3]. TW plays a crucial role in the presentation of these information to ever expanding audience. The traditional approach of TW mainly indicates to write special kind of text. Those texts are different from writing a novel or poem or answer in an examination. The basic examples of TW are 'letters writing', 'form writing', 'article writing', 'speech writing' and most important TW was 'report writing'. Those writings follow some standard format with deep concentration of English grammar

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and language. But computer have encouraged many changes in the present way of TW. It goes more dynamic in nature. Those traditional activities are enhanced by computers, which are used to structure working and learning environment in which invention, collaboration, and production activities are fully supported by sophisticated computer programs specially developed for TW and communication tasks. People involved in TW now need not much worry about grammatical mistakes, language or sentence structures all these are performed by softwares. The new job opportunities reflect the nature of today's TW are diverting to make 'user manual', 'product documentation', 'software help manual' etc. This article will try to provide an over view of what is TW, fundamental mechanism to write a technical document and the changing scenario with modern tools and steps to write a TW.

1. What is Technical Writing (TW)?

There is no definition of TW as such. This is an attempt to make user understand what is TW?

- **"Technical"** comes from the Greek ***techne,*** which **simply means "skill"** so TW is a document written with skilled knowledge. It needs more practice than intelligence.
- Technical writers present information about a product or service to the people who use the product or service. Technical writers produce user manuals, web pages, online help, graphics, and more. The manuals one gets with software, or the books those come with cars? Both written by technical writers [4].
- Technical writing is any writing that is geared toward technical and scientific audiences. In general, technical writers create text for labs, offices, and factories. They write memos; instructions, procedures, lab reports, formal reports, manuals, articles for publication, and grant proposals. Today technical writing is not limited to writing on a printed page. Technical writers now must be able to produce written documents, videotapes, slide shows, and a bevy of electronic messages [5].
- Technical writing involves the production of easy-to-use information, usually from complex, hard-to-understand source material. The resultant technical writing product can be internal (for use within the company) or external (for customers).

1.1 Example of TW

- Instructions, Directions - for operating a machine or performing as task
- A description of a process - operating or manufacturing
- Company Policies/Procedures

- Memos, Business Letters
- Monthly/Yearly Activity Reports
- Proposals, Feasibility Studies
- Summaries of Staff or Team Meeting
- Brochures, Commercial/Advertisement, Job Descriptions
- Annotated bibliography
- Annual report for a large organization
- Cover letter for an engineering position advertised in a college alumni bulletin
- Follow up letter sent after an interview for an accounting job
- Literature review
- Memorandum
- Progress report etc.

2. Basic Objectives

In all technical writing work, the writers must remain aware of two important elements: audience and purpose.

- **Audience :** Who are the readers of the document? Are they **generalists, managers, operators, technicians, specialists, clients, customers, consumers?** What are the readers' positions relative to the writer? What are the readers' needs? Is the document going lateral, upward, or downward?
- **Purpose :** What is the purpose of the document? Is it to inform, to educate/train, to recommend, to persuade, to sell, to increase reader interest? How do you want the readers to respond to the document?

2.1. Audience

Technical writing, like any other form of effective communication, requires knowledge of the audience, how much they already know about the subject, and their level of expertise. Before writing a technical piece, the writer should determine the following about the various readers:

- Is the document INTERNAL or EXTERNAL?
- Who is the primary reader? What type of reader is this person?
- Should the tone be formal or informal?

2.1.1 Types of Readers

General : For this audience the writer should

- minimize jargon or add explanations,
- provide familiar comparisons,
- limit or eliminate formulas and equations.

Managers : For this audience the writer should

- minimize jargon and lengthy explanations of theory,
- direct attention to recommendations and conclusions (often stated in the introduction),
- provide background information but place it where it does not hinder smooth reading,
- focus on providing details for a decision maker.

Operators : For this audience the writer should

- use short sentences and standard English so the operator can perform the task as he/she reads it,
- include tables, charts, and graphs when math is a part of the process so calculations are not necessary,
- provide all necessary information in the document so a second reference source is not necessary.

Technicians : For this audience the writer should

- include background information and some theory,
- provide definitions and explanations of technical jargon,
- include tables, charts and graphs but keep complex mathematics to a minimum.

Specialists : For this audience the writer should

- use shared technical jargon, but provide definitions when necessary,
- provide theories, mathematical equations, and supporting data,
- refer to additional resources, studies and readings.

2.2 Purpose

- To Inform without decision making-bulletins, product descriptions, annotated bibliographies, instructions, process documents, causal analysis reports.
- To Recommend by providing information and suggesting action-proposals, feasibility studies, recommendations.
- To Persuade by providing recommendations toward a specific action or conclusion.
- To Interest or Sell by satisfying curiosity-brochures, pamphlets, handbills, magazine and journal articles.

3. Mechanism for TW

3.1. Manuscript Form

Much of the time, technical writing does not demand any special manuscript form. In such cases the following general instructions should prove sufficient [6].

1. Ordinary manuscript should be typed on one side of 8½-by-11-inch white paper of good quality. Double spacing is usually preferable between two lines. Though single spacing within two lines with double spacing between paragraphs is standard in letters and often desirable in reports.
2. The margin at the top should be 2 to 2½ inches on the first page and 1 inch on other pages. Other margins should be: left, 1 inch; right, 3/4 of an inch to 1 inch; bottom, 1 inch. If a manuscript is to be bound at the side, the left margin should be increased by 1/2 or 3/4 of an inch. If it is to be bound at the top, the top margin should be increased to 2 inches.
3. The beginning of each paragraph should be indented five spaces.
4. Unless a separate title page is used, the title of a paper should be placed on the first page, centered on the first line. It may be entirely in capital letters, or, if the author's name does not follow, may be underlined and written in upper and lower case (capital letters to begin each important word).
5. If the name of an author accompanies the title, it should be centered a double space below the title and should be upper and lower case. There should be three or four blank spaces between it and the text.
6. The page number is ordinarily placed in the upper right corner of each page except the first, from which it is omitted. If a paper is bound (not clipped) at the top, however, the page numbers should be centered in the bottom margin.
7. Long quotations (75 words or more) should be single-spaced except for double spacing between paragraphs. Margins adjoining such quotations should be increased by 1/2 to 3/4 of an inch on each side.
8. Ordinarily, manuscript should be fastened together by means of paper clips or not at all, and should not be folded. Occasionally, however, especially when it is placed in final, permanent form, it should be semi-permanently fastened in a cover that opens at the side, or provided with backing paper and stapled together at the top.
9. Manuscript to be submitted for printing should never be fastened permanently. In such manuscript, illustrations should not be attached to the copy. Rather, an identifying number should be written on the figure's back and a note should be inserted in the manuscript to indicate where the figure belongs.

3.2. Technical Style

3.2.1. Use of Figures or Words for Numbers

3.2.1.1 Numbers in Ordinary Style

The basic rule in ordinary writing is: If a number can be expressed in no more than two words, it should be written out. Otherwise, it should be expressed in figures. Examples: four, seventeen, twenty-seven, one hundred, one thousand; but 114, 1198, 14,456.

There are many modifications to this rule, the most important of which follow:

1. Figures are never used at the beginning of a sentence. Such numbers must be written out, or else the sentence must be changed so it does not open with a number.
2. All numbers in a series are written in the same form-preferably in figures if any number in the series is long enough to call for use of figures.
3. There are many special uses in which figures may or should be used regardless of the size of the number. These include degrees of latitude and longitude or of temperature, prices, scores, time of day, dates, and tabular statistics.
4. For extremely large numbers a mixed form is widely used which is extremely easy to write correctly and to read accurately. Examples: 50 billion, 125 million, 6.4 billion.

3.2.1.2. Numbers in Technical Style.

1. In technical style, 10 and all numbers above are expressed as figures. Any number below 10 is written out, except as mentioned below.
2. In technical style, a number that precedes a unit of measurement is written as a figure even if it is below 10. Examples: 6 inches, 4 hours, 8 cubic yards; but six hoes, three stories, eight gusset plates, four arches.
3. In a passage where numbers are especially frequent, all numbers may be expressed as figures. Example: He used a crew of 3 carpenters, 1 plumber, 6 laborers, 1 foreman, and 1 timekeeper. This is particularly desirable when statistical information is being presented.
4. When one number appears immediately after another as part of the same phrase, one of the numbers is spelt out. Examples: 7 six-inch timbers, two 7-man crews. It is preferable that the shortest number be spelt out; but when two such terms are close together, the same form should be used for both.
5. Sums of money are expressed in figures. Examples: 5 dollars or $5, $7.95, $0.80, or perhaps 80 cents.

6. Technical style tends to use decimals rather than ordinary fractions because they make it possible to indicate a greater degree of precision. In a decimal fraction with a value less than one, a zero is placed before the decimal point (0.719). Also, it may at times be desirable to add a zero after the decimal point for the sake of precision (0.6840).
7. Decimal fractions should not be used to express information for which ordinary fractions are customary, especially when accuracy would thus be misrepresented. For example, 2.812 inches should not replace 2 13/16 inches, since this measurement is not accurate to the thousandth of an inch.

3.2.2. Use of Abbreviations in Technical Style

Abbreviations are used more frequently in TW. The Technical Writers follow some rules to use abbreviation ,like below:

1. Unless it is extremely short, a term denoting a unit of measurement is abbreviated when it follows a figure. Examples are inch, yard, pound, ounce, gallon, cubic yard, revolution per second, watt, board foot, and horsepower. Unless it follows a figure, however, none of these terms is abbreviated. One would write 63 ft, 2300 rpm, 25 hp, 50 cc etc.
2. An abbreviation for a unit of measurement is always shown as singular. One should use lb, not lbs; bbl, not bbls; gal, not gals.
3. A few extremely short terms denoting units of measurement are not abbreviated. Among these are day, mile, and acre. Since usage is not consistent, no exhaustive list can be given. Systematic personal observation is the only way to be sure about the customs in your own intended profession.
4. In many professions there are terms in addition to units of measurement that are used with extreme frequency and consequently are abbreviated for example: a-c for alternating-current used as an adjective, F and C for Fahrenheit and centigrade, cp for chemically pure, el for elevation, emf for electromotive force.
5. The fact that technical style permits the use of abbreviations does not mean that it is desirable to use arbitrary signs for words. Technical writers write 8 in., not 8″; 12 by 15 ft, not 12′ × 15′; percent, not %.

3.2.3. Use of table

For TW, the following suggestions are offered to use tables:

1. At the top of every table there should be a title-preceded by a number if more than

one table is used. Numbers of tables are sometimes Roman numerals but more frequently Arabic.

2. Unless a table is merely supplementary and is placed in an appendix, it should be referred to in the text so that the reader will know when to give his attention. Reference to a table may be desirable even if the table is in an appendix.
3. Each table (unless tables are relegated to the appendix) should be placed where it is conveniently accessible at the proper moment. Ideally, a table should be placed shortly after the point where it is first referred to-always on the same page if there is room for it. Under no circumstances should a table be placed very far in advance of the point where it is referred to or discussed.
4. The form of tables varies in detail as necessitated by the material to be presented.
5. Regardless of other details of form, each column should have a heading that shows accurately the nature of the contents below. If there is not enough room for the essential information in a column heading, part of it may be added to the table in notes.
6. A table should indicate all the factors that affect the data it contains.
7. Standard symbols and abbreviations may be used to save space.
8. Figures in columns are usually aligned under similar digits-ordinarily the right-hand digit.
9. When a note is needed to explain some part of a table, its presence is indicated by a lower case letter raised half a space above the line at the point where the note applies. The notes applying to a table are placed at the bottom of the table, rather than at the bottom of the page where they might be confused with ordinary footnotes.
10. No table should continue from one page to another unless continuation is unavoidable because the table is more than a page long. When such is the case, continued or cont. should be used at the bottom of the first page to indicate that the table has not been completed, and at the top of the second page to indicate that part of the table has preceded. Column headings must be repeated on the second page. If totals are to be indicated at the bottoms of columns, the subtotals should be at the bottom of the first page and at the top of the second page. The word forward should be used at the left side of the subtotals, to show that they are not final totals.
11. A table from an outside source must be acknowledged, as one would acknowledge any other borrowed material. This may be done by naming the source in parentheses after or under the title, or by use of a footnote.

3.2.4. Use of figures

For TW, the following suggestions are offered to use figure:

1. Number and caption: Every figure should have a caption, which should be preceded by a number (usually Arabic) if more than one figure is used. It is usually best to use a single sequence of numbers even when figures differ in kind.
2. Spacing of the caption: When the caption is underneath the figure, there should be at least a double space between the figure and the caption.
3. Reference to the figure. Every figure, unless it is purely supplementary and is placed in an appendix, should be mentioned in the text.
4. Placement of the figure in the text: Any figure in the text should be placed, if possible, almost immediately after the point where it is first mentioned. Certainly it should not come very far ahead of that point.
5. Drawing the figure: The figure should not extend into the margins of the page.
6. Acknowledgment of source: If a figure is taken from an outside source, the source must be acknowledged.

3.3 Basic styles [7]

- Third person voice is preferred for technical writing. Avoid using "we" or "I".
- Be as specific and simple as possible. Use simple sentence construction. Identify nouns with specific names. Take advantage of labels on equipment diagrams. Define terms, which may be unfamiliar to your reader, or leave them out. Condense your report, sentence-by-sentence and paragraph-by-paragraph.
- Use present tense most of the time. The design and ideas exist in the present as a collection of information. Use past tense to describe experiments already done, buildings already built, etc. Be cautious in describing the future.
- Be quantitative. Avoid using "a lot", "very", "much", and "significantly". Use descriptions like "fifty per cent larger" or "within one standard deviation of the mean".
- Be careful with words like "today" and "recently". It may not be recent if your reference is a few years old.

These are the basic mechanism of TW. Apart from these there are so many rules and regulations to be followed to write a good technical document, which can be grown up by practice.

4. Tools for Technical Writing

Writing, editing, and design skills are the foundation of technical writing. Apart from these technical

writers need to know how to use publishing programs, help authoring tools, web design, and graphics packages [8].

There are four types of programs that new technical writers need to know:

- ➤ Publishing Tools
- ➤ Graphic Tools
- ➤ Help Tools
- ➤ Web Tools

A "working knowledge" of specific software tools is the minimum requirement for most jobs now a day. Realistically, you need to be an expert user of at least one major product and familiar with some of the others.

4.1 Publishing Tools

Though technical writers write online help systems, design web sites, and deliver multimedia training — publishing programs are the basic tools of the industry. There are few jobs for people who do not have an expert understanding of at least one or more of these programs. In any advertisement of TW one can find out the requirements of some software knowledge like below.

FRAMEMAKER [http://www.adobe.com/products/framemaker/main.html] Adobe FrameMaker is the most requested tool in this industry.

MS-WORD [http://www.microsoft.com/office/word/default.asp]

Love it or hate it, MS Word is second in job ads. Though not a true "publishing" program, it is a good word processor in spite of its bugs. It is the basic need and maximum choice for writing and editing text.

INTERLEAF [http://www.interleaf.com/products/defautl.htm]

Not really common, but important extensive XML/SGML authoring suite—very expensive.

ARBORTEXT [http://www.arbortext.com/]

Another top-end XML/SGML authoring program.

ADOBE PAGEMAKER [http://www.adobe.com/prodindex/pagemaker/main.htm]] Used mainly for smaller documentation projects, but great graphics and layout features.

4.2. Graphics Tools

Techwriters are not expected to be professional graphic artists, but they are expected to

understand basic graphics. If one plan on documenting any type of software, he/she needs to know how to do screen captures and edit them for use in a manual or Help screen.

ILLUSTRATOR [http://www.adobe.com/prodindex/illustrator/main.html] The most popular software for technical illustration.

COREL DRAW [http://www.corel.com/products/graphicsandpublishing/draw9/main.htm] One of the more popular drawing programs.

ADOBE PHOTOSHOP [http://www.adobe.com/products/photoshop/main.htm]] Undoubtedly the best and most popular photo program in the world.

4.3. Help Authoring Tools

You need to learn at least one Help authoring program if you plan on documenting software and TW. The example and widely used authoring softwares are —

ROBOHELP [http://www.blue-sky.com/]

RoboHELP is the most requested help tool in advertise of TW.

FOREHELP [http://www.componentone.com/fflhelp/ff.htm] ForeHelp is also seen in advertise, and one of the few that works independently of Word.

4.4. Web Design Tools

There are a couple of softwares and markup languages, scripting languages that one should be highly familiar with, to be a good technical writer. The foremost thing one need to understand is Hyper Text Markup Language or HTML. If one really wants a Webmaster job, he'll need to know Active X, CGI, DHTML, HTML 4, Perl, Java Script, and more.

The examples of some popular web design tools are :

FRONTPAGE [http://www.microsoft.com/frontpage.htm] Front Page is the most requested software. It does write some proprietary code, reduce an enormous time and headache to write HTML code.

COLDFUSION

Now a days high demand in advertise of TW and it goes beyond any techwriter's needs.

DREAMWEAVER [http://www.macromedia.com/]

A great alternative to FrontPage. This is one of the most powerful web designing tool.

There is no end of softwares which are marginally different to each other of one category. But above are the few examples which really very essential and helpful for today's technical writers.

5. Steps to Good Writing

5.1 Prewrite

There are no rules except to begin writing and write whatever comes to mind. If the mind drifts, let it drift for a while, but bring it back to the focal point. Some writers prefer to create formal outlines. Others like to make lists. Some proceed immediately to sentences and paragraphs. No single format is better or worse than any other. The only purpose is to get started.

After an initial start, but before proceeding to the writing stage, a writer should review the prewritten material, rip out what is useless or immaterial, organize what remains, and add more focused details. This is also the point in the writing process to begin looking at Audience and Purpose.

The most important thing to remember is to "stay loose." This is still the Prewriting stage where ideas are formulated, developed, modified, or even rejected. Bouncing an idea off of another person, soliciting feedback, and asking for help from a collaborator or co-conspirator can resolve early difficulties and move the writing process to the next stage.

5.2. Write

Like the Prewriting stage, there is no magic and waiting for inspiration is a hopeless waste of time. Instead, the technical writer takes the material generated by the Prewriting and composes a first draft of the document. The focus at this stage is to establish strong Ideas, impose an Organization upon the material, choose the appropriate Wording, and bring an individual and personal Flavor to the material. Using the Planning Sheet in conjunction with the first draft and as a check-point in subsequent drafts can help keep the writing focused.

5.3. Proofread & Edit

A first draft is not a final draft, editing a draft is not a synonym for ego mutilation or bodily dismemberment. Good writers will confess that the first sentence and often the entire first paragraph they write is not worth saving. Good writers also know they make types and other errors that, if not caught in the proofreading stage, are a real embarrassment. So they use Proofreading & Editing as an integral part of the writing process. Proofreading is the simpler of the two and involves a read through of the document to check for spelling, grammar and technical problems. Nothing should be passed on to a primary or secondary reader before a careful Proofreading is completed.

5.3.1. Step One

Read the document through completely looking at continuity and flow of ideas and wording.

Digital Library Initiatives in India: An Overview

*Partha Bhattacharya**

Abstract

The digital library is a socio-technical concept of great significance. The paper has attempted to trace the digital library initiatives in India. Some very important digital library initiatives in India, such as Traditional Knowledge Digital Library (TKDL), Gyandoot, Digital Library Initiatives projects at IITs, IIS, IGNCA are highlighted in detail. The paper also dwels on the problems facing the digital library initiatives in India. Some suggestions for the improvement of Digital Library development in India are mentioned. The paper has also attempted to trace the history of digital library development in developed countries.

Introduction :

The rapid advancement in electronic information technology has resulted in the new methods of communication. The explosive growth in network connectivity and rapid advances in computing power systems have altered the speed of communication. These changes have affected the way in which information is handled, stored and exchanged across the world. These advances have transformed libraries from storehouse to powerhouse of information, which desired the library professionals to switch over from Traditional Library system to Digital library (DL) concept. The DL is a new concept that has appeared worldwide since last decade. The digital library is a socio-technical concept of great significance. It redefines the relationship between information providers and intermediaries and potentially, transforms the way that services are delivered to users. The basic idea of DL is to provide universal access to digitized information throughout the world. DL is a common place, where in any educational institution users, researchers, and educators can have access to their required information at their work place itself.

Definition of Digital Library: The term 'digital library' is a source of much debate and confusion. The term "digital" is actually somewhat of a misnomer. Digital libraries basically store materials in electronic format and manipulate large collections of those materials effectively.

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The Association of Research Libraries (1995) one of the leaders in collaborative digitization programme in US assigns following tenets to a digital library : (i)The digital library is not a single entity; (ii) The digital library requires technology to link the resources of many; (iii) These links are transparent to end –users; (iv) Universal access to the digital libraries and information services is the goal; and (v) digital library collections are not limited to document surrogates, they also include digital artifacts that cannot be represented or distributed in printed formats.[2]

Terence R.Smith (1997), defined digital libraries as " controlled collections of information bearing objects(IBOs) that are in digital form and that may be organized, accessed, evaluated and used by means of heterogeneous and extensible set of distributed services that are supported by digital technology".[15]

Clifford Lynch (1995), a well-known expert on Internet and Web technologies, defined digital library as "system providing a community of users with coherent access to a large, organized repository of information and knowledge. The digital library is not just one entity, but multiple sources that are seamlessly integrated".[11]

It is critical that digital libraries provide an organized and structured access to information contents in a distributed environment and assist users in searching, evaluating and utilizing resources irrespective of their format. Digital libraries combine collection and expertise in a seamless interface, and therefore require specialized staff to select , organize, evaluate, interpret, offer intellectual access, preserve the integrity and ensure the persistence over time of digital works so that they are readily, and economically available for use by a defined community or set of communities. (*Waters*, 1992).[20]

Digital libraries are multimedia products incorporating structured text, sound, graphics, pictures, photographs, video clips, etc., which require intensive use of bandwidth. Moreover, the "last mile problem" that every user has in every country is much more intensive in developing countries like India. The term DL in a broad sense is a computerized system that allows users to obtain a coherent means of access to an organized, electronically stored repository of information and data. The DL is an electronic library consisting of information in the digital, analog and digitized form. The digital resources are the information existing in the form, which the computer can store, organize and display without any intervening process. The analog materials are information in any formats, viz. print, microfilm, video recording etc. which requires an intervening conversion process before a computer can store, organize, transmit the information and the digitized one describes information of any type which has been transformed from analog source to a digital

form. Digital libraries are basically decentralized and easily extensible, able to support interoperability between tools, applications and systems; support heterogeneous both in terms/ forms of data and systems/tools supported; able to support a rich information seeking environment and scaleable in terms of the size of the system (user tools, information). Digital information may include digital books, scanned images, graphics, data, digitized A-V clips, etc.

Objective :

The objective of this paper is to study the historical development of digital libraries, major digital library initiatives in India, the types of organizations taking the lead role in developing the digital libraries both at the Government level and other levels. This article also explores the types of digitization programmes being undertaken by these organizations and the problems facing the digital library development in India.

Historical developments of Digital Libraries :

Although the term digital library has gained popularity in recent years, they have evolved along the technological ladder for the past thirty years. In early 1970s, the digital libraries were built around mini and main-frame computers providing remote access and online search and retrieval services to users using computer and communication technology available at that time. The earliest application of digital library concepts involved character –coded storage and full – text indexing of legal and scientific documents. Several software packages were released during mid 1970s and late 1970s for computer-based storage indexing and retrieval of documents in character-coded form. By the late 1980s, text storage and retrieval programs were available from dozens of vendors for major computing environment including main-frame, microcomputers and LAN.

Sophisticated information storage and retrieval systems were built during 1980s using state-of-the–art technology of distributed database management system linking different remote systems. These online information retrieval services used datafiles generated in the process of electronic phototype setting of printed abstracting and indexing services and other primary Journals. As such, online hosts like DIALOG and STN were not only offering online databases but also full-text online journals for past several years although as a simple ASCII or text-files without graphics and pictures. In 1989, there were almost 1,700 full text sources in sixteen online systems. Availability of CD-ROM in late 1980s, as a media with high storage capacity, longevity, and ease of transportation triggered production of several CD-ROM information products which were earlier available through online vendors or as conventional abstracting and indexing services in printed format. Moreover, several full-text databases also started appearing,

in late 1980s and early 1990s launching the beginning of digital era. Some of the important full-text digital collections available on CD-ROM include: ADONIS, IEEE/IEE Electronic Library(IEL), ABI/INFO, UMI's Busines Periodical ondisc and general Periodicals ondisc, Espace world, US Patents etc.

Digital document imaging systems which employ, computer hardware and software to scan and store images of documents in digitized formats, were evolved in early 1980s to overcome the limitation of text storage and retrieval systems which could only store textural information. The earliest application of a document imaging system was the " optical Disk Pilot Project " at the Library of Congress. Several document imaging software packages are currently available in the market. OmniDoc(Newgen) and Datascan(stacks India) are two important document imaging software from India. The beginning of full text digital library involved building-up several client systems usable in a multitude of environments, such as MS Windows, MS DOS, Apple Macintosh and a diversity of UNIX systems as well as for terminal-oriented mainframe systems, notable VT-100 and VT-220. Upscaling of digital library in those days entailed huge maintenance problems because all client system had to be upgraded and scaled for new facilities and emerging new techniques and processes.

1990s brought in a true revolution in digital library system. The advent of World Wide Web (WWW) offered a crucial advantage with the availability of ready-to-use publicly available, user-friendly graphical web browser for all prevalent platforms. Standard WWW clients such as Netscape Navigator and Internet Explorer are being upgraded regularly for added functionality such as e-mail client, support for Java and Active X and the ability to view important document formats without having to install plug-ins for them. These browsers solved the maintenance problem allowing developers to concentrate fully on the server side and not to bother with the client side. These browsers are available freely and are easy to use eliminating the need of extensive support and user's training. The Internet and associated technologies made it possible for digital libraries to include multimedia objects such as text, image, audio and video. These Internet and web technologies thus brought in the graphical components in digital library which was missing in earlier digital library implementation. There has thus been a steady move up the technological scale for the digital libraries from early (late 1980s) low-end electronic publications available as ASCII files, being organized and searchable on gophers (1992), and to being tagged and graphically viewable on World Wide Website (1994). One reason for the recent growth of electronic journals is the convenience it offers due to the availability of the Internet and web technology as a media of information presentation and delivery.

Material for digitization : The following materials are available for digitization : (i) Books;(ii) Back issues of journals; (iii) Theses, technical reports; (iv) Manuscripts/oral knowledge/ ancient texts; (iv) Newspapers; (v) Maps, air photos; (vi) Government Records & Publications; (vii) Pictures/Paintings; (viii) Photographs; (ix) Audio tracks; (x) video tracks

DL initiatives in India :

The digital library development in the developed countries started during 1970's; however in India it has started late. The development in India started during mid 1990's with the advent of information technology (IT) on a large scale and also by the support extended by the Central government

The advent of internet acted as a catalyst towards the digital library initiative. The basic objectives of digital library initiatives in India has been to preserve the art, culture and heritage of this country. All projects aimed at creating digital libraries concentrate only on specialized collection. The DL initiatives in India is still at a nascent or embryonic stage. The concept was recognized in India during the Fifteenth Annual Convention and Conference on Digital libraries, organized by the Society for Information Science at Bangalore from 18-20 January 1996. Though, here and there, a few libraries had made attempts in this direction earlier also. Only sporadic & partial attempts have been made towards digital library initiatives. It has been noticed that over simplistic approach has been made in the libraries such as; to get few databases on CD; subscribe to few e-journals; scan few documents; create pdf files & install these on an Intranet. The scenario on the Indian horizon is changing at a snail's pace; but it has to gain momentum to survive in the competitive world. Attempts have been made in this paper to categorise the DL initiatives in India into the following eight categories.

- Initiatives at the National Level
- Initiatives at the University level
- Initiatives at the R & D organisation level
- Initiatives at the NGO level
- Initiatives at the Media level
- Initiatives at Private level
- Initiative at Government level
- Initiatives at other levels not listed in the above categories

A few examples from each of these categories listed above have been taken to assess the digital library initiatives in India.

Initiatives at the National level :

National Institute of Advanced studies(NIAS), Bangalore :

They have created WEBOPAC for access by their staff. The various papers, lectures, Reports etc which are available in their library for purchase are listed on the web. The bibliographical details of publications by the staff are also available on the web.

National Institute of Mental Health and Neurosciences(NIMHANS) :

Neurology India is a highly acclaimed scientific journal by the medical profession. It is published regularly since 1953. Informatics has captured the full content of 45 years of this prestigious journal on one CD for NIMHANS. This extensively hyper-linked searchable database contains 2357 articles. The CD offers convenience of one-click search by author and keywords behind this product is the effort of National Neuroscience Information Centre at NIMHANS

Electronic Resources at the IGNOU and IGNCA

Indira Gandhi National Open University at Delhi has successfully launched a number of web-based online courseware in Information technology under their distant education programme. Indira Gandhi National Centre for Arts (IGNCA) have taken-up multimedia projects for digitization of traditional art works and artifacts which would be made available on the web in due course of time. Digitization of "**Geet Govinda**", important classics of India, is one of their successful ventures. Some other examples of digitization from IGNCA are Murai Devadasi, Muktesvara, Rock Art etc.

Initiatives at IITs:

IIT Delhi: The commitment to digital library initiatives and emphasis on web-based digitized collections at the Central library, IIT Delhi commenced in 1998 with installation of fibre optics-based campus- LAN connected to a 2Mbps VSNL Radio link enabling faster Internet access for the academic community of the Institute. The availability of high speed Internet connection has led to launching of a number of sponsored and unsponsored projects for developing network-based digitized collections at the Central library, IIT Delhi.

The following are some of the initiatives being undertaken at the Central Library of IIT Delhi :

Digitized Collection consisting of Bibliographic records

Online Integrated library Information system

LibSys / Web PAC

Access to Bibliographic databases developed In-House

Database of Serials on subscription in IITD (850 current & 700 discontinue since 1990)

Database of Text Book Collection available in the Central Library (4000 records)

Database of Book Bank Collection in the Central Library (1000 records of 10,000 books)

Database of PhD Theses submitted to IITD

Web Base Access to Materials Science Collection from CSA

Online Interactive Courseware in Information Technology (IT)

In-House Newsletter : New Services and Facilities

CD ROM based Search Services through a CD NET System

Web sites for specialized collections

Research Articles in ERL Linked to Full-text through Silver Linker

Online Access to Journals Subscribed in Print

Home page and the Subject Gateways for Web Resources

IIT Madras

The major digital Initiatives taken by IIT Madras are (i) Creation of IT infrastructure for library and information activities; (ii) Establishment of electronic resource center; (iii) Design and development of website for the Central Library; (iv) Implementation of Total Bar-Coding; (v) Digitization of membership records including photos; (vi) Establishment of CD-ROM Networking under LAN; (vii) Constitution of Digital library Working group; (viii) Subscription of CD-ROM bibliographical databases; (ix) Subscription of Science Direct; (x) Subscription of ACM digital library package; (xi) Creation of CD-Publishing facility for Ph.D Theses; (xi) Providing on-line access to e-journals, e-Books, e-Reference sources, latest additions, journals of the month, library publications e.t.c.; (xii) Providing various web-based services to the users

IIT Bombay

IIT-Bombay has started since 1999 the online submission of Electronic Theses and Dissertation(ETD) of full text of Ph.D theses and M.Tech Dissertations. The library also subscribes to the e-journals.

IITs are fortunate enough to receive the generous grants and projects from Government bodies to develop their digital libraries such as AICTE(All India Council of Technical Education), Ministry of Human Resources Development and Management(MHRD) etc. A number of Online coursewares have been developed, Digitisation of old volumes of journals at IIT Delhi are a few examples of these support from Government.

***Sunsite India*:** The SunSITE India is a joint initiative of the Indian Institute of Science and Sun Microsystems as a large public software archive, maintained on SunSITE India server, a SUN Ultra 150 Enterprise server with 18GB of harddisk storage, donated by SunMicrosystems. The project is managed by the Supercomputer Education and Research Centre(SERC) of the Institute. The collection comprises materials about the 1998 Nobel prize; a set of downloadable system administration Manual in PDF format for Sun solaris and SGI IRIX (manual for UNIX to appear soon); SunSITE India virtual library- a growing collection of online electronic books and tutorials on various computers and programming related topics such as Intranets; CORBA, Java, Javascript, Linux etc; Netscape Mirror- all latest binaries of Netscape software from the official Netscape Mirror site maintained by CSA IISC; a collection of pre-compiled binaries of various packages for sparc solaris; the Bengali writer- a complete font setting package developed in the Indian Institute of Science, that can convert Roman text into Bengali fonts; the GNU-Win32 tools are parts of the popular GNU development tools for windows NT and 95; Java stuff stuff- Java related materials; mpi java, an object oriented Java interface to the standard message passing interface (MPI) developed under the HP Java project at Syracus University; Goodies for web developers- collection of GIF/JPG images-icons, buttons, animated gifs etc; and the current science on-line – electronic access through a web browser of all articles published in the journal from the issue 75(4) of 1998 August 25 to the latest.

Down Memory Lane

A project of the **National Library** , Kolkata for digitization of rare and brittle documents on compact disks. Presently it covers 25 lakh pages having 6601 documents and archived on 548 CDs

Forest Research Institute(FRI)

The Indian council of Forestry Research and Education(ICFRE) has five Institute under its umbrella who are using the CD-ROM databases network, to carry out searching services for their users

Bureau of Indian Standards(BIS)

The BIS has brought out the electronic version of Indian Standards consisting of a complete

collection of Indian Standards with a facility of Instant Search Service (ISS), which provides extensive search and retrieval features on this collection. The complete set of Indian Standards is available on CD-ROM.

Parliament Library

A Digital Library has been set up in the Computer Centre to cater to the needs of members of Parliament and officers and staff of Lok Sabha Secretariat. A large number of index-based databases of information generated within the Parliament were initially developed by the Computer Centre which cater to the instant reference needs of members, officers and research and reference personnel. The data stored and available now in PARLIS databases for on-line retrieval relate to : (i) Selected Parliamentary Questions (only indexes), Lok Sabha and Rajya Sabha, from 1985; Data for questions with text of answers with search facility is available for Lok Sabha from 24.02.2000 onwards on Touch Screen Information Kiosks Server and on 'Parliament of India' Home page for access via Internet; Data for questions with text of answers with search facility is available for Rajya Sabha from 1997 onwards on Touch Screen Information Kiosks Server and on 'Parliament of India' Home page for access via Internet. (ii) Parliamentary Proceedings from 1985-93 (only indexes) since Winter Session, 1993 (full texts); Data for parliamentary proceedings with search facility is available for Lok Sabha from 9.7.1999 onwards on Touch Screen Information Kiosks Server and on 'Parliament of India' Home page for access via Internet; Data for parliamentary proceedings with search facility is available for Rajya Sabha from 30.11.1999 onwards on Touch screen Information Kiosks Server; (iii) Government and Private Members' Bill, from 1985;Data for legislative business with search facility is available for Lok Sabha from 1991 onwards on Touch Screen Information Kiosks Server and on 'Parliament of India' Home page for access via Internet;Data for legislative business with is available for Rajya Sabha from 186th Session onwards on Touch Screen Information Kiosks Server and on 'Parliament of India' Home page for access via Internet;(iv) Directions, Decisions and Observations from the Chair, from 1952; (xv) Council of Ministers, Ministry-wise and name-wise, from 1947; (xvi) Current Awareness Service (Parliamentary Documentation), from January 1989; The references from 1998 onwards are available with search facility on Touch Screen Information Kiosks and on 'Parliament of India' Home page for access via Internet (xvii) Serials Control, from 1989; (xviii) Library catalogue, from 1989; The catalogue can be accessed from Touch Screen Information Kiosks;(xix) Indexes of Microfilms of Parliamentary Proceedings.

University level Initiatives:

INFLIBNET

INFLIBNET, as a National level library network engages in development of national union

databases and has already hosted an online database of Indian theses. This database provides bibliographical details of around 1,37,000 Ph D theses or Doctoral Dissertations awarded by all Indian Universities. It can be accessed via Internet from the website http://www.inflibnet.ac.in. This development was initiated in 1994 and covers all subject areas with data contributed by around 200 universities/institutions from all over India. This online database has the provision to search using the following access points as Title, Researcher, Guide(s), Department, University, Place, Year of award, Subject(s), Free Text and Boolean Search.

Vidhyanidhi project

The Vidyanidhi project based at the University of Mysore and sponsored by India's National Information System for Science and Technology(NISSAT) is emerging as a national effort to create, maintain, and provide network access to a digital library of Indian theses. Vidyanidhi is a Sanskrit term meaning treasure of knowledge has two fold objective: to provide network access to Indian theses; and to reach a global audience for research from Indian Universities. Vidyanidhi is a direct consequence of the policy initiatives identified in the Information Technology Action Plan of Government of India[13]. The impetus has come primarily from a policy initiative [14] that makes it mandatory for all Universities or Deemed Universities in India to host "every dissertation/thesis on a designated website.

Punjabi University, Patiala

The focus of their digitization work mainly involves article archives, and preservation and conservation of lecture series.

University of Hyderabad(UOH)

The Central University of Hyderabad will establish the first total digital library in the country. The University has already identified and started digitization process for its thesis/dissertation collections. This will be joint efforts of UOH, Sun Microsystems and VTLS software company. Indira Gandhi Memorial Library at University of Hyderabad(UOH) is developing a digital library for the University. Locuz, Sun and VTLS have come together to put up the Digital library for the University by using VTLS application and Oracle at the Database platform. Steps that are followed in planning and implementation of the project are as follows :

1. Digitization of the entire physical medium
2. Cataloging and indexing the content
3. Standards for digital library development
4. Delivery Protocols and appropriate resources
5. Representation of content

The first phase of Implementation would be to put the content online for the users within the University and eventually make it available over the Internet. The University would make the necessary provision by using high bandwidth connectivity to the Internet and then implement the necessary security to ensure protected access.

IIMs

All the Indian Institute of Managements (IIMs) do subscribe to e-journals and other digital information products such as CD-ROMs. They have established CD-NET system for access to the CDs on LAN or Campus INTRANET. The IIM Kozikode library has established a Library Portal. It is a web based library portal which has been launched as a one-stop- information shop to the IIMK community in the institute LAN. The portal is envisaged as a single window to the vast treasure of information resources & services of the Library & Information Centre of the Institute.

Digital Library at IITMK (Indian Institute of Information Technology & Management, Trivandrum)

DL paradigm of IIITM-K is not just collection of Books, Audio Visual Aids and back volumes but facilitating access of resources at all levels. This includes online education, discussion forums, references and reviews, authentication of resources, web transactions etc. IIITM-K library is powered by Transversal E Networks (TEN)- a company incubated by the institute. TEN has developed an academic aggregation server concept in which several academic functions such as course Management, Authoring and collaborative group-work are built around their unique metadata standards compliant Digital library implementation. The server called "ACADO" is being field-tested as central information server for Indian Institute of Information Technology-Kerala. The server has more than proven its effectiveness in increasing the productivity and quality of academic collaboration, management of learning environment and research in the institution. The same server can network itself with similar servers in other institutions and form as information, knowledge or educational grids across the different digital library space.

R& D organisation level Initiatives

Traditional Knowledge Library

TKDL: NISCOM – (Multi Institute Project).The Traditional Knowledge Digital Library (TKDL), a collaborative effort between National Institute of Science Communication (NISCOM) and Indian System of Medicine and Homoeopathy (ISM & H), Ministry of Health and Family Welfare was launched on March 27, 2002. TKDL proposes to document traditional knowledge

about plants and the ways and the means to treat diseases with traditional medicine. The first phase of the project covers Ayurveda and will eventually encompass Unani, Siddha, Naturopathy, Homeopathy and also folklore. The information from the slokas (which will be translated in various languages) is codified according to International Patent Classification(IPC). The Unicode (a single code for all languages) are then converted into a database in different languages. A team of 35 Ayurveda experts, two patent examiners, five IT experts and NISCOM Scientists and technical officers are working on the project.

Electronic Resources at the INSDOC

The Indian National Scientific Documentation Centre (INSDOC) has taken steps to established fairly large CD ROM-based fulltext electronic library for document delivery. The fulltext CD ROM products subscribed by the INSDOC include: ADONIS, Business Periodicals Ondisc and General Periodicals Ondisc. Besides, the INSDOC also has several indigenously developed online bibliographic databases.

NAL: Apart from acquiring digital information sources including good number of bibliographic and fulltext databases on CD-ROM like Aerospace Database, NTIS, AIAA Papers, SAE Reports, the Information Centre on Aerospace Technology(ICAST) creates the digital contents of the following: Journal Table of Contents; Newspaper Clippings; OPAC of NAL Library; Union Catalogue of current Journals; NAL Technical Reports. The Centre also maintains the Portal ' AeroInfo'

SAMPADA – Natural History Management Software (NCL Pune). Devised by NCL Pune, it assists individual biological collections to develop their repository database. The major objectives of this exercise are collating information in uniform format and to digitize the specimen themselves. A CD-ROM of Sampada have already been launched with facility to search on different key fields.

NGO level Initiative

***MS Swaminathan Research Foundation(MSSRF)*:** They have specialized databases in diverse areas. These are multimedia based databases. A few example like FRIS(Farmers Rights Information Service) is a digital multimedia database documenting the contribution of tribal and rural families in the conservation of agro biodiversity for the purpose of securing benefits for Natural & global conservation Gene funds.

SPARROW (Sound and Picture Archives For Research on Women)

Sparrow in Versova, Mumbai is building a specialized documentation centre which preserves cultural objects connected with Women's lives

Tata Energy Research Institute(TERI)

TERI has been able to establish a knowledge management system. This incorporates the electronic library. TERI-Information resources may be accessed at various accessed layers. TERI has specialized Networks and Information Centres of National, Regional and International Importance. Online access to in-hous users is provided through TERInet, the Intranet facility of TERI to library catalogue(OPAC) and electronic collections that includes bibliographic and statistical databases, CD-ROM databases, newsclipping archives and on-line journals being subscribed by the TERI library. They have established a Virtual Electronic Library in the area of Energy and Environment. TERI has also established a Directory of Internet Journals with Contents Page Alert Services.

Initiatives at the Media level

Media Group: The Times of India(TOI), Anandabazar Group, Hindu Group have all created their own digital archives of clippings and articles for retrospective search ,HistoricalResearch, Facilitate writing of features etc.

Initiatives at the Private level

Picture/Photography

Atul & Jogi Pvt Ltd: Premier Picture Library in India: More than 95% of their picture is self developed. The library covers almost all possible subject pictures from A to Z.They are involved with the digital imaging and transfer to the pre-press levels. These images are scanned at a low resolution of 75 dpi. The company provides images to the clients through e-mail, zip or CD media.

J-Gate: It is an e-journal initiatives from Informatics India. The vision of J-Gate is to provide a single web-enabled source for libraries/users to access and manage their e-journals in a seamless manner. The J-Gate services currently available are (i) Directory of e-journals; (ii) Table of Content(TOC) access; (iii) Database of Journal Articles; (iv) Link to full-text from TOC and database citations; (v) Availability status in other libraries; (vi) Supply status for current Journals; (vii) J-Gate customs Content

***ICICI Knowledge park*:** It has built up an electronic platform for fast and reliable access to information & strengthening industy-academic meet.

***Digitization of Research Reports at Hindustan Lever Ltd, Mumbai*:** The Hindustan Lever Research Centre(HLRC) have scanned around 85000 pages of research reports being

produced by the Scientists there and OCRed for a centralized, web-enabled intranet database. The project took little over 2-years with an average output of around 180 pages per day.

Initiative at the Government level

In order to turn food producers/consumers into information producers/consumers, the Indian government is making efforts for the inclusion and establishment of " samadhan Kendras" (SK Rural Support Centers) and " Soochana Gumtis " (SG- Information Kiosks) in the list of industries eligible for loans under various programs. Digital Libraries (DL) are being used for the public grievances redressal systems of the state governments through SG facilitation counters in government offices. The following are examples of other recent government DL initiatives:

Financial incentives for creation of software, applications, databases and websites in the more universal Hindi language. All associated hardware/software to have multilingual capabilities.

Promotion of information technology education among the workforce in both public and private sectors, as well as among the future workforce (student population)

Provision of priority information

Gyandoot

Gyandoot (meaning " messenger of Knowledge ") is a new intranet-based DL in the Dhar district of the state of Madhya Pradesh connecting rural public cybercafes. A corresponding website is an extension of Gyandoot intranet providing global access via a portal (http:// www.gyandoot.net). The pilot project was launched on November 29,1999, and it was officially commissioned on January 1,2000.

Initiatives at Other levels:

Library Networks

MYLIBNET, CALIBNET, PUNENET: These networks have been established with the effort of NISSAT. These networks have established their electronic databases.

MYLIBNET Holding database is available at the following site :

http://www.mylibnet.org.in/hold.htm . The databases of MYLIBNET can be searched on categories or title. They are specialized electronic databases.

CALIBNET: The primary objective of the Project is building access to library & information resources available in the eastern region. This has been pursued through : Implementation of a series of Centralized Databases, *both bibliographic and factual* This apart, CALIBNET provides

its members and the user community at large with active link to :*Indian Library & Network Resources*; Oversas Library Resources ***On India***; Worldwide Library Catalogues.; National Libraries of the World ; Newspapers & Journals ; Electronic Reference Tools ;Factual Information Sources

PUNENET: It is possible to search books, periodicals etc on the specialized electronic database of PUNENET

DELNET (Development Library Network) is another fine example of digital library initiatives in India. DELNET has been actively engaged with the compilation of various Union Catalogues of the resources available in member-libraries. It has already created the Union Catalogue of Books,Union List of Current Periodicals, Union Catalogue of Periodicals,CD-ROM Database,Database of Indian Specialists, Database of Periodical Articles, Union List of Video Recordings, Urdu Manuscripts' Database, Database of Theses and Dissertations, DEVINSA Database, sample databases of language publications using GIST technology and several other databases. The data is being updated in each of these databases. All the DELNET databases have been resident on DELSIS, an in-house software developed on BASISPlus, an RDBMS, UNION holding database of books being available in participating libraries is easily traceable from the webpage of DELNET. These databases can be searched on line by participating libraries.

CDAC, Bangalore: Digitisation of Thanjavur paintings is one of the classic example of preservation of art, culture and heritage by C-DAC.

NISTADS, New Delhi: The digitization of Baluchari Designs of West Bengal by NISTADS, CSIR is another example of digital library initiatives in India

URDIP(Unit for Research and Development of Information Products): The CSIR Constituent, Pune has brought medicinal plant details on CD-ROM. This is a CD-ROM on traditional medicinal plants, incorporating both traditional knowledge from Sanskrit classics and modern information. This CD-ROM summarises the chemical studies of plants and biological evaluation of total extracts and fractions thereof. It also lists all pharmacological, biological and clinical work done on pure constituents obtained from plants and also gives the complete structure of any new substance isolated. The CD-ROM has also a list of patent currently granted by the US Patent office on traditional medicinal plants, to highlight how the intellectual property system promotes free access to raw materials and the original knowledge makes it possible for a product to be patented. About 50 widely used medicinal plants in ayurveda has been covered in this CD-ROM. The traditional Sanskrit shlokas found in classical ayurvedic literature has been reproduced along with English translations.

Academy of Sanskrit Research, Melukote: They have done the Digitization of ancient palm-leaf manuscript owned by the academy.

International Sanskrit Research Academy, Bangalore: They have created CD-ROM of Krama Deepika (An Unpublished Sanskrit Manuscript of 17th Century A.D.) and Rigveda

***Digitisation of maps, air photo etc*:** Consulting Engineering Services(CES) , New Delhi an ISO-9001 company has gained sizeable experience in the area of GIS database creation, digitization of Maps, air-photos etc. They have done a considerable number of projects in the area of digital mapping. CES has been shortlisted by the space application Centre ISRO, Ahmedabad and the National Remote Sensing Agency to carry out digitization jobs for NRIS projects and preparation of thematic maps & GIS applications.

Problems associated with Digital Library Development in India:

There are lots of problems facing DL development in India. The lack of interest on the part of parent institutions and the absence of action plans or priorities to that extent are the major hindrance. Though computer and communication infrastructure is improving considerably in India, their availability for information activity is not appreciated to a noticeable extent by the higher authorities in organizations. Even in places where infrastructure is available, there is acute shortage of competent manpower to take up the task of digitizing local contents and emerging digital information repositories. The students faculty, curriculum and training methodology at the disposal of India's library schools have to be visibly improved to meet this challenge. Coupled with this are the steps to be taken for continuing education for retraining the existing staff. The increasing interest in library website development and migration of information sources and services to the web should be treated as stepping stones in digital library development. It is necessary for libraries to judiciously utilize enhanced information access options like web access of subscribed journals. The digital resources thus accessed will contribute a lot to the research activities in India by reducing some of the existing barriers of present information communication channels like time and space. The software growth in India, as a result of big jump in computer penetration, sudden increase in skilled manpower and sizeable improvement in communication infrastructure should be channelised by concerned authorized and information professionals to create and maintain digital information facilities to usher in the new information age.

Some possible suggestions: A few realistic suggestions which are possible for Indian Digital library development are as follows:

- Network the system for an enabling environment;
- Sensitize the library community on all the ramification of the digital library;

- Encourage significant efforts on ETDs (Electronic Transmission of Dissertations);
- Facilitate Transfer of skills/know how;
- Promote preparation of theses and reports in e-format at the point of generation ;
- Emphasize documentation of heritage materials;
- Support publication of scholarly periodicals in e-formats;
- Put on the web, the Book that are outside the purview of copy right especially those of the Indian maestros;
- Government bodies and agencies should adopt digital form instead of paper prints to pave way for a digital culture;
- Digital data preparation and capture be done at source;
- Conversion to digital form the existing information and materials;
- Creation of digital resources (text, images, sound & bibliographic data);
- Identification of current and retrospective resources which needs to be digitized;
- Issues related to language resources needs to be resolved;
- Standards, Technology and tools need to be developed for digital library development;
- Acquisition and archiving of digital resources needs to be done;
- Selection of digital resources, CD-ROM and web based resources be undertaken as a policy matter of all concerned organisations;
- Procurement, preservation and archiving of digital information materials be undertaken by the libraries;
- Developing services based on digital resources to cover:
  - Access (including authentification, security and authorization)
  - Development of Resource discovery tools such as Gateways or Portals etc
  - Establishment of document delivery systems(web based)
  - Establishment of necessary technical infrastructure for the establishment of digital libraries

Conclusion

The digital library initiatives in India is still at an embryonic stage. Though some initiatives has been taken at the National, Regional , Private levels, and at the Government levels the efforts

can only be said to be sporadic. Though the digitization of information materials are taking place in a number of Institutions but the efforts are not in a co-ordinated and organized way. Average efforts have been to get few databases on CDs, taking of subscription of few e-journals, scanning of few documents and creation of pdf files and installing them on an Intranet. Though some institutions are showing admirable efforts in the area of digital library developments such as IITs, IISC , IGNCA etc. IGNCA have done some good work in digitizing our ancient works such as "**GEET GOVINDA"** The projects on digital libraries in India described in this paper are few in numbers. The shortage of trained manpower is an hindrance towards the digital library development. The dearth of encouragement by higher authorities in the organizations has prevented the initiatives from sprouting efficiently. The organizations listed by the paper are fortunate enough to get trained manpower, required finance and infrastructure and support from the management to carry out the digital library developments.. Some definitions of digital libraries which are accepted world wide are mentioned. Some very important digital library initiatives such as TKDL, IITs, IISc, IGNCA, INFLIBNET etc are highlighted in detail. It has been found that, all projects aimed at creating digital libraries concentrate only on special collections.. The process of digitization involves a lot of financial input, trained manpower and modern infrastructure facilities. Some suggestions for the improvement of Digital Library programme in India is mentioned in this paper. The aspects of copy rights and other IPR issues needs to be given a good thought to make the Digital library initiatives a success. The paper concludes that a revolution is required in the hackneyed paper print based thinking process of our authorities and policy makers to usher in real era of digital culture.

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MARC 21 and UNIMARC : An Overview

*Ratna Bandyopadhyay**

Abstract

The paper highlighted some of the important data elements of the bibliographic record as expressed in MARC 21 and UNIMARC formats. Taking these data elements in consideration the paper showed how these are being used in both the formats.

Introduction

The preparation of bibliographic description, determination of different access points, subject analysis and selection of proper subject terms are considered as order making activities of the library. These activities together constitute the challenging work like cataloguing and facilitate in identifying, locating and accessing the documents/items. Consistent and uniform presentation of descriptive details will ensure identification of each document separately and interpret the data elements without unnecessary ambiguity. To share bibliographic information we need to have agreed-upon standards in selecting the data elements for bibliographic description and a standard communication format for integrating the bibliographic record with another system. The computer application has made the standardization more important Any standardized method will provide a unified structure. Machine-readable cataloguing is a convenient method for assigning labels to various parts of a bibliographic record so that the information can be identified and used by computers. The structure of a machine-readable record is known as a format. The purpose of this paper is to highlight the data elements of the bibliographic record as expressed in MARC 21 and UNIMARC formats. Available format documentation of both the structures is very detailed and technical in nature. We have taken some of the important data elements and showed how these are being used in both the formats.

Main Features and Characteristics

To bring our subject into perspective, let us start with a list of some of the main features and characteristics of MARC21 and UNIMARC.

- **Format document :**

  MARC 21 : MARC 21 format for bibliographic data

UNIMARC Manual : bibliographic format

- **Maintained by :**

  MARC 21 : Network Development and MARC Standards Office, Library of Congress in cooperation with Standards and Support, National Library of Canada. MARBI Committee, a committee of ALA and MARC Advisory Committee are responsible for reviewing and Revising MARC 21 format documentation

  UNIMARC : IFLA Committee, the Permanent UNIMARC Committee (PUC) on behalf of IFLA UBCIM

- **Edition :**

  MARC 21 : 1999 with updates

  UNIMARC : 1994 with updates

- **Purpose :**

  MARC 21 : General format for conveying bibliographic information; Systematic coverage of non-book media; Intended to be a standard for the representation and communication of data in machine-readable form.

  UNIMARC : To facilitate international exchange of bibliographic data in machine-readable form between national bibliographic agencies; It may also be used as a model for the development of new machine- readable bibliographic formats; It has also been adopted by several bibliographic agencies as their in-house format. It also covers both book and non-book materials

- **Background :**

  MARC 21 : To align the national formats, British Library (BL), Library of Congress(LC), National Library of Canada(NLC) recognized the need for reconciling the differences prevalent in UKMAARC, USMARC and CANMARC formats. As a result of development in the field of telecommunication and networking they realized the irrelevance of national boundaries in exchanging bibliographic information and in 1997 CANMARC and USMARC formats harmonized. As change in UKMARC required major costly changes, they did not accommodate it. Subsequently the name was changed to MARC 21

  UNIMARC : The different national cataloguing practices led to the development of

several versions of MARC formats like UKMARK, USMSRC, etc. Since 1970s more than twenty MARC formats were developed. There were differences in data content of various formats. There require editing before exhanging records. To solve this problem and to make these varous formats more compatible in exchanging data UNIMARC was developed. It is an international MARC format. This format will accept records in any MARC format. Each national agency who is responsible for the MARC format in the country will have to write two programmes-one program for changing data from national format to UNIMARC and another for converting UNIMARC to national format. Earlier different programmes were needed for each pair of MARC formats, i.e., from UKMARC to USMARC etc.

- **Standards :**

  MARC 21: Based on the international standard for information exchange (ISO 2709)

  UNIMARC: It is also a specific implementation of ISO 2709, an international standard that specifies the structure of records containing bibliographic data

Associated Terminology

Both the MARC and UNIMARC record have definite structures by which the information content can be arranged into a logical order. Before going into the detailed discussion on structures we need to explain some of the terms used by both the formats:

Field : A field contains a single unit of information in a record. One field may be subdivided into one or more subfields.

Tag : Each field is identified by a 3 digit number called Tag; For example, 020 tag marks the ISBN field in MARC 21 and tag 010 identifies the ISBN field in UNIMARC.

Indicator : Some fields are further defined by two character position following tag called indicator. Indicator supplies additional information about the content of the field, about the relationship between the field and other fields in the record or about the action needed for manipulation of data.

Leader/Record Label : For any kind of record some additional information (like new or revised record, record length, format characteristics e.g. music, map, etc), descriptive cataloguing form (e.g. non-ISBD, AACR 2 etc) are required for the processing of the record. This part of a record is generally the first part to come to the attention of the processing programs. So it is termed as Leader or Record Label. The Leader contains 24 characters.

Directory : The searching in a computerized database can be done efficiently if the tags or major content designators can be scanned separately like a table of contents. In case of computerized storage this table of contents is called the record directory or directory. Directory. can be called an location of the variable fields within a record.

Format structures

Both MARC 21 and UNIMARC involve three elements :

- **Record structure :** It is the overall framework for the record.
- **Content designation :** It refers to the set of symbols by which data in the record are identified and manipulated
- **Data content :** It consists of record-specific information field by field.

The computer readable format must he provided with a content designator i.e. a unique identifier for every data element. For example, a field is identified by a tag; a subfield is recognized by a subfield code etc. Similarly a one or two digit codes following tags are called indicators. These indicators provide instructions to computers for processing the data contained in the field. Tags, indicators, subfield codes which identify each element of information that may occur in a bibliographic record are known collectively as content designators. The machine-readable format also asks for certain separators or delimiters to mark the end of fields and subfields and a complete record. These delimiters, content designator help a program to identify the beginning and end of any data element in a variable field.

UNIMARC : Following the International standard ISO 2709 every bibliographic record prepared for exchange must consist of the following :

- **Record Label :** It contains first 24 characters of a record and data relate to structure of the record, type of record, its bibliographic level and position in the hierarchy of level, the degree of completeness of the record etc. These data elements are required for processing the reocord.
- **Directory :** follows the Record Label. The directory consists of several 12 character entries. Each entry contains three parts : a 3-digit numeric tag, a 4-digit mumber which indicates the length of the data field and a 5-digit number which indicates the starting character position. After all of the 12-character directory entires corresponding to each data field in the record, the directory is terminated by the end of the field marker IS2 of ISO 646.

- **Data fields :** The variable lengt data fields following directory are Data (Control) field (with the tag value 00-) and Data field (with tag value 01-to 999). Each subfield begins with a subfield delimiter and a subfield code to identify the subfield.

MARC 21 also consists of following three components :

- **Leader :** It is also the first 24 characters of a record. It also contains similar information as we have seen in the record label of UNIMARC. Data relate to the record length, type of record, bibliographic level, encoding level, descriptive cataloguing form, etc.
- **Directory/Record directory :** The directory begins immediately after the leader. The directory consists of several 12 character entries. The first 3-digit of each entry contains tag. Following each tag the next four positions show the length of the field and the next five positions tell the starting point for this field. It also contains 12 characters. Field terminators (ASCII 1E hex) mark the end of the directory.
- **Variable Fields :** The data in a MARC record is organized into variable fields, each identified by a 3-digit tag that is stored in the Directory entry for the field. Each field ends with a field terminator character. The last variable field in a record ends with a field terminator and with a record terminator (ASCII 1D hex). Two types of variable fields are found : Variable control fields and Variable Data fields.
- **Variable Control fields :** (00x fields) These variable control fields are structurally different from variable data fields. The variable control fields may contain either a single data element or a series of fixed-length data elements identified by relative character position. These fields are recognized by field tag but they do not contain indicator or subfield codes.
- **Variable Data fields :** (0xx-9xx fields) These fields are also identified by a field tag. Two kinds of content designation are used within variable data fields : indicators and subfield codes. The indicators are two one-character positions that contain values that interpret the data found in the field. Every field does not have the indicator. Each Subfield code is preceded by a character called delimiter and is followed by an alphabetic or numeric character.

From the above discussion it can be stated that the general structure of both MARC 21 and UNIMARC is more or less same except the nomenclature like leader in MARC 21 is known as Record Label in UNIMARC.

Functional Blocks

The field in UNIMARC format arranged in functional blocks are :

Blocks	Examples
0-Identification block	010 International Standard Book Number
1-Coded information book	101 Language of the work
2-Descriptive information block	205 Edition statement
3-Notes block	336 Type of computer file note
4-Linking entry block	452 Edition in a different medium
5-Related title block	516 Spine title
6-Subject analysis block	676 Dewey Decimal Classification
7-Intellectual responsibility block	700 Personal name intellectual
Primary responsibility	
8-International use block	801 Originating source
9-National use block	

The data content in MARC 21 is held in fields arranged in blacks that correspond to the way in which information is arranged in a catalogue record.

Field tags	Definition
001-009	Control fields
010-099	Coded and other information
1xx-	Main entry fields
20x-24x	Title and title related fields
25x-29x	Edition, Imprint, etc. fields
3xx	Physical description etc. fields
4xx	Series statement fields
5xx	Notes field
6xx	Subject access points field

700-75x	Added entry fields
76x-79x	Linking entry field
800-840	Series added entry fields
841-89x	Holdings, Alternate Graphics, etc.
9xx	Locally defined fields

Field Level Differences

Now we will examine differences of treatment in some of the significant areas of the record In both MARC 21 and UNIMARC.

- Main entry personal name

  In MARC 21 the tag 100 marks the field. This field is followed by indicators. The first indicator shows the type of personal name or the entry element. The second indicator is undefined. The '0' in the first indicator position stands for forename, '1' in the same position will indicate surname, '3' in that position will stand for family name.

The Subfields used most often are :

$a	Personal name
$b	Numeration
$c	Titles and other wards associated with a name
$q	Fuller form of name
$d	Dates (generally year of birth)

Example : 1001#$aDavid. Frank,$d1886-1914

- Personal name-primary intellectual responsibility

  In UNIMARC this field contains the same information as above i.e., the name of the person considered to have primary intellectual responsibility for a work in an accccccess point form. The tag for the field is 700. Here the first indicator is not defined and the second indicator stands for form of name. '0' in the second indicator position stands for name entered under forename or direct order and '1' stands for surname (family name, patronymic, etc).

  The subfields used most often are :

$a	Entry element
$b	Fart of a name other than entry element

$c	Additions to names other than dates
$d	Roman numerals
$f	Dates
$g	Expansion of Initials of forename
$p	Affiliation/address
$3	Authority record number
$4	Relator code

Example :

700#1$aDavid, $bFrank, $f1886-1914@

Surname and forename elements are treated in different ways in MARC 21 and UNIMARC formats. MARC 21 puts them together in subfield '$a' along with any punctuation that is required, while UNIMARC distinguishes them by means of further subfields.

In MARC 21, '$b' is used to hold a Roman numeral and forename only when the first indicator is '0'.

Ex : 1000# $a Constantine, $bXI Palailogos, $cEmperorof the East, $d1405-1453

- Subject Added Entry – Personal Name (MARC 21) and Personal Name used as subject (UNIMARC) are both identified by the tag '600'.

  In MARC 21 the first indicator in this field marks the type of personal name or the entry element : '0' Forename; '1' Surname; '3' Family name and the second indicator stands for subject heading system/thesaurus :

0	LCSH
1	LCSH for children's literature
2	Medical Subject Headings
3	National Agricultural Library subject authority file, etc.

Subfields used most often are :

$a	Personal neme
$b	Numeration
$c	Titles and other words associated with a name
$q	Fuller form of name

$d	Dates associated with a name
$t	Title of a work
$v	Form subdivision
$x	General subdivision
$y	Chronological subdivision
$z	Geographic subdivision
$2	Source of heading or term

Ex: 60010$aShakespeare, William, $d1564-1616$xCharacters ↕

In UNIMARC in this '600' field the first indicator is not defined and the second indicator shows the form of name : '0' Name under forename and '1' Name under surname. Subfields are as follows :

$a	Entry element
$b	Part of name other than entry element
$c	Additions to names other than dates
$d	Roman numerals
$f	Dates
$g	Expansion of initials of forename
$j	Form subdivision
$x	Topical subdivision
$y	Geographical subdivision
$z	Chronological subdivision
$2	System code (the system or thesaurus from which the subject heading is derived)
$3	Authority record number

For both the formats MARC 21 and UNIMARC these headings are structured in the same form as the headings for persons responsible for the intellectual content of an item. Subfields $a, $b, $c, $q, $d in MARC 21 follow the same as in field 100. Similarly, subfields $a, $b, $c, $d, $f in UNIMARC follow the same form as in field 700. Of course these fields in both formats contain more than the name of the person and additions to the name. Subject headings can be further specifird with respect to form, topic, place and time. These and the subfields are arranged accroding to the rules of the subject heading system.

Ex: 600#1$aShakespeare$bWilliam$f1564-1616$xCharacters$21c@

The $2 subfield code in UNIMARC shows that the thesaurus used is LCSH. In MARC 21/600, the second indicator '0' shows that the field contains a LC subject ehading.

Conclusion

We find that both the formats are based on ISO 2709 and are similar in their structure consisting of Leader/Record Label, Directory/Record Directory and Data Fields/Variable Fields. Only the nomenclature followed in two formats are different. Also both the formats are used for in-house storage for both books and non-book materials. However, the primary purpose of UNIMARC is to facilitate information interchange between national bibliographic agencies following different MARC versions. MARC 21 was created to mainly resolve the differences between CANMARC and USMARC to reduce the cost of cataloguing. If we compare both the formats field by field we will find differences similar to those discussed in the previous section. A detailed field study will be interesting but lengthy. This is not in the scope of the present paper. However, this work may be taken up in the future.

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Classification in Digital Era

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Abstract

Classification is a tool for knowledge organisation. It is required for physical arrangement of information resources in any form and format and useful for libraries of any type or size. Digital environment enhances the scope for multifaceted applications of principles, postulates and schemes of library classification in the areas of automatic synthesis of class numbers, information retrieval and organization of chaotic web.

Introduction

Classification is a method of bringing order in chaos. This order is achieved by labelling each item of a collection so that all items can by arranged in an easy-to-retrieve sequence. Classification is also often known as categorisation since it leads to creation of categories. Libraries have been using different systems of classification for arranging their stock, though the basis might have changed from time to time. Currenty documents are classified on the basis of subject using any classification scheme, like DDC, UDC or CC. The main stock of libraries so long consisted books and other printed documents, the classification of which by the existing schemes did not pose much problem, except for micro documents for which depth schedules had to be prepared. With the appearance of non-book materials and digital and on-line documents, the environment of the library has greatly changed. The time has come to reassess the utility and role of classification in the new environment.

1. Digital Environment

In the new digital environment, more and more documents are being brought in digital form, specially in CD-ROMs, and also an-line, specially the journals. At the moment, mostly double version (i.e. print and digital) of these document are available, but soon in many cases only digital version will be available. Moreover, when both the versions are available, the digital version is invariably cheaper prompting the libraries to go for it. In case of periodicals, the current trend is on-line publication. Besides, a large amount of information resources are now avail-able on Internet. For better management of library activities and for providing better services more and more libraries are going for automation and networks are being created.

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2. Role of Computer

Computer and related technologies play a very important role in this environment. It helps in creating OPACs and databases and search them. It also helps in searching outside databases in network environment. But unless the databases are full-text databases, the computer can only provide bibliographical information of a document or at best location of the document. The document has to be physically retrieved from the library and this is possible only when such documents are maintained in classified order.

3. Role of Classification

It is evident that so long documents continue to adorn the shelves of the libraries, classification will continue to play the same role. In India manually run libraries coexist with automated libraries and will continue to do so for quite some time. Even in automated libraries, the majority of documents are yet conventional. Though computer is used in those libraries for retrieval, the documents are still arranged in classified order. So role of classification has not changed. It is true that the libraries will acquire more and more documents in digital form, and the number of conventional documents will certainly decrease. But even then such documents will have to be physically arranged and retrieved. Hence classification will be required in one form or other.

4. Computerised Classification

Presuming that classification will continue to stay even in digital era, we can now consider if the task of classification can be performed by computers, i.e. whether automatic classification is possible. The feasibility study was conducted in this regard during the first phase (1958-64), which was followed by experimental studies in the second phase (1964-74), after which practical application started. In the beginning the basis of such experiments was vocabulary rather than any theory of classification. But later some experiments were also done using some classificatory principles, specially the priniciples propounded by Ranganathan. It has been felt that there is also enormous scope of applying artificial intelligence in this work. One of the attempts where classificatory principles and artificial intelligence have been used was creation of Viswamitra, created by one of our colleagues in this state.

5. Schedule Maintenance

However, computer is now being used widely for maintenance and display of schedules. The first such attempt was made in 1960s. Now UDC Consortium maintains the computer based master reference file of UDC, while OCLC maintains the computerised master file of DDC. The new editions of both the schemes are now being brought out from those files. Library of Congress Classification reportedly also maintains such a file.

6. Greater Role

The classificatory principles are playing a greater role in the digital era than arrangement of documents on shelve. The DBMS packages take help of such principles. Classification techniques also play an important role in the design, development and operation of mechanised information storage and retrieval systems. Much research has been done on UDC as a language for information retrieval. It has been found that UDC can be used successfully in both batch processing and interactive mode. DRTC conducted experiments to determine the feasibility of using a general purpose computer in a document-finding system based on a classified catalogue system using a freely faceted version of CC. The results have been encouraging, but possibly further experiments could not be carried out. A set of experiments were also caried out to determine the suitability of CC as a basis for automated analysis, representation and retrieval of primary information from the full text of a document. However, result showed that the systems based on CC did not perform significantly better that other systems.

7. Classification and Internet

Internet today has become very popular as a means for searching on-line information. Many search engines have been created for this purpose, but none is possibly able to satisfy all types of searches. The main reason for this is that the materials available on the net are not properly classified. Several projects have now been started to explore the possibility of using library classification schemes for organisation and search of Internet resources. Some classificatory models have also been developed for classifying Internet resources.

8. Conclusion

It is obvious that classification has not lost its place in digital era. Rather its application has increased, to organise digital and on-line information. Researches are continuing on adaptation of classification schemes and classificatory principles for organisation of digital information resources and a day may come when it will be possible to find the required information instantenously.

Seamless Information Environment and Seamless Infrastructure

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Abstract

Presents a trend analysis and normative features of seamless information environment and seamless infrastructure.

Seamless Information Environment is what we are experiencing throughout our civilization. Oral communication to written communication was a language revolution. Written to print was Gutenberg revolution. Print to compuprint has been a computer revolution. We have radiocast, cinecast and telecast revolution to compliment with. Compuprint to Internet is network revolution. Internet to knowledge net is a Knowledge management revolution. We are moving to memory-modeling revolution. A11 these revolutions are seamless existence with the current communication. Oral communication is still the predominant and most human one.

Seamless information environment and seamless infrastructure act as a source for management of Knowledge for human development. Knowledge development is a network of knowledge processes. Knowledge creation, knowledge capture, knowledge development, knowledge structure, knowledge diversification, knowledge publication, knowledge management, knowledge utilization, knowledge transfer and re-engineering are the eight processes of knowledge science and technology. Seamless Environment calls for consolidation compatibilities of these processes. Seamless environment needs several conducive coordination These are delineated in the ensuing text.

1. Seamless Information Environment

1.1 Boundaryless Database Services and Network Services.

1.2 Varieties of bibliographic data access.

1.3 Varieties of access to primary data, information and knowledge.

1.4 Variety of ways to negotiate and manipulate data for new information and new knowledge.

1.5 Variety of ways to organize data for better interface at intermediate and end points.

1.6 Variety of ways for Knowledge management and service to human mind.

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2. Seamless Management Structure Seamless management Structure refers to the following aspects :

2.1 Provide for flexible and continuous access to information.

2.2 Provide for Library walks for Information.

2.3 Provide for browsing, searching, retrieval and access-Professional Combine for end user library services-Seamless professional service.

2.4 Provide for Format-Carrier oriented library services to Information content.

2.5 Provide for selection of materials based on end user requirement rather preservation.

2.6 Provide for facilitation of Current User's Interest focus and satisfaction with library service.

2.7 Provide for comprehensive library services to users at their access points and workstations.

2.8 Provide for collaborative management information tools and services.

2.9 Provide for continuous watch of users' assimilation of information.

2.10 Provide for updating, obsolescence, clearing, and novelty adding in information sources, tools and services.

2.11 Provide for Electronic Information as a public services such as radio broadcasting, telecasting, electronic newspapers and services.

2.12 Provide for training of end users for better information browsing, retrieval and use.

2.13 Provide for training of library and information professionals and for productive and conducive use of information tools for service.

2.14 Provide for personal reference interview and temper it with professional insight and information counselors.

2.15 Provide for twenty hours access to seamless arrays of information to end users with modulation and moderation.

2.16 Provide for threshold conditions for access and assessment of information they get. Criteria: Relevance? Authenticity? Currency? Utility?

2.17 Provide for multimedia interfacing with customizing facility for end users' assimilation.

2.18 Provide for end users a variety of tools to handle information system and services, such as access tools, productivity tools, research tools, knowledge tools, personal storage/memory tools, and portable transfer tools in the form of intelligent agents.

2.19 Provide for multiconferencing facility as a seamless channel for information exchange and absorption.

2.20 Provide for role content plays of information for better transmission, dissemination, retrieval, access and use.

2.21 Provide for a "bottomless" financial structure to support financially flexible information systems and services; facilitate by adopting e-commerce agents and tools.

2.22 Provide for a virtual library program for end-users to have simulated feel of library walks and atmosphere, learning atmosphere and knowledge acquisition facilitation.

2.23 Provide for professional ethics that exudes a convenient intellectual property right flow and services ownership and usability facilitation.

2.24 Provide for a basic connectivity with organizational ethics, purposes and services — organizational culture facilitation.

2.25 Provide for seamless connectivity with information industry for productive use of creative and useful information and feedback.

2.26 Provide for key ingredients to expertise and collaboration for information utilization in diverse sectors of social/economic life.

2.27 Provide for a continuous flow of information from a variety of information creators, sources, governments and non-government institutions

The beauty of Seamless Information Environment is that it exhibits a flexible organization in emergent evolutionary systems. Education, Specialization, Management and Communication systems absorbs this seamless flow as part of Universal Knowledge Management.

Dictionary as a Valuable Source of Information

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Abstract

This survey based paper focuses the information contents of dictionaries. Dictionaries are merely not a tool of pronunciation, grammatical forms and functions, etymologies, syntactic peculiarities, variant spellings, conventional abbreviations, synonyms, and antonyms and illustrative quotations, but an important source of general knowledge which can meet up some of our needs for information. It also discusses the definition, historical background and development (chronology and stages of development), and types of dictionaries, distinction between encyclopedia and dictionaries as well as observation and findings on the peculiarities of some selected (additional information if available) dictionaries.

1. Introduction

It is nonetheless to say that dictionaries are used mainly for meaning and pronunciation of the words, verb, adjective or adverbial forms of the same. But it can be used as a general knowledge refresher too. Some dictionaries play a vital role in ready reference service - these are two-in-one sources of information covering additional information of general knowledge nature.

However, the word 'Dictionary' comes from the Latin 'dictio', "the act of speaking", and 'dictionarius', " a collection of words". Dictionary is a reference book consisting of totally unconnected items customarily listed in alphabetical order and followed, variously, by information about their pronunciation, grammatical forms and functions, etymologies, meanings, syntactic peculiarities, variant spellings, conventional abbreviations, synonyms and antonyms, and illustrative quotations, sometimes dated to show the earliest known uses in specified senses. According to Chambers Twentieth Century Dictionary (1982), Dictionary is a book containing the words of a language alphabetically arranged, with their meaning, etymology, etc.; a lexicon; a work containing information on any department of knowledge, alphabetically arranged. Where there is a "connection" the publisher may or may not use the term dictionary in the title e.g., INB (Indian National Biography), has the connection of alphabetical listing only the dead who are. In USA, 90% households have a dictionary. In addition, another 20% own a crossword puzzle dictionary and 8% rhyming dictionary.

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Hence, dictionary is the title of a reference book does not necessarily refer to a language dictionary, but only to alphabetical order, and a central theme. It is a book almost everyone reads, but never reads thorough. The plot is non-existent, the ending shamelessly predictable and the style sets the standard for wordiness.

The initial impetus for making dictionaries differed slightly from current principles. The early emphasis was less on making inventories of current word usage than on explaining changes on differences of meaning over centuries and among languages.

Keeping pace with technology, publishers offer numerous dictionaries available as part of a software package for the home and office computer's word processing system. In addition, several major sets, including Oxford English Dictionary, are on line.

2. Types of Dictionaries

Dictionaries may be grouped in two classes : those which explain words and phrases, and those which give information about things.

Dictionaries of words again may be grouped into following sub-classes viz. i) lexicon ii) special dictionaries iii) thesaurus iv) etymological dictionaries v) concordance vi) vocabulary.

'Lexicon' is most commonly understood to mean an alphabetical list of the words composing any language explained either in the same language or by the corresponding words of one or more other languages ; 'special dictionaries' likewise explain the words of particular authors, e.g. of Homer, Sophocles, Cicero, Livy, Tacitus or Shakespeare; a 'thesaurus' is designed to include all the words of a language, as in the Hebrew Dictionary of Gesenius and the Thesaurus linguaelatinal (the German equivalent word is sprachs chatz; other Latin titles are gazophylacium, catholicon, promtorium, glossographia, abecedarium, ortus or hortus and manipulus vocabulorum and English has 'expositor', 'interpreter' and 'world of words'; a glossary is a dictionary of unusual or selected words, archaic, provincial or technical); an etymological dictionary is the science or investigation of the derivation and original signification of words in a dictionary; concordance, an index of the words or passages of a book or author; vocabulary, a list of words explained in alphabetical order in a dictionary.

Dictionary of things may be similarly subclassified into i) encyclopedia ii) dictionaries of quotations. Besides these, there are dictionaries of biography, geography, music, gardening, physics, chemistry, botany, etc.

Broadly, there are seven types of dictionaries : i) General English language dictionaries ii) Paper back dictionaries iii) Historical dictionaries iv) Period or scholarly dictionaries v) Etymological dictionaries vi) Foreign language dictionaries vii) Other dictionaries (abbreviation, slang and proper usage).

3. Historical Background and Development

The origin of dictionaries is not recorded, but it can be assumed that it is far beyond the first examples that are known to have existed. To some extent the history of the evolution of the dictionaries is inseparable from that of encyclopedias, but since the latter is dealt with separately, the present article is restricted to the area of dictionaries that have had a definite influence on the development of dictionaries. Greeks in the century AD made dictionaries to explain obsolete words from their rich literary past. Latin also was preserved in dictionaries, which were of considerable value because most scholarly work for the next 500 years was done primarily in Latin. So influential was one such dictionary compiled by Ambrogio Calipino in 1502, that the name of Calepin was often substituted for the word dictionary. The following Tables 1 and 2 give brief idea about the chronology and stages of the development of dictionaries :

Table : 1 Chronology of the development of dictionaries

Time	Name of the Compiler	Type
Beginning of 2nd Century	Aristophanes of Byzantium (C.257-B.C. 180), Librarian, Alexandrine Library	Dictonary of Greek Words (curiosity concerning the origin and and meaning of words throughout the Classical periods)
153 B.C	Aristachrus of Samothrace	Homeric language (pioneer work)
20 B.C.	Marcus Verrius Flaccus	Latin dictionary (not survived)
About 100 A.D.	Hsü Shên	Chinese (Shu Wên Chieh Tzu) 10,000 characters
4-6 Century	Amara – Sinha	Dictionary of Sanskrit
8th Century	Sextus Pompeius Festus	De Verborum Significatu

Table : 2 Stages of development of dictionaries

Time	Nature
From Classical Times to 1604	Inter-lingual dictionary Thomas Cooper and his thesaurus The first rhyming dictionary
From 1604 to 1828	First purely English dictionary Korsey's new English dictionary Samuel Johnson's plan pronouncing dictionaries
Since 1828	New trends in dictionary making The beginning of the Oxford English Dictionary The Centenary Dictionary

The earliest dictionaries in England were written for the purpose of explaining Latin words in English. Dr. Johnson's dictionary (1755) was the first standard English Dictionary; it long held foremost place in English lexicography, as did that of Noah Webster (1828) in USA. The Oxford New English Dictionary appeared in 10 Vols., 1884-1928, and a revision began in 1958.

4. Distinction Between Encyclopaedia and Dictionary

The distinction between a dictionary and an encyclopaedia is easy to state but difficult to carry out in a practical way: a dictionary explains words, whereas an encyclopaedia explains things. Because words achieve their usefulness by reference to things, however, it is difficult to construct a dictionary with but considerable attention to the objects and abstractions designated. Nonetheless, while a modern encyclopaedia may still be called a dictionary, no good dictionary have ever been called an encyclopaedia.

5. Observation and Findings

In this survey, we examined 59 dictionaries of different nature out of which additional information (other than meaning, pronunciation, verb, adjective, adverbial form) are available in 30 dictionaries, whereas 29 dictionaries have no additional information. Analysis shows that there are 43 monolingual dictionaries (out of which 31 dictionaries are in English language i.e. English to English, 6 in Bengali language i.e., Bengali to Bengali, 2 in French language i.e., French to French, 1 in Latin language i.e., Latin to Latin, 1 in Gaelic language i.e., Gaelic to Gaelic, 1 in

Hindi language i.e., Hindi to Hindi, and 1 in American English language i.e., American English to American English), 11 bi-lingual dictionaries (3 English to Bengali, 2 French to English, 1 German to English, 1 Russian to English, 1 Hindustani to English, 1 English to Arabic, 1 Khasi to English, 1 British English to American English-catch phrases), 2 mixed dictionaries (1 Anglo Indian & 1 Anglo-Bengali Colloquial), 2 tri-lingual dictionaries (1 Hindi-English-Bengali and 1 Sanskrit-English-Bengali) and 1 Penta -lingual dictionary (English-Malayalam-Tamil-Hindi-Arabic). It is also noted that 2 illustrative dictionaries, 1 encyclopaedic dictionary, 1 subject dictionary, 1 abbreviation dictionary, 1 school and office dictionary, 1 business dictionary, 1 biographical dictionary, 1 dictionary of quotation and 1 idiomatic dictionary are available in the above monolingual dictionaries.

After a thorough study of 30 dictionaries (additional information available), we gathered different information of general knowledge nature from those which help the potential users making aware about the added information. Those are grouped into 17 categories (Table-3) viz. 1. Independent countries of the world, 2. U.S. & Canada, 3. The Commonwealth, The Commonwealth of Australia, India, 4. Chemical Element and Chemistry, 5. Measurement, 6. Numerals, 7. Geography, 8. Mathematics, 9. Biology, 10. English Language &Literature, 11. Other Than English Language, 12. Alphabet, 13. Christian Names, 14. Biography, 15. Bible, Mythology & Religion, 16. Signs, Symbols & Terminology, and 17. Miscellaneous. Information coverage of specific categories have shown in Table 4. We also ranked the dictionaries according to their availability of additional information. The Concise Oxford Dictionary of Current English has been ranked first (1st) with 13 categories of information, Students' Favourite Dictionaries : English to Bengali to English was ranked second (2nd) with 11 categories of information, Oxford Advanced Learner's Dictionary of Current English has been ranked third (3rd) with 9 categories of information. Ranking has been shown in Table 3.

We counted the number of pages containing the additional information in all such dictionaries. We found that Webster's New Twentieth Century Dictionary of the English Language allocates 160 pages for this purpose followed by Students' Favourite Dictionary : English to Bengali to English that contains 156 pages, Webster's Collegiate Dictionary contains 99 pages and Webster's comprehensive Dictionary contains 48 pages and others cover less.

6. Conclusion

From the above discussion it is very clear that some dictionaries also provide non-lexical information which help us to meet up our day-to-day information needs and aware us about some additional knowledge. So these are also alternative to ready reference sources in certain extent and actually valuable sources of information.

Table 3 : Additional Information Coverage of Dictionaries

Sl. No	Name of the Dictionary	Independent Countries of the World	US & Canada	The commonwealth The Commonwealth of Australia & India	Chemical Element and Chemistry	Measurement	Numberals	Geography	Mathematics
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.	Abhidhana Sankalan							✓	
2.	Classell's German and English Dictionary								
3.	Classell's new French-English English-French Dictionary					✓			
4.	Chalantika : Adhunik Bangabhasar Abidhan								
5.	Chambers Twentieth Century Dictionary				✓	✓	✓		
6.	The concise Oxford Dictionary of Current English	✓	✓	✓	✓	✓	✓	✓	✓
7.	Dictionaries Du Francais Langue Etrangere								
8.	The Dictionary of Diseased English								
9.	Harrap's Standard French and English dictionary : With Supplement								
10.	Hobson-Jobson : A Glossary of Colloquial Anglo-Indian Words and Phrases								
11.	Lempriere's Classical Distionary								
12.	Longman Dictionary of contemporary English	✓				✓			✓
13.	Longman English Larousse				✓			✓	
14.	Macmillan Contemporary Dictionary					✓			
15.	Oxford Advanced Learner's Dictionary of Current English				✓	✓		✓	✓
16.	Oxford Illustrated Dictionary			✓	✓	✓			
17.	The Oxford Mini Dictionary	✓			✓	✓	✓		
18.	Oxford Progressive colour Dictionary	✓							
19.	The Oxrord Russian-English Dictionary								
20.	The Oxford Senior Dictionary	✓			✓				
21.	The Penguine Concise Columbia Encyclopaedia							✓	
22.	The Random house Dictionary of the English Language						✓		
23.	Samsad Bangla Abhidhana								
24.	Samsad English-Bengali Dictionary					✓	✓		
25.	Students' Favourite Dictionary : English to Bengali to English				✓	✓		✓	✓
26.	Webster's Collegiate Dictionary		✓					✓	
27	Webster's Comprehensive Dictionary								
28.	Webster's New School and Office Dictionary						✓		
29.	Webster's New Twentieth Century Dictionary of the Englsih Language		✓			✓		✓	✓
30.	Webster's New World Dictionary of the American Language		✓			✓			

Continued

Table 3 : Additional Information Coverage of Dictionaries (continued)

Sl. No.	Name of the Dictionary	Biology	English Language and Literature	Other than English Language	Alphabet Names	Christian Names	Biography & Religion	Bible, Mythology and Religion	Sings, Symbols & Terminaling	Misce-llaneous	Ranking
		(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	
1.	Abhidhana Sankalan			✓						✓	11
2.	Classell's German and English Dictionary		✓								10
3.	Classell's new French-English English-French Dictionary		✓	✓							9
4.	Chalantika : Adhunik Bangabhasar Abidhan			✓							11
5.	Chambers Twentieth Century Dictionary		✓	✓	✓	✓			✓		3
6.	The concise Oxford Dictionary of Current English	✓	✓	✓	✓			✓		✓	1
7.	Dictionaries Du Francais Langue Etrangere			✓							11
8.	The Dictionary of Diseased English									✓	11
9.	Harrap's Standard French and English dictionary : With Supplement		✓								11
10.	Hobson-Jobson : A Glossary of Colloquial Anglo-Indian Words and Phrases									✓	11
11.	Lempriere's Classical Distionary		✓								11
12.	Longman Dictionary of contemporary English	✓	✓						✓	✓	5
13.	Longman English Larousse		✓								9
14.	Macmillan Contemporary Dictionary										11
15.	Oxford Advanced Learner's Dictionary of Current English	✓	✓			✓		✓		✓	3
16.	Oxford Illustrated Dictionary									✓	7
17.	The Oxford Mini Dictionary		✓								7
18.	Oxford Progressive colour Dictionary		✓								10
19.	The Oxrord Russian-English Dictionary		✓								11
20.	The Oxford Senior Dictionary										10
21.	The Penguine Concise Columbia Encyclopaedia		✓								10
22.	The Random house Dictionary of the English Language		✓				✓			✓	8
23.	Samsad Bangla Abhidhana			✓							11
24.	Samsad English-Bengali Dictionary		✓		✓				✓	✓	6
25.	Students' Favourite Dictionary : English to Bengali to English		✓		✓	✓	✓	✓	✓	✓	2
26.	Webster's Collegiate Dictionary		✓			✓	✓		✓	✓	5
27.	Webster's Comprehensive Dictionary		✓						✓	✓	7
28.	Webster's New School and Office Dictionary		✓ ✓		✓				✓		8
29.	Webster's New Twentieth Century Dictionary of the Englsih Language		✓				✓	✓	✓		4
30.	Webster's New World Dictionary of the American Language		✓						✓		8

Table : 4

Specific Categories of Additional Information available in Dictionaries :

Sl. No.	Specific Head	Information Content
1.	Independent Countries of the World	Country, Person, Related adjectives, Currency unit, Principal dependencies.
2.	U.S. & Canada	States of the USA with their capitals, Presidents & Vice-Presidents, Declaration of Independence, Constitution, Charter of the UN, Air distances between Principal Cities of the U.S., Population of places in the US having more than five thousand inhabitants, Population of US inhabitants summarily states, Territories and professions, Provinces and Territories of Canada, History of Canada : a chronology of important events, Population of places of Canada, Colleges and Universities in the US and Canada.
3.	The Common Wealth, The Common Wealth of Australia, India	The British Common Wealth, The Common Wealth of Australia, India, Rulers of England and of the UK, Prime Ministers of Great Britain, Countries of the UK : Official names with abbreviation.
4.	Chemical Element & Chemistry	Chemical names of common substances, The Periodic Table of chemical element
5.	Measurement	Nationality money tables, British (Metric), Indian and American weights and measures, Temperature (Celsius to Fahrenheit conversion), Mean, Diameter, Volume, Mass of Earth, Sun and Moon, Beaufort scale of wind speed.
6.	Numerals	Roman numerals

Continued...

Table : 4 (continued)

Sl. No.	Specific Head	Information Content
7.	Geography	A short gazetteer of the world, Geographical surnames, The highest; The longest, The largest, Principal geographic features of the world, A pronouncing gazetteer containing more than six thousand names of places, Maps, New national calender of India, Major divisions, of geological times.
8.	Mathematics	Mathematical formulaes, Numerical expressions, Number tables, Practical Business Mathematics.
9.	Biology	Biological classification, Terms for groups of animals, Animal table, Table of family relationships.
10.	English Language & Literature	Proverbs and Quotations, Plurals, Grammar, Punctuation Marks, Capitalization, Italicization, Reference to People, Offensive language and sexism, Abbreviation, Important prefixes and suffixes, Synonyms and antonyms, List of idiomatic common place comparisons, list of collective phrases, Dictionary of English literature, Different in Meaning in some synonyms, List of Indian words and foreign words familiar in India borrowed into English with some or no change, vocabulary of rhymes, Key to verb patterns, key to phonetic symbols, Irregular verbs, The works of William Shakespeare, Defining vocabulary, Notes on American English, Words games supplement, Forms of letters, Forms of address.

Continued

Table : 4 (continued)

Sl. No.	Specific Head	Information Contained
11.	Other than English Language	Words and phrases from Greek, Latin, French and Modern foreign languages, Indo-European languages.
12.	Alphabet	Greek and Russian alphabet.
13.	Christian Names	List of common diminuitive forms, Diminuitives of Christian names frequently met with literature, Femine forms of Christian names, Pronouncing vocabulary of common English Christian names, Common forenames, common first names.
14.	Biography	A pronouncing biographical dictionary containing more than three thousand names of noteworthy person.
15.	Bible, Mythology and Religion	A concise classical and mythological dictionary, Books of the Bible, Dictionary of scripture proper names and foreign words with their meanings and place in the Bible.
16.	Signs, Symbols and Terminology	Signs and symbols, Glossary of terminology, Table of codes, Principal commercial and financial terms in eight Languages,
17.	Miscellaneous	Chronological tables, Libraries of the world, Sports folio, Correction of printer's proof, National honours and awards, Roman emperors of the Western (or Holy Roman) empire, The Popes since the seventh century, citizens band radio communication, Table of military ranks, Words and Phrases of general knowledge, Manuscript preparations, Footnotes, Books, Brochures, Journal and periodicals, Newspapers.

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Muses, Museums, Memories and Multiculturism

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Abstract

The origin of the museum from the "museus" has been traced in this article. Museums have traversed this route through 'respositories', 'collection houses', 'archives', and have finally reached a point where the conglomeration of various cultures, ethnic groups, races, castes, or religious have occurred. The manifold functions of the museums which make them a social forum have been indicated. Museums are endowed with much more responsibilities than even before, shouldering a positive beneficial attitude towards the society. The changing face of museums, with the technical and technological know-how, and interactive mode of presentation, all add to the contemplative role of the museums, in the present society. The role of modern museums, with a digital and virtual make-up, giving a new face-lift to the society has been described. Museums were there in the past, are now in the present and must be very much present in the future society, for the benefit of one and all.

1. Introduction

Museums are more than repositories of the past, with memories and objects — rare and beautiful. Museums are cultural, educational and civic centres in communities; centres for exhibition, conversation, research and interpretation; they house theatres and movie halls, schools and day-care centres, libraries and concert halls. The concept of museums, as quiet contemplative places of learning, where collections are cared for and researched by scholars has changed dramatically in recent times. The number of museums that offer this kind of conventional experience is decreasing; they increasingly tend to serve as gathering places, as forums for their communities. Exhibitions presented and the range of materials incorporated into collections reflect the multiple voices, needs, and interests of individual communities.

The word "museum" comes from the Greek "mouseion", which identified a temple, dedicated to the Muses, the nine goddesses for inspiration, learning, and the arts. In fact, there were nine Greek Goddesses of literature and music. "Muses", in ancient Greek mythology, refers to the Greek goddess, presiding over all learning and art. The nine Goddesses were Goddess of epic.

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Goddess of poetry, of history, of love poem, of tragedy, of speech and oratory, of dance of comedy, and Goddess of astronomy.

Among the most famous classical museums, was the one in Alexandria founded the third century B.C. and destroyed in the third century A.D. There is a direct relationship between Alexandria's mouseion and the museums of to-day; both are gathering places of objects and ideas, that assist individuals in understanding the world around them. The use of the term 'museum' was more broadly developed during the Renaissance, referring to the private collections of individual persons. These "cabinets of curiosities" with antiquities, rare jewels, and other objects on display, reflected the pride of their owners. These museums were intended to provide pleasure to others, as well as opportunities to discover, and to learn.

2. Museums as Centres of Learning

The common characteristic of all museums is their role as educational institution. While not all museums acquire, conserve, or study objects, all museums are public places, devoted to engaging the public in learning as well as in disseminating knowledge. In fact, they are increasing their capacity to provide both education and entertainment. When institutions in general appear to be struggling for survival, museums professionals began to address seriously the problem of losing their audiences to theme parks and the internet. They looked for ways to revitalize their image. Today museums are redefining themselves as learning experience environments, studying the methods and politics of their competitors.

Involvement in Learning is, of course, a lifelong process; involving a rich matrix of experience, including formal education in schools, colleges and universities, as well as informal learning. The learning beyond schools – in the home, in travel, and in libraries and museums – supports this continuous educational experience. Museums play a central role in the study, preservation and interpretation of world's cultural heritage. What a museum has been aiming to achieve is more important than what it is. The trend, which is unmistakable, makes defining of the museum increasingly difficult, and perhaps increasingly pointless. As a result a large range of institutions now has earned the right to the name 'museums', than was the case only forty years ago.

3. Museums as Forums

India's communities are changing in their cultural demands. As a result, museums are increasingly becoming public forums, gathering places for exchange of ideas, creators of shared memories. As museums entertain audiences becoming more and more diverse, ethnically as well as economically, as physical abilities and education levels are becoming increasingly desperate, new features are being added to museum's offerings, the exuberance of world-wide web has

added yet another dimension to the role of museums as forums. Museums are becoming 'virtual museums', with beautifully produced pages that summarise their offerings, take one on a virtual tour of their galleries, and provide access to the collections and exhibitions with images and audio.

4. Museum's Functions

Museums have long been places of inspiration, conversation, and celebration — places that feed on natural curiosity about the world. Museum were product of the Renaissance, a product of an aristocratic and hierarchial society which believed that art and scholarship were for a closed circle. In Europe and in most colonial territories, museums and art galleries began at a time, when the people who controlled them had contempt for the masses. Collections were formed by men, who wished to display them to others, with the same tastes and level of knowledge as themselves, to connoisseurs and scholars. Any idea, that there might be a duty to make this material interesting or intelligible to a wider range of visitors, would have seemed ludicrous.

In the seventeeth century, only distinguished travellers and foreign scholars were as a rule, permitted to see the collections belonging to the European princes, which were often housed in the places themselves. When public museums, such as the British Museum, were established in Europe at the end of the century, they carried on the traditions of the private collections. They were run by aristocrats, who asked for nobody's advice as the collections were admitted more as a privilege, rather than a right & consequently gratitude and admiration, not criticism, was required of them.

In the late 20th century, however, aesthetic concerns have increasingly influenced display techniques. As museums have evolved from temple-like treasure houses of 19th and early 20th centuries into centres for education and recreation, they still play important roles in scholarship, and many museums maintain research facilities and libraries for staff and outside scholars to study and publish information based on objects in it.

5. Museum Object

A museum object is a heritage item. It is a physical object whose material and form carry rich layers of meaning to be communicated as messages from the past to the present, and which must be preserved for the future. Museum objects have some specific meaningful aspects. They should be practical, aesthetic, symbolical and metaphysical. Being the source, carrier and transmitter of information, museum objects are linked between museology and any fundamental discipline. The bond between museology and the other disciplines remains through these objects. They are thus a very important linkage. While a basic discipline focuses on one aspect of the

object and remains confines to the documentational and partly communicational approach, museology provides an open approach to the object as an unlimited source of information preserved and communicated. The result of this is that the different identities of a museum object is studied analytically and it becomes a source of information.

The definition of a 'museum object' and the associated practices of acquisition, preservation, care, display, study and interpretation have always been fluid and have become more so recently. If the essence of a museum is not to be found in its objects, then where ? The answer is, in being a place that stores memories and presents and organises meaning in some sensory form. It is both the physicality of a place & the memories & stories told therein that are important. As Van Mensch justly mentions (1989), that "its conceptual identity its that which its maker had in mind before making it; its factual identity is its shape at the moment when it was made; its functional identity reflects and follows its changing uses; and its structural identity reflects its changing material structure in the course of its lifetime; tinally, its actual identity is a changeable property reflecting the object's actual state of the present". Further, I propose that two essential ingredients — place and rememberances – are not exclusive to museums. And finally, I contend that the blurring of the distinctions between these institutions of memory & other seemingly separate institutions is a positive, rather than negative development.

6. Multiculturalism : Cultural Diversity

Multiculturalism is a spongy term that has occasioned more debate than precise definition. For some time now, anthropologists have been trying to figure out of multiculturalism as a social movement, can be harnessed to the discipline's effort to educate on "Cultural Diversity". The title of Nathan Glazer's recent book as noted by Pinsker, argues that "We are All Muticuturalists". Now, but how does this announcement usefully distinguish between those who would add, "And Furthermore We Have Always Been So", from those who find themselves uncomfortable with much that now marches under multiculturalism's very wide banner ?

Multiculturalism education takes place in schools, community organisations, adult education institutes and museums, but often this activity is seen to be exotic and somewhat superficial. In the context of public institution or public debate, multiculturalism is a matter of marginal concern and rarely a serious consideration for mainstream policy or financial priority. Yet, with the movement of world populations and with the displacement of large groups of people for economic and political reasons, it is imperative to understand the problematic relationships that exist between concepts such as recognition and cultural identity, cultural exclusion and survival of cultures, collective identities, cultural exclusion and survival of cultures, collective identities and individual authenticity — some of the basic concepts that underline the notion of multiculturalism.

The depiction of the Mumtaz Mahal celebrated the best of multicuturalism. The appeal of the painting was not its technical excellence or interesting object matter, but the mystery of Mumtaz Mahal, Shahjahan's wife, and the inspiration behind the Taj Mahal. But her very absence from the painting, Mumtaz became a tantalizing figure and fired the imagination of the young women. At no stage organized as 'multicultural', the vibrant textile panel, which was created, celebrated the best of multiculturalism. It gave the women a strong sense of their British Asian identity, reinforcing some traditional aspects of their root culture, whilst simutaneously allowing them the scope to express the modernity and freedom associated with contemporary Western Womanhood.

7. The Multicultural Future

Multiculturalism and questions of identity may be viewed either negatively or positively, depending on whether they are seen as emblematic of quaint nostalgia, of competitors in access to work or housing, or as unwelcome values or beliefs. Zolberg Vera L. quotes James Wood, who warns against "policized museums", that may make American art museum an arena for ethnic conflict, and European ones, hotbeds of "regional nationalism. The large issues of the end of the enlightment, ideal of the universal, and cultural relativism gone wild, underline some of the concerns that museums people have expressed. For some ponts of view, however, these problems may be opportunities.

8. New Realism Before New Realities

Faced with constraints that show every sign of enduring, nuseums have little choice but to try to reach the goals of balancing public expansion with rethinking criteria of quality. Their tendency is to focus on the means and assume a consensus on ends, that is far from certain. Hein Reedijk has noted the increase in visitors who are relatively new and inexperienced museumgoers. He argues that museums should take on the challenge that these people present, and find ways to draw them in more deeply. In the course of his analysis in the journal ***Museumvisie***, he raises questions about what should displayed and how; how should museums go about finding what a new public might be drawn to ? Should it be by academic research ? Inter-disciplinary discussion groups ? By learning from other media ? Or, by using "common sense" ?

Staying in the realm of means, it seems that common sense is vital, but so is uncommon sense. The common sense of understanding the public and what it wants has been to survey visitors. In order to gain greater depth into the motivations behind survey responses, museums need to engage in some uncommon sense. The technique of interviewing "focus-groups" — relatively small sub-groups of respomdents interviewed in depth can reveal far more than short answers to pre-coded questions.

Museums, having such inportance for the economic, civic and educational quality of community life, are engaged in quite new ways with the communities they serve. Changes are certain, that to continue as museums respond to the needs of their expanded audiences and their changing communities.

9. Museums : A Place of Contemplation and Reflection :

There are nuseums, or spaces within many of them, designed for small numbers rather than crowds — the elegant halls of the Indian Museum, in Calcutta, the gentle lines and quite ponds in the Japanese Garden at the Missouri Botanical Garden in St. Louis, and the mediatative atmosphere of the Menil collection in Houston, produced by its diffused lightning. Museums are able to provide a place to rest from an increasingly hectic and media-driven world. While there are many problems facing museums now and in the future, we should focus not on the difficulties, but on the incredible opportunities that will engage museums as entirely new audiences gain access to the information and ideas housed in their collections and exhibitions. Museums should work together to share services, expertise, and collections, to increase their abilities to communicate with and actively engage the public.

Museums are social service providers, because they are spaces belonging to the citizenry at large, expounding on ideas, that information and stir the population to contemplate and occasionally to act. Museums are not unique in their work. Rather, they share a common purpose with a host of other institutions. We need museums & their siblings, because we need collective history, set in congregant locations in order to remain civilized. Societies build these institutions because they authenticate the social contract. They are collective evidence that were here.

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Local History : The Role of Libraries

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Abstract

Emphasized that local history should not be a mere adjunct of national history or simply a testing ground of overarching theories. To be worthwhile, it must primarily deal with the reconstruction of past local communities. From engendering awareness among readers to collecting and preserving materials, local libraries can play an immensely important role in history-writing. But such libraries must function not only as depositories of documents and books but also as museums housing local artifacts; only this will make them relevant to local populations and serve the purpose of creating self-consciousness among them.

Is local history really local?

Local history, like all other histories, has been used and abused. The study of history - simply, an account of the past - ought to be pursued to make sense of the present. There is, of course, a band of enthusiastic persons who study the past for its own sake. That has its own charm, but it reduces the study of history to antiquarianism, befitting only amateurs. On the other hand, although its scope has long moved beyond politics to embrace almost every aspect of human existence, history is never a mere collection of motley facts. Serious practitioners of the discipline hope to lay bare the past in order to seek the origins of the present-day situation, problems and all. They are, however, on their guard not to be too 'presentist' : as past people did not live with the sole intention of making the future, historians strive to reconstruct the past as it might have appeared to them. Nevertheless, historians assume that once it is known, a proper understanding of the present circumstances becomes possible to some extent; and, for people with knowledge of the yesteryears, life appears comparatively easier to live.

However, past events have not always been written of exactly as they occurred; quite often, historians have produced biased records of the past. The principal bias that many historians share, especially in an underdeveloped country like India that lacks sufficiently high levels of education and awareness, is elitism. This has influenced them, wittingly or unwittingly, to write the histories of the class(es) they belong to. This they do by selecting past material that they regard to be 'relevant', leaving behind in the process, other equally relevant materials and ignore alternative viewpoints. History, therefore, becomes the battleground of contending dominant classes and their ideologies. It has little effective use for those not belonging to the historians' class(es), for

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what often emerges out of the past are images, voices, and actions of only the elite, and those of others are conveniently ignored.

The practice of local history, too, is affected by this shortcoming. What I mean by this is that there are varieties of elitism, and in modern states that have a strong propensity towards centralization, history-writing invariably bears the stamp of centric elitism. This has affected the practice of local history in at least two different, at the same time interrelated, ways. First, a preoccupation with the nation and its affairs has reduced local history to a mere adjunct of national history. More often than not, historians concerned with writing national histories have turned to the locality only with the intention of 'ascertaining certain facts about the history of [the nation] by the minute examination of those areas smaller than the realm that combine to make the realm'.[1] In India, this has taken a curious turn where 'after independence, the somewhat obsessive pre-occupation among historians with nationalism during British rule has been to some extent responsible for the relative neglect of local history'.[2] Second, 'local historians' have quite often selected material from the locality-level to suit their ideological preferences, thus treating localities as only testing grounds of their assumptions. What result from this, therefore, are mere variants of 'history from above'. An example would be the Cambridge school of historians that, bent upon quashing the conventional Nationalist-Marxist characterization of the Indian freedom movement wrong in an era of Cold War and decolonization, gathered huge amounts of local evidence, intending to prove that resistance at that level made it impossible for British imperialists to penetrate fully, and that they ruled only because the Indians allowed them to, in lieu of the loaves and fishes of life.[3]

A case for local history

My contention is that if history - in this case, local history - has to be nearer the truth, it has to be rid of its centrist-elitist bias. It has to be countered with an alternative; in other words, it has to be written from the point of view of the local people (better still, if it could be written by local people themselves). The idea is to draw a distinction between 'national history localized' and 'local history per se'. The writing of local history, shorn of bias, will thus become the story of the origin, growth, transformation (and maybe, decline) of a community, 'a set of people occupying an area with defined territorial limits and so far united in thought and action as to feel a sense of belonging together, in contradistinction from the many outsiders who do not belong'.[4] It should not ignore the outside world, however, as no community can be said to be totally impervious to

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1 R. B. Pugh, *How to Write a Parish History*, London, 1954, p.9.

2 Bhaskar Chakraborty, 'Writing Local History: Some Problems', *Sthanik Itihas, Chabbish Pargana*, Rajpur, 2001, p.8.

3 See, for instance, Anil Seal, *Emergence of Indian Nationalism*, Cambridge, 1968.

4 H. R. P. Finberg, 'Local history', in H. R. P: Finberg (ed.), *Approaches to History*, London, 1962, p.117. See also Bhaskar Chakraborty, *op cit*, p. 11.

external influence. This rather broad definition of a community may be said to include an entire nation, but so does it fit many smaller social aggregates, both rural and urban. Communities, after all, possess multiple identities; the task of the historian is to demonstrate that larger concerns like that with the nation usually lie dormant, and in day-to-day living it is the locality situation that appears more real.

This again raises two problems. First, although educated Indians, ever since the nineteenth century, have shown commendable enthusiasm to produce numerous local histories, they reveal an absence of awareness of a central theme of the kind indicated above. Without a key theme, therefore, such histories have lacked any coherent narrative and have become merely huge compilations of local data. Of course, laymen are not expected to be trained in the historical method; this, in fact, makes imperative the stepping in of historians to take care of the task. Second, and more important, can history ever be rid of its elitist bias? After all, elites abound everywhere, even in the smallest of communities. So, the influence of the predominant classes in local society - their role in its growth and functioning - will most invariably leave its imprint on the writing of local history. My answer to this is that an awareness of this pitfall should go a long way in avoiding the danger that it poses. Also, too much should not be made out of it, for in every society a minority plays a role that sets it apart from others, and if this is true then this role should be faithfully recorded to get an accurate picture of society. More important, local societies, being 'secluded' communities (especially so in the past), have to subsist on interdependence among members sharing a common tradition that often overrides internal differences. If a historian portrays this shared tradition and the consequent commonly pursued lifestyle, he will have overcome much of the problem of elitism at the local level.

A role for local libraries

In the collection and preservation of source-materials for local history, libraries have an immensely important role to perform. A library may be said to be as good as only the community it serves; in other words, the quality of the stock of a library and its services are determined largely by the demands of the people using it. And yet, a local library can be a historian's favourite, too. But, in order to be so, it has to play an educator's role in its locality in the first place: it has to enthuse people about the history of their locality, encourage them to search for sources, and persuade them to hand their finds over to the library for proper preservation. Needless to tell, institutional rules forbidding and funds not pouring forth, here librarians have to take the initiative personally and collectively. For instance, researchers like libraries that function as referral centers; hence, librarians will have to create databases of libraries in their regions, complete with brief descriptions of holdings. Also, all librarians must keep faithful records of books purchased and borrowed since inception; such lists help historians to write about the reading habit of a local population at any period of time, which in turn contributes towards the reconstruction of the cultural history of the area. There is no end to what librarians can do with a little imagination and

some good intention; they have only to realize that historians, who are among the heaviest users of libraries, value resourceful libraries much more than the run-of-the-mill sort.

What are the possible sources of local history that a library may collect? W. G. Hoskins, in his excellent work on the practice of local history in England, lists the following sources on the subject: local directories, census schedules and reports, old newspapers, reminiscences, printed and manuscript records, parliamentary papers, maps, land tax assessments, illustrations, diaries, letters, account books, auctioneers' catalogues, and sales notices, and so on.[5] In India, where local history (in the sense that I have tried to define above) has not really caught the imagination of established historians, there exists no such seminal work that local history enthusiasts, including librarians, may refer to. [6] However, for two reasons books such as Hoskins' are unsuitable to be followed fully in this discussion: the sources mentioned are either for historians to look up and not possible for librarians to collect (e.g. parliamentary papers) or they are hardly available in this country (e.g. town directories). In the absence of any standard reference work on the subject then, here are some homespun suggestions that librarians might find useful. They must, of course, remember that historians differentiate between primary source materials or records created at the time of an occurrence and secondary sources or any interpretative material based on primary source materials. Wherever possible, I have mentioned sources for the local history of Medinipur.

First, traditional Indian literature (reprints of which are readily available), because they contain references to places, and social groups and their practices, are valuable in the ascertaining the formation and character of local societies of the past. Niharranjan Ray's classic work on the early history of Bengal is based to a great extent on this kind of literary source. Rajat Kanta Ray, who recently challenged his thesis on the origin of the Bengalis, reinterpreted the *charyagitis,* the manuscripts of which Haraprasad Shastri discovered in Nepal in the late nineteenth century.[7] Indeed, no historian writing on pre-modern Bengal can ignore the voluminous *Mangalkavya* literature created between the fifteenth and the eighteenth centuries, current editions of which are readily available. Alongside, locally published modern literature should be stocked too, as it mirrors modern society and its moods. The present is constantly shifting into the past, and a separate sub-discipline called contemporary history has already emerged as an important area of historical research. For Medinipur, a recent survey lists around 1750 literary publications between

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5 W. G. Hoskins, *Local History in England,* London & New York, 3rd edition, 1993, pp.32-48, and *passim.* Also see Michael A. Williams, *Researching Local History,* London & New York, 1996, pp.42-70, and *passim.*

6 Local librarians may go through Nancy C. Cridland, 'History', in Patricia A. McClung (ed.), *Selection of Library Materials in the Humanities, Social Sciences, and Sciences,* Chicago, 1987, especially the section on local history, but will face problems that I have mentioned above.

7 Niharranjan Ray, *Bangalir Itihas Adi Parva,* Calcutta, 1356 B.S.; Rajat Kanta Ray, 'Bangali: Ke, Kobe Evam Keno', *Desh,* 11. 11.2000.

early 19th and late 20th centuries.[8]

Second, equally important are old official reports and surveys; both Mughal and British states being highly centralized and bureaucratic structures, gathering and classification of knowledge about local conditions became imperative for the rulers. Thus, there is the *Ain-I-Akbari* that may well be called the first all-India gazetteer, and such publications as *A Statistical Account of Bengal* and the *Bengal District Gazetteers.*[9] Translations and reprints of these are easily available, too. *Third,* census handbooks and municipal publications may be considered to fall in the same category as the above. Nowadays, reprints of even the earliest censuses are being brought out. Publications such as *Calcutta Municipal Corporation at a Glance,* containing a wealth of material, are especially helpful as such information are not readily accessible to all.[10] *Fourth,* nowadays there are few good history books that do not begin with a chapter entitled, say, 'The Land and the People'. Historians rely on old maps indicating changing river courses, shifting forest zones, and receding coastlines to study land usage and human settlement patterns, among other things. Very recently, Muhammad Yasin Pathan, who did a remarkable job in arousing local interest and government action to restore the ancient temple-complex at Pathra in West Medinipur, has drawn up a detailed map for more than a thousand temples, mosques, churches, and fortresses of the undivided district that are more than a hundred years old.[11]

Fifth, local histories, although written by amateurs and lacking in methodological rigour, nevertheless are not to be neglected. Containing a wealth of information, they often provide historians with the raw material to construct local history; moreover, such material may well have vanished since last sighted by the antiquarian. Also, because these histories are usually compiled by local inhabitants, they are largely based on folk and oral evidence that often elude outsiders.[12] Unfortunately, neglect of local history in India has meant that there is no complete bibliography of such works. One bibliographical effort, for instance, lists only thirty-two entries for Medinipur, whereas the actual number could well be double that number and constantly increasing.[13] Local libraries could fill this gap by collecting published histories of their areas. Librarians have to be aware that local history monographs are usually brought out by small and offbeat publishers, and

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8 Bijoy Pal, 'Medinipurer Granthapanji', *Saraswat Sadhanay Medinipur,* Medinipur, 2001, pp.558-592.

9 Abul Fazl, *Ain-I-Akabari,* (ed.) H. Blochman, Calcutta, 1867-77; W. W. Hunter, *A Statistical Account of Bengal,* London, 1876; and, for instance, L. S. S. O'Malley, *Bengal District Gazetteers. Midnapore,* Calcutta, 1911.

10 P. T. Nair, *Calcutta Municipal Corporation at a Glance* (A CMC Publication), Calcutta, 1989.

11 Interview with Md. Yasin Pathan on 2.1.2003. See also his *Mandirmay Pathra,* Medinipur, 1993.

12 Gautam Bhadra makes this point in his foreward to Ranjan Bandopadhyay et al (ed.), *Baranagar Itihas O Samiksa,* Calcutta, n.d.

13 Paschim Bangla Akamedi, *Banglabhasay Itihas Charcha Granthapanji,* Calcutta, 1998, pp. 160-163. I myself possess a number of local histories of Medinipur that do not find mention in this bibliography. See Tarapada Santra, *Itihaser Ruprekha: Gram Janasampad,* Calcutta, 2002, for a more uptodate list.

quite often by their writers themselves personally. Moreover, at least some modern research can surely be found that have shaken off the centric influence to faithfully empathize with past local societies; for Medinipur, the many works of Hiteshranjan Sanyal and Tarapada Santra may be cited to be belonging to this genre.[14] Librarians need not be chary of collecting histories of places outside their areas, for local history is not necessarily written locally.

Sixth, another extremely valuable source for the reconstruction of earlier societies is old newspapers and journals. These are obviously more likely to exist in the larger towns, but not totally unlikely for smaller towns to possess. Newspapers readily provide a wealth of information about the topographical changes, social tensions, cultural activities, and economic matters of small towns that are unlikely to be found in national or regional dailies; however, to what extent they will mirror local politics will depend on the level of political consciousness and participation of the people of the area.[15] Often, however, both proprietors and libraries neglect to preserve locally published newspapers; for instance, the District Library at Medinipur does not stock newspapers published in the town, let alone those of other places in the district. Journals, on the other hand, through both fictional and non-fictional literature, reveal the local mind and preoccupation at different times. They also contain numerous articles on different aspects of local history written by serious amateurs. According to one estimate, between 1851 and 1999 Medinipur district saw the publication of 170 newspapers, 102 various other periodicals, 655 literary journals, and 31 children's magazines.[16] Serious librarians may have to tap personal and organizational sources to hunt these down.

Seventh, social and commercial organizations often bring out journals that are equally precious as sources of local history. Many caste associations have their own journals that help to learn about social aspirations and social mobility in an area. For instance, the Bankura Jela Tambuli Samaj, an important caste organization of southwestern Bengal, has been publishing *Samaj Darpan* since 1995.[17] Puja committees, too, have the custom of bringing out pamphlets and commemorative volumes that allow historians a peep into societies of bygone days. One such pamphlet published very recently to commemorate the hundredth year of a renowned Durga Puja of Medinipur town recounts how it was begun during the turbulent Swadeshi days to serve

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[14] Hiteshranjan Sanyal, *Swarajer Pathe,* Calcutta, 1995; Tarapada Santra, *Medinipur: Samskriti O Manabsamaj,* Haora, 1987.

[15] This is what Smt. Aparnita Bhattacharya of Garhbeta College, Medinipur, working on newspapers of the district, found to her dismay. Interview with her on 31.10.02.

[16] Dipankar Das, 'Medinipur Jelar Patra-Patrika (1851-1999)', *Saraswat Sadhanay Medinipur,* op cit, pp.390-484.

[17] See Soma Khan, 'Daksin Paschim Bangay Tambuli Samajer Utsya Sandhane', paper read at the 18th conference of the *Paschim Banga Itihas Samsad,* Calcutta, 24-26 January, 2002. Interview with her on 13.11.02.

the nationalists, then under official surveillance, as a convenient meeting-place.[18] Likewise, the voice of a local trading community to be found in their charters and pamphlets often helps a historian to reconstruct the trends in the local economy and the concomitant social structure. *Eighth,* educational institutions bring out journals regularly, and also occasional 'souvenirs', that may be collected by local librarians without much difficulty. They often reflect the social context of education (a new area of historical research) of a locality in a way that is not found in official reports and newspapers; this is especially relevant for places like Medinipur that have a history of modern education that is more than a hundred years old. Also, the journals published annually by the different departments of Vidyasagar University contain numerous research articles done on, and in, this part of the country.

Ninth, personal collections of books, newspapers, journals, *panjis* (almanacs), photographs, genealogical tables, and especially reminiscences in the form of diaries - all primary sources that are of the greatest value to local historians - maybe rescued from oblivion by inquisitive and energetic librarians. Quite often persons inheriting such collections find no use for them and yet hold on to them simply out of respect for the departed; there is no reason why they should not donate them to local libraries if assured of proper safekeeping. Memories of old people are notoriously faulty, but a well-informed elderly person can often give historians a view of the inner society of a place that may never be got from any printed, especially official, record.[19] Mention may be made here of a small local library, Hemchandra Pathagar at Rajbalhat in the district of Hoogly that holds letters of such eminent personalities as Rabindranath Tagore, Haraprasad Shastri, Prafullachandra Ray, Albert Einstein, and Jawaharlal Nehru, as also diaries of Jagadishchandra Bose. It is sad that quite often such rich collections leave localities and even the country due to dearth of interest and proper depositories.

Tenth, it would do librarians great credit if they ferreted out the innumerable *punthis* (manuscripts) that continue to lie with rural families across India. Their holders, totally unaware of the importance of such material in the reconstruction of past societies and cultures, neglect them to a pathetic degree; recently, a gentleman found a number of them being worshipped alongside idols in a household in Raybad village in East Medinipur, and it took quite some persuasion before the owner agreed to part with them even temporarily.[20] The excellent collection of old manuscripts by Panchanan Mandal of Santiniketan have become classics in its own right .[21] In

[18] *Colonelgola Adi Sarbajanin Durgotsav Samiti 68th Year 1409 B.S.* pamphlet is in my possession.

[19] Sumit Sarkar used unpublished papers and diaries of several local-level leaders to show how different mofussil swadeshi was from metropolitan politics; see his *Swadeshi Movement in Bengal,* Delhi, 1973. Tapan Sen of Bankura, holds about twenty-five volumes of his father's diaries that I am using to reconstruct the world-view of a small town dweller in the 1940s and 1950s.

[20] Kshitish Santra, 'Ekti Talpatar Punthi: Kapilamangal', *Apanjan Sharadiya,* Haldia, 1409 B. S., pp.107-116.

[21] See his *Punthi-Parichay,* 4 volumes, Calcutta, 1358 B.S. onwards. See also his *Chithipatre Samajchitra,* 2 volumes, Calcutta, 1359 B.S.

fact, many small museums attached to local libraries have built up extraordinary collections of such manuscripts mainly through individual effort; the Bangiya Sahitya Parishad at Bisnupur is said to contain over five thousand punthis, many of which were collected by the indefatigable Maniklal Singha.

Finally, there is no reason why local libraries should restrict themselves to collecting only books and other documents. Our small towns and the countryside are still strewn with innumerable artifacts that reflect local culture, and yet most of them go unnoticed and invariably perish with time. The reasons for this abject neglect are many: lack of awareness in the average local person of the importance of the preservation of such objects, the apathy of the educated urbanites who rarely look beyond their own milieu, lack of government interest and funds, lack of proper knowledge about preservation and exhibition techniques among local collectors, and last but not the least, lack of initiative among local librarians. It is not hard to imagine that such artifacts are best collected and preserved locally, and if librarians shed the inhibition that developes from their formal training they will have a larger and a very commendable role to play. The librarian and the museum curator should be the closest of the colleagues and in the sphere of local history at least there should be constant co-operation and consultation. Tarapada Santra has shown, with a wealth of detail, how enthusiastic persons have taken pains, with little government support, to develop the local library-cum-museums that lie across West Bengal.[22]

A last word

The above discussion has been done from the point of view of history and historians; the perspective, therefore, differs from that of library scientists. Librarians, it appears, are increasingly focusing more on the gathering of current information and its modes; in their scheme of things history finds very little space.[23] The latter approach has its uses, no doubt. For instance, it has a 'sound business reason' help as it might to attract high finance and technology to the peripheries and tourists to little known localities. But, to my mind, history would be boring if it were written only for business reasons. Primarily, it ought to be written to provide people with a common reference point in the past that will help them to feel related and join community endeavours with some sense of purpose. As Michael A. Williams says, '[the] attempt to achieve connection with the past has importance because ...[it] is the same as becoming fully aware in the present'.[24] And this is especially important today when, with familiar landscapes disappearing and old communities dissolving continuously, a person sometimes has the sudden uncanny feeling of existing in nowhere. History, then, might provide some solace.

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[22] Tarapada Santra, 'Paschimbanger Kshudra O Gramin Sangrashala: Ekti Samiksha', *Aitihasik,* 6/2, 1997, p.171.

[23] See, for instance, Juran Krishna Sarkhel, 'A Generalized Framework for the Design and Development of an Area Profile', *Vidyasagar University Journal of Library and Information Sciences,* volume 5, 2000, pp. 3-16. This has its adherents among others, too: note the word *Samiksa* in the sub-title of Ranjan Bandopadhyay et al (ed.), *op cit.*

[24] Michael A. Williams, *op cit,* p.265.

Taxonomy of Metadata Schema for Digital Repositories

*Ms. Renu Seth**

Abstract

Paper gives an overview of metadata and of various metadata schemas. It discusses the roles of metadata and its functions for description and resource discovery in digital repositories. Further the paper attempts to categorize the available schema and arrive at a taxonomy of metadata schema. An attempt has been made to extensively survey, study and include the various metadata schemas under the taxonomy.

1. Metadata : An overview

The word metadata has come to be used as a definition or description of data: a small indicator that encompasses and points to a larger piece of information. So, "metadata is a succinct and systematic set of information that references, and can be used to efficiently and accurately retrieve, a larger set of information" [1]. Metadata, literally "Data about Data", is an increasingly ubiquitous term that is understood in different ways by the diverse professional communities that design, create, describe, preserve and use information systems and resources [2]. Perhaps a more useful way of thinking about metadata is as the sum total of what one can say about any information object at any level of aggregation.

Library metadata development has been first and foremost about providing intellectual and physical access to content. Library metadata includes indexes, abstracts, and catalog records created according to cataloging rules and structural and content standards such as MARC, as well as authority forms such as LCSH. However, for digital object repositories and online resource discovery and maintenance there are many types of metadata schemes followed. Basically there are five main types of metadata [3] :

a) ***Descriptive metadata:*** describes a resource for purposes such as discovery and identification. It can include elements such as title, abstract, author, and keywords.

b) ***Structural metadata:*** indicates how compound objects are put together, for example, how pages are ordered to form chapters.

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c) ***Administrative metadata:*** provides information to help manage a resource, such as when and how it was created, file type and other technical information, and who can access it. There are several subsets of administrative data; two that sometimes are listed as separate metadata types are:

d) ***Rights management metadata:*** which deals with intellectual property rights,

e) ***Preservation metadata:*** which contains information needed to archive and preserve a resource.

2. Metadata : Role

As the communities and also repositories and information and communication technologies come together to make the information age a reality, it is essential that we understand the critical roles that the metadata can play in the development of effective, authoritative, interoperable, scaleable, and preservable cultural heritage information and record keeping system. Metadata is critical in personal information management and for ensuring effective information retrieval and accountability in record keeping.

A primary function of metadata is resource discovery; metadata increases the odds that a user will be able to retrieve appropriate information and assess its usefulness and availability. Metadata serves the same function in resource discovery as good cataloguing does by allowing resources to be found by relevant criteria, identify resources, bringing together similar resources, distinguishing dissimilar resources and giving location information [4].

In short, in an environment where a user can gain unmediated access to information objects over a network, metadata [2]:

1. certifies the authenticity and degree of completeness of the content;
2. establishes and documents the context of the content
3. identifies and exploits the structural relationship that exists between and within the information objects.
4. provides a range of intellectual access points for an increasingly diverse range of users
5. provides some of the information an information professional might have provided in a physical reference or research setting.

3. Metadata Schemas

Many different schemas are being developed in a variety of user environments and

disciplines. To be faced with a document collection and not to be able to decide which metadata schema should be used is a problem. In this paper it is attempted to arrive at a taxonomy or categorization of metadata standards dealing different types of resources, so that the metadata dealing with similar kind of information comes together. The benefit of this approach is that it allows related metadata standards to be grouped together and this categorization makes accessibility for the users really easy and to provide a categorization at one place to indicate what schema are available and the respective purview. There is a plethora of Metadata schemas available for various digital collections, objects etc but there is as yet no single standard for metadata, although various groups, both library and non-library related, are working furiously to develop one [5].

A study of the existing schema leads to a broad categorization presented below :

- Resource Discovery/Description Metadata Initiatives
- Multimedia object description metadata schema
- Learning objects description and discovery schema
- Government Information Metadata schema
- Metadata standards for Thesis and Dissertations
- Museum and artwork metadata schema
- Preservation and Archival Metadata Initiatives

3.1 Resource Discovery/Description Metadata Initiatives

Resource discovery metadata serves the same function as good cataloguing. It facilitates, identification of the resources and also provides information about the location of the same. Resource discovery metadata facilitates the classification of Internet resources using various element sets for structuring the information about a source in a way that describes, explains locates or otherwise makes it easier to retrieve the resources. There are various resource discovery metadata standards available, some of which are listed below :

3.1.1 Dublin Core Metadata Initiative

The Dublin Core Metadata Initiative (DCMI) [6] is an organization dedicated to promoting the widespread adoption of interoperable metadata standards and developing specialized metadata vocabularies for describing resources that enable more intelligent information discovery systems. The mission of DCMI is to make it easier to find resources using the Internet through the following activities :

1) Developing metadata standards for discovery across domains,
2) Defining frameworks for the interoperation of metadata sets, and,

3) Facilitating the development of community- or disciplinary-specific metadata sets that are consistent with items 1 and 2

The range of activities of DCMI includes: Standards development and maintenance, Tools, services, and infrastructure, including the DCMI metadata registry and Educational outreach and community liaison. Ongoing efforts of DCMI participants include the collaborative development and continual refinement of metadata conventions based on research. Dublin core has a core list of 18 metadata elements, all the elements are optional and are reapeatable and they can be further refined with the help of qualifiers. Because of its simplicity DC element set is being used by being by many outside the library community.

3.1.2 Metadata Encoding and Transmission Standard (METS)

Metadata Encoding & Transmission Standard [38] is a standard for encoding descriptive, administrative, and structural metadata regarding objects within a digital library, expressed using the XML schema language of the World Wide Web Consortium. METS was developed to fill the need for a standard data structure for describing complex digital library objects.

3.1.3 Metadata Object Description Schema (MODS)

Metadata Object Description Schema (MODS) [7] is a descriptive metadata schema that is a derivative of MARC 21 and intended to either carry selected data from MARC 21 or enable the creation of original resource description records. It includes a subset of MARC fields and uses language based tags rather than the numeric ones used in MARC 21 records, in some cases regrouping elements from the MARC 21 bibliographic format. Like METS, MODS is expressed using the XML schema language. As an XML schema it is intended to be able to carry selected data from existing MARC 21 records as well as to enable the creation of original resource description records. MODS is intended to complement other metadata formats.

3.1.4 Metadata Authority Description Schema (MADS)

Metadata Authority Description Schema (MADS) is an XML schema for an authority element set that may be used to provide metadata about agents (people, organizations), events, and terms (topics, geographies, genres, etc.). MADS [8] was created to serve as a companion to the Metadata Object Description Schema (MODS). MADS is a MARC21-compatible XML format for the type of data carried in records in the MARC Authorities format. Each individual record is contained within <mads></mads>, and groups of MADS records can be contained within a MADS Collection (<madsCollection></madsCollection>).

3.1.5 Encoded Archival Description (EAD)

EAD was developed as a way of marking up the data contained in finding aids so that they can be searched and displayed online. In archives and special collections, the finding aid is an important tool for resource description. Finding aids differ from catalog records by being much longer, more narrative and explanatory and highly structured in a hierarchical fashion. They generally start with a description of the collection as a whole, indicating what types of materials it contains and why they are important [9, 10].

3.1.6 Text Encoding Initiative (TEI)

The Text Encoding Initiative (TEI) [11] is an international and interdisciplinary standard that facilitates libraries, museums, publishers, and individual scholars to represent a variety of literary and linguistic texts for online research, teaching, and preservation. The TEI standard is maintained by a Consortium of leading Institutions and Projects worldwide. The TEI encoding scheme consists of a number of modules or *DTD fragments* which are referred to as *tag sets*. Selected tag sets may be combined in many different ways, according to principles, within the framework of the TEI *main DTD*. The TEI was founded in 1987 to develop guidelines for encoding machine-readable texts of interest in the humanities and social sciences. The goal of the TEI project was to "define a set of generic guidelines for the representation of textual materials in electronic form, in such a way as to enable researchers in any discipline to interchange and re-use resources, independently of software, hardware and application area". [12] As a well-established DTD, TEI has been used very widely, particularly in academic libraries, for creating digital texts, especially in the humanities, to insure a standardized format, with rich mark-up capabilities for indexing, and to facilitate the sharing of texts in library collections.

3.1.7 ONline Information eXchange (ONIX)

ONIX stands for ONline Information eXchange. It is an international standard for representing and communicating book industry product information in electronic form. It is a metadata standard developed by the publishing community as a standard means to exchange information about "book" product information electronically to wholesalers, retail booksellers, other publishers, and anyone else involved in the supply chain. ONIX was designed as a solution to two problems :

- the lack of consistency and standards in data exchange formats in use by book wholesalers and retailers and the need for a universal, international format in which all publishers could exchange information.
- the need for richer book data online since there is no physical book for the potential buyers to pickup and pursue on the Internet. [17]

3.2 Multimedia Metadata Initiatives

Although a lot of established resource discovery standards exist but they are not adequate to describe the structure and relationships between the multimedia objects like still pictures, graphics, 3D models, music, audio, speech, video or multimedia collections. The future will lead to many more compound multimedia documents on the web which combine text, image, audio and video in rich complex structured documents in which temporal, spatial, structural and semantic relationships exist between the components. The problems of indexing, archiving, searching, browsing and retrieving these kinds of structured dynamic documents are infinitely more complex than the resource discovery of simple atomic textual documents. Multimedia metadata initiatives are needed to enable the users to exchange, access, consume, trade and otherwise manipulate

The boundaries between the delivery of audio (music and spoken word), accompanying artwork (graphics), text (lyrics), video (visual) and synthetic spaces are becoming increasingly blurred [18]. New solutions are required for the access, delivery, management and protection processes of these different content types in an integrated and harmonized way, to be implemented in a manner that is entirely transparent to the many different users of multimedia services. To tackle this problem the following multimedia metadata standards have been developed.

3.2.1 MPEG-21 Multimedia Framework

MPEG-21 aims at defining a normative open framework for multimedia delivery and consumption for use by everybody in the delivery and consumption chain. This open framework provides content creators, producers, distributors and service providers with equal opportunities in the MPEG-21 enabled open market. MPEG-21 is based on two essential concepts:

1. the definition of a fundamental unit of distribution and transaction (the Digital Item) and
2. the concept of Users interacting with Digital Items.

MPEG-21 [18] identifies and defines the mechanisms and elements needed to support the multimedia delivery chain as well as the relationships between and the operations supported by them. At its most basic level, MPEG-21 provides a framework in which one User interacts with another.

3.2.2 Multimedia Content Description Interface (MPEG-7)

MPEG-7 [19] is an ISO/IEC standard developed by MPEG (Moving Picture Experts

Group), the committee that also developed the Emmy Award winning standards known as MPEG-1 and MPEG-2, and the MPEG-4 standard. MPEG-1 and MPEG-2 standards made interactive video on CD-ROM and Digital Television possible. MPEG-4 is the multimedia standard for the fixed and mobile web enabling integration of multiple paradigms.

MPEG-7, formally named "Multimedia Content Description Interface", is a standard for describing the multimedia content data that supports some degree of interpretation of the information meaning, which can be passed onto, or accessed by, a device or a computer code. MPEG-7 is not aimed at any one application in particular; rather, the elements that MPEG-7 standardizes support as broad a range of applications as possible.

3.2.3 VRA Core Categories, Version 3.0

The VRA Core Categories, Version 3.0 [28] consist of a single element set that can be applied as many times as necessary to create records to describe works of visual culture as well as the images that document them. The Data Standards Committee followed the "1:1 principle," developed by the Dublin Core community, i.e., only one object or resource may be described within a single metadata set. How the element sets are linked to form a single record is a local database implementation issue. The order of the categories in the VRA Core 3.0 is arbitrary, and local implementations are encouraged to determine their own field sequence that will appropriately describe their data.

3.2.4 Public Broadcast Metadata Dictionary (PBCore v 1.0)

The PBCore [24] (Public Broadcasting Metadata Dictionary) was created by the public broadcasting community in the United States of America for use by public broadcasters and related communities. The PBCore is built on the foundation of the Dublin Core (ISO 15836), an international standard for resource discovery and has been reviewed by the Dublin Core Metadata Initiative Usage Board. PBCore is designed to provide—for television, radio and Web activities—a standard way of describing and using media (video, audio, text, images, rich interactive learning objects). It allows content to be more easily retrieved and shared among colleagues, software systems, institutions, community and production partners, private citizens, and educators.

3.3 Learning Object Metadata Initiatives

With the boom in online education, learning technology standards are critical to the success of this industry because with the help of these standards, it will be possible to mix and match content from multiple sources and to develop interchangeable content that can be reused, assembled, and disassembled easily. Metadata facilitates searching, management and linking

granules of content and enables learners, authors and others to search, retrieve and assemble reusable learning objects. Some of the well-known metadata standards for online learning are as follows:

3.3.1 Instructional Management Systems (IMS)

IMS [20] develops and promotes the adoption of open technical specifications for interoperable learning technology. Their Metadata information model is based on the IEEE LOM scheme with only minor modifications. The intention is to replace the IMS Learning Resource Meta-data XML Binding Specification with the IEEE 1484.12.3 Extensible Markup Language (XML) Schema Definition Language Binding for Learning Object Metadata to be approved in 2005. IMS/GLC specifications and their use in reference models like SCORM 2004 and national frameworks like the Electronic Government Interoperability Framework in the UK have helped to create a growing world-wide market for education and training related products and services."

3.3.2 IEEE Learning object Metadata

IEEE learning technology standards Committee (LTSC) developed the Learning Object Metadata (LOM) standard (IEEE 1484.12.1-2002) to enable the use and re-use of technology-supported learning resources such as computer based training and distance learning objects. The attributes of this metadata standard are grouped into eight categories [21]:

- General, containing information about the object as a whole:
- Lifecycle, containing metadata about the objects evolution;
- Technical, with descriptions of the technical characteristics and requirements.
- Educational, containing the educational/pedagogical attributes
- Rights, describing the intellectual property rights and use conditions;
- Relation, identifying related objects;
- Annotation, containing comments and the date and author of the comments; and
- Classification which identifies other classification system identifier for the object.

3.3.3 The Gateway to Educational Material (GEM)

GEM [22] is a consortium effort sponsored by the U.S. Department of Education. In addition to Gateway access to educational resources on the web, GEM has developed a set of standards used world-wide for describing those resources. GEM has also developed tools to make creating resource descriptions simple. The GEM project provides a freely available set of tools for collection holders to prepare descriptions of their educational resources to be included in the GEM Gateway. GEM metadata is based on the Dublin Core elements, a widely implemented

and formally endorsed standard. Currently there are 21 GEM Metadata elements that are easy to use. GEM provides a metadata creation and editing tool (GEMCat).

3.3.4 Education Network Australia (EDNA)

EdNA (Education Network Australia) [23] is an Australian framework for collaboration on the use of the Internet in education and training. The EdNA Metadata Standard is based on the internationally recognized Dublin Core Metadata Element Set (DCMES) and is consistent with the Australian Government Locator Service (AGLS). The purpose of the EdNA Metadata Standard is to support interoperability across all sectors of education and training in Australia in the area of online resource discovery and management.

3.3.5 CanCore Learning Resource Metadata Initiative

Can Core is also a Learning Resource Metadata Initiative. It enhances the ability of educators, researchers and students in Canada and around the world to search and locate material from online collections of educational resources. CanCore is based on and fully compatible with the IEEE Learning Object Metadata standard and the IMS Learning Resource Meta-data specification. [25]

3.4 Government Metadata Initiatives

Government information is a critical resource not only for the common man but also for libraries, and many private academic and business institutions. Access to current past and future government records, documentation and publications by the general public will achieve transparency in the working of the governemnt and will enhance faith in the system. However, keeping in mind, the vast amount of material being produced by the government agencies all over the world, some standards need to be followed to preserve and digitize this information. Some of the well known metadata standards being used by the government agencies are:

3.4.1 Australian Government Locator Service (AGLS)

Australian Government Locator Service (AGLS) has been endorsed by all Australian governments and was issued as Australian Standard AS 5044 by Standards Australia in December 2002. The AGLS Metadata Standard is a set of 19 descriptive elements which government agencies can use to improve the visibility and accessibility of their services and information over the Internet.. The 19 elements have been grouped into three obligation or use categories. The categories and elements are:

- Mandatory: Creator, Date, Description, Title, Identifier or Availability, and Type.

- Conditional: Function, Subject, Publisher, Audience, Coverage and Language.
- Optional: Contributor, Format, Mandate, Relation, Rights and Source.

However, agencies are encouraged to use as many additional metadata elements as necessary in order to enhance the agency's resource description and maximise discovery. The elements that are particularly important to customer-focused portals in their delivery of browse lists and searches targeted to their customer groups are Title, Subject, Description, Coverage, Function, Audience, Type and Availability. [26]

3.4.2 US Government Information Locator Service (GILS)

The Global Information Locator Service (GILS) is a revolutionary new approach, enabling people to find and retrieve information easily even as information sources expand and diversify. Fundamentally, GILS is about managing information content, not just picking new information technologies. GILS is an open standard for searching basic information descriptions. As part of how an organization manages information content, these "locator records" give users inside and outside the organization a simple way to find information. Such descriptions may be inserted into Web documents with tools like TagGen, generated from databases with tools like MetaStar and Microsoft Access; or edited by catalogers and just stored as documents. [27]

Other notable government information standards are IMRC – Canada and e-GMS, United Kingdom

3.5 Matadata Standards for Description of Art Collection and /or Visual Resources

Museum all around the world house a rich collection of visual resources. The art works and artifacts offer a peek into the lost civilizations which the current generation can only visualize thro' the museums and art institutions. Hence there is a great need to digitize and preserve these resources. Although some museums are digitizing at archival standards for educational and research purposes, many are producing lower resolution and lower quality digital images of their collections only for online exhibits. Various projects e.g. Visual arts data service Archaeology data service etc are being undertaken all over the world to preserve as well as disseminate this kind of information. Metadata standards are being developed to digitize the art information and bodies like AMICO (Art Museum Image Consortium are playing an important role in facilitating collaboration between the Art collecting institutions. Some of the existing metadata standards for museum information are listed below:

3.5.1 Computer Interchange of Museum Information (CIMI)

CIMI (13, 14, 15) is a consortium of cultural heritage institutions and organizations. This consortium worked together to bring rich cultural information to the widest possible audience. Since its founding in 1990, CIMI was dedicated to encouraging the use of standards - finding the standard, creating consensus around it, testing it, and disseminating it to the museum community. CIMI DTD was created to encode museum specific information, such as exhibition catalogues. CIMI DTD uses TEI LITE as a base format, a starting point and then adds additional museum specific access points, such as materials and process technique. These standards for interchange of museum information were meant to cover the broad range of information of different types and structures such as structured texts, full text documents, and images offered by the museum communities.

3.5.2 Categories for the Description of Works of Art (CDWA)

The CDWA [16] is a product of the Art Information Task Force (AITF). The Categories describe the content of art databases by articulating a conceptual framework for describing and accessing information about objects and images. They identify vocabulary resources and descriptive practices that will make information residing in diverse systems both more compatible and more accessible. They also provide a framework to which existing art information systems can be mapped and upon which new systems can be developed. The Categories advise the use of controlled vocabularies, authorities, and consistent formatting of certain information to ensure efficient end-user retrieval.

3.5.3 RLG REACH Element Set

RLG REACH Element Set is the result of a project by the Research Libraries Group (RLG) to identify the core fields shared among existing data structure standards for museums. The REACH Element Set identifies the core fields shared among:

- CHIN Humanities Data Dictionary
- Categories for the Description of Works of Art (CDWA)
- CIDOC Information Categories
- CIMI Access Points
- Dublin Core
- mda standards
- Museum Educational Site Licensing Project (MESL) Data Dictionary

3.6 Initiatives for Electronic Dissertations and Thesis

Electronic dissertations and thesis are a very important part of the information and research community and access to this information in a structured manner is of utmost importance as in each part of the world similar topics are being researched and to avoid duplication of efforts also it is important that the research community is able to retrieve the information available in every part of the world. To achieve this, retrieval techniques need to be standardized and this is where metadata standards, play an important part. Some well-known metadata standards for the Electronic Dissertations and Theses are as follows:

3.6.1 XMetaDiss (Metadata Set of Die Deutsche Bibliothek for Online Dissertations and Post-Doctoral Theses, Including References to the Authors (XMetaPers))

XMetaDiss [29] is the initiative of the DDB, the national library of Germany. The basis for the data elements described in the XMetaDiss format is the Dublin Core Metadata Element Set. However, the Dublin Core Set does not meet all requirements considered necessary to exploit dissertations and post-doctoral theses. Therefore, within the Dublin Core range, the metadata set has been expanded considerably for the metadata set of the Networked Digital Library for Theses and Dissertations. ETD-MS (Electronic Theses and Dissertations Metadata-Set), for metadata for long-term preservation on the basis of the New Zealand National Library Preservation Metadata and for a set to register personal related data (XMetaPers).

3.6.2 NDLTD ETD-MS (Electronic Theses and Dissertations – Metadata Set)

ETD-MS [30] is a standard set of metadata elements used to describe an electronic thesis or dissertation. It is based on common Dublin Core metadata elements with a few elements specifically for theses.

3.6.3 Electronic Theses (E-Theses) Metadata Set

The UK recommended E-Theses metadata set has formed the basis for the Tapir's theses submission system's metadata collection section. This metadata set was developed in collaboration with the Robert Gordon University (Electronic Theses Project), the University of Glasgow (DAEDALUS) and the British Library [31].

3.7 Preservation Metadata Initiatives

Ensuring the long-term preservation of information in digital form is one of the greatest challenges for the information professional in the 21st century. The rapid growth in the use of computers and Internet has made it essential for us to come up with fool proof preservation

techniques to facilitate long term preservation of digital information. There has been growing awareness about the vital role that metadata can play in supporting the long-term preservation of digital objects. Preservation is integral to some definitions of metadata. For Example Cunningham defines it as " Structured information that describes and /or allows us to find, manage control understand or preserve other information over time" Some of the digital preservation metadata standards are listed below: [32]

3.7.1 Data Documentation Initiative (DDI)

The Data Documentation Initiative (DDI) [33] is an effort to establish an international XML-based standard for the content, presentation, transport, and preservation of documentation for datasets in the social and behavioral sciences. The DDI specification provides for full descriptions of the methodology of the study (mode of data collection, sampling methods if applicable, universe, geographical areas of study, responsible organizations and persons, etc.) in social & behavioral sciences.

3.7.2 Victoria Electronic Records Strategy (VERS) Metadata Scheme

VERS [34] is a solution to the problem of capturing, managing and preserving electronic records. VERS is a framework of standards, guidance, training, consultancy and implementation projects, which is centered around the goal of reliably and authentically archiving electronic records. The purpose of this Scheme is to define the metadata that may occur within a Victoria Electronic Records Strategy (VERS) Encapsulated Object (VEO).

3.7.3 PREMIS: PREservation Metadata: Implementation Strategies

PREMIS Working Group was set up by OCLC and RLG to develop a set of core metadata elements, which can have broad applicability in digital preservation repositories. With the following objectives PREMIS Working group outlined the data dictionary [35]:

- define an implementable set of "core" preservation metadata elements, with broad applicability within the digital preservation community;
- draft a Data Dictionary to support the core preservation metadata element set;
- examine and evaluate alternative strategies for the encoding, storage, and management of preservation metadata within a digital preservation system, as well as for the exchange of preservation metadata among systems;
- conduct pilot programs for testing the group's recommendations and best practices in a
- variety of systems settings; and
- explore opportunities for the cooperative creation and sharing of preservation metadata.

PREMIS had a practical rather than theoretical focus. PREMIS Data Dictionary is build upon Open Archival Information System (OAIS) reference model. However, some terminological differences are there between PREMIS and OAIS.

Apart from above mentioned categorization of metadata standards, there are many other metadata standards being developed by various agencies all over the world which are applicable in preservation of digitized information in all walks of life. For example Metadata standards for Description of Ethnological/Anthropological information (CIDOC) CIDOC International Core Data Standard for Ethnology/Ethnography, Geo-spatial Metadata Initiatives (CSDGM), e-commerce Metadata Initiatives (Indecs), Presentation Metadata Initiatives (MCF) and many others.

Conclusion

As discussed in the sections above, there is a plethora of metadata schemas and this basically questions the definition of a standard. If every repository is to have its own metadata schema or deviate from a standard, it defeats the purpose of a standard itself! Further the challenge arises in tools for digital repositories being able to handle these various formats. If they are as unique as (if not more) the various MARCs followed by library catalogues of the past then these will also be as alien to each other as the MARCs were. But interoperability being a main issue with digital repositories there should be a broad framework for a metadata schema, which could cater to the requirements of various digital repositories and their content.

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Use of FRBR as a Model for Bibliographic Description in Online Environment

*Parthasarathi Mukhopadhyay**

Abstract

This paper starts with discussion of scope, nature, organization and use of bibliographic data in various types of bibliographic records, analyzes scope of FRBR as model of bibliographic description and finally maps entities, attributes and relationships, as identified by FRBR, with four generic user tasks viz. find, identify, select and obtain. It also traces out the possible applications of FRBR as semantic model and data model in the development of standards, codes and principles of bibliographic description.

0 Introduction

Bibliographic data are generated by bibliographers, cataloguers, abstractors & indexers, publishers & booksellers and appear in a range of products, including but not limited to library catalogues, online databases, publishers & booksellers lists, abstracting & indexing services and bibliographies. The nature of bibliographic and cataloguing data appears to be identical, but bibliographic data have an independent existence and need separate consideration. Cataloguing in fact is one of the many applications of bibliographic data management. Haggler and Simmons (Hogler, R. and Simmons, P., 1982) define bibliographic data as "elements of information, which help to identify a piece of recorded communication as a physical object". They identified three types of functional data groups :

- Data that uniquely identify a particular document and distinguish it from others
- Data, which reveal an association of two or more documents (e.g. common authorship, continuation or reprint)
- Data, which describe some characteristics of the intellectual content of a document (e.g. statement of subject)

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Organization of bibliographic data elements leads to the creation of bibliographic records. Bibliographic record has been defined as the sum of all the areas and elements, which may be used to describe, identify or retrieve any physical item of information content. Bibliographic description is the assemblage of data elements sufficient to identify a bibliographic item and to distinguish it from others. In manual systems (e.g. card catalogue), a collection of bibliographic data elements are grouped under the main access points or headings as per the cataloguing code in use. Such record of an item in a catalogue is called an 'Entry'. Entries are usually identified by the kind of access they provide e.g. 'author entry' or 'subject entry'. The distinction between bibliographic record and entry is most visible in computerized environment where the master bibliographic record is stored in the machine and computer programmes generate entries from it. Dempsey (Dempsey, L., 1989) identified three groups of bibliographic dataset – bibliographic description and control data (data describing, identifying and providing controlled access to items), subject data and content description. The first two groups of data generally appear in library catalogues and bibliographic databases. They include :

- Data naming an item (e.g. title, alternative title)
- Data naming persons or bodies connected with the creation of an item (e.g. author, artist, cartographic agency)
- Data describing hierarchical, lateral or lineal relationships between items (e.g. component part, host item, numbering in series, companion item, name of earlier edition or version)
- Data indicating intellectual content (e.g. subject heading, abstract)
- Data naming persons or bodies connected with the production of an item as a physical object (e.g. publisher, designer)
- Data indicating form or nature of item (e.g. bibliography, documentary, novel)
- Data indicating mode of expression or communication (e.g. verbal, pictorial)
- Data describing the physical appearance, characteristics and constituents of an item (e.g. map, film, dimensions, number of volumes or parts, technical information needed for use)
- Data assigned by a bibliographic or other agency for purpose of identification and control (e.g. ISBN)

The above list shows that bibliographic description deals with two categories of data – data providing access and data describing items. The level and extent of bibliographic description depends on the application and purpose of bibliographic records.

1 Models of Bibliographic Description

The Paris Principles and ISBDs have served as the bibliographic foundation for almost all the national and international cataloguing codes. But during the last 20 years or so, the environment within which cataloguing principles and standards operate has changed because of the emergence of computerized processing of bibliographic data, growth of large-scale databases, increasing use of shared cataloguing programmes and proliferation of digital resources in Internet. Such a situation requires some general framework to assist in the understanding and further development of conventions for bibliographic description (Svenonius, E. 2000). Models for bibliographic description provide a logical base for the correlation of cataloguing rules with the data encoding structure. A model for bibliographic description endeavours to address complex bibliographic problems and provides a strong foundation to support future, integrated, advanced information retrieval, presentation and transfer systems. Functional Requirements for Bibliographic Records (FRBR) can act as semantic model and data model towards this end.

2 Functional Requirements for Bibliographic Records (FRBR)

FRBR is an entity-relationship model framed by IFLA in 1998. The model represents a generalized view of the bibliographic universe. The FRBR model

- Identifies the bibliographic entities and defines their nature and scope
- Analyses the attributes associated with each of the entities
- Provides a comprehensive listing of individual data elements associated with each attribute
- Delineates the nature of relationships that operate at a generalized level and between specific instances of entities
- Maps the attributes and relationships associated with each entity to four generic user tasks (find, identify, select, obtain)
- Recommends basic data requirements for national bibliographic records

The model could serve :

- As a framework for re-assessing data recording conventions and standards
- A role in normalizing bibliographic data
- To frame more economic means of data capture
- As a conceptual framework for re-examination of the structures used to store, display, and communicate bibliographic data
- As a tool for restructuring bibliographic record formats to reflect relationships

3 Bibliographic Entities, Attributes and Relationships in FRBR Model

This conceptual model is based on entity analysis technique to isolate key objects that are of interest to users of bibliographic records. The entity relationship structure derived from the analysis of bibliographic entities, attributes and relationships has been used in FRBR as the framework for assessing the relevance of each attribute and relationship to the tasks performed by users of bibliographic data.

3.1 Entities

In FRBR model, the entities of bibliographic universe have been divided into three groups :

- The first group includes the products of intellectual or artistic endeavour
- The second group comprises those entities responsible for the intellectual or artistic content
- The third group identifies entities that serve as the subjects of intellectual or artistic endeavour

Group I Entities

The entities of this group represent the different aspects of user interests in the products of intellectual or artistic endeavour. These are :

- *Work: A distinct intellectual or artistic creation*
- *Expression: The intellectual or artistic realization of a work*
- *Manifestation: The physical embodiment of an expression of a work*
- *Item: A single exemplar of a manifestation*

The first two entities reflect intellectual or artistic content and last two entities reflect physical forms. Figure 1 represents the relationships between entities of the first group as given in FRBR :

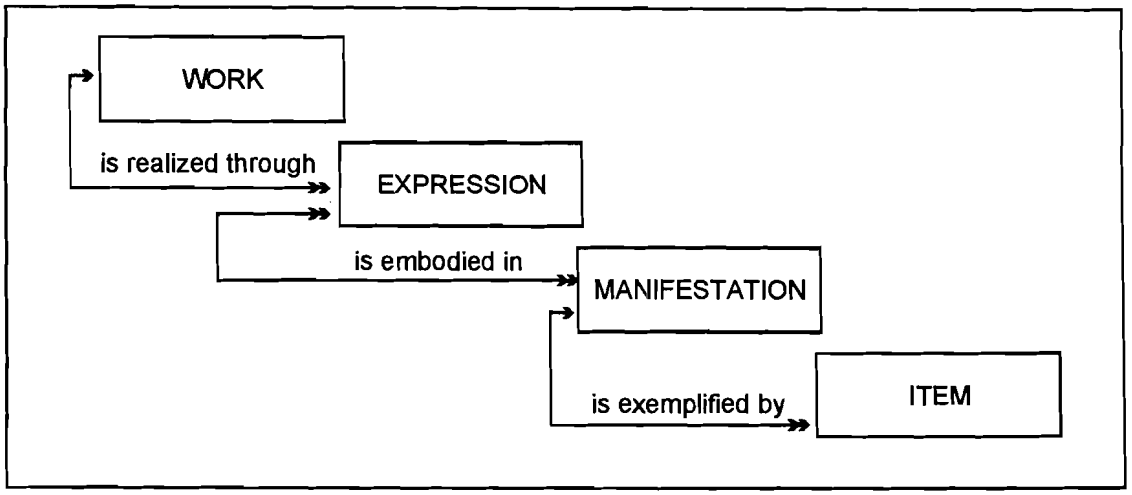


Figure 1: Group 1 Entities and Primary Relationships
(Reproduced from FRBR document)

The above diagram shows that a *work* may be realized through one or more than one *expression* (thus the double arrow on the line that links *work* to *expression*). On the other hand, an *expression* is the realization of one and only one *work* (hence the single arrow on the reverse direction of that line linking *expression* to *work*). An *expression* may be embodied in one or more than one *manifestation.* Similarly, a *manifestation* may embody one or more than one *expression*. A *manifestation*, in turn, may be exemplified by one or more than one *item*; but an *item* may exemplify one and only one *manifestation*.

Group II Entities

The entities in the second group represent those responsible for the intellectual or artistic content, the physical production and dissemination, or the custodianship of the entities in the first group. The entities in this group include *person* (an individual) and *corporate body* (an organization or group of individuals and/or organizations). The type of "responsibility" relationships that exist between entities in the second group and the entities in the first group may be represented as in figure 2.

Group III Entities

The entities of this group represent an additional set of entities that serve as the subjects of *works*. It includes *concept* (an abstract notion or idea), *object* (a material thing), *event* (an action or occurrence), and *place* (a location). *Figure 3* shows the "subject" relationships between

entities in the third group and the *work* entity in the first group and also relationships between *work* and the entities in the first and second groups. The diagram indicates that a work may have as its subject one or more than one *work*, *expression*, *manifestation*, *item*, *person*, and/or *corporate body*.

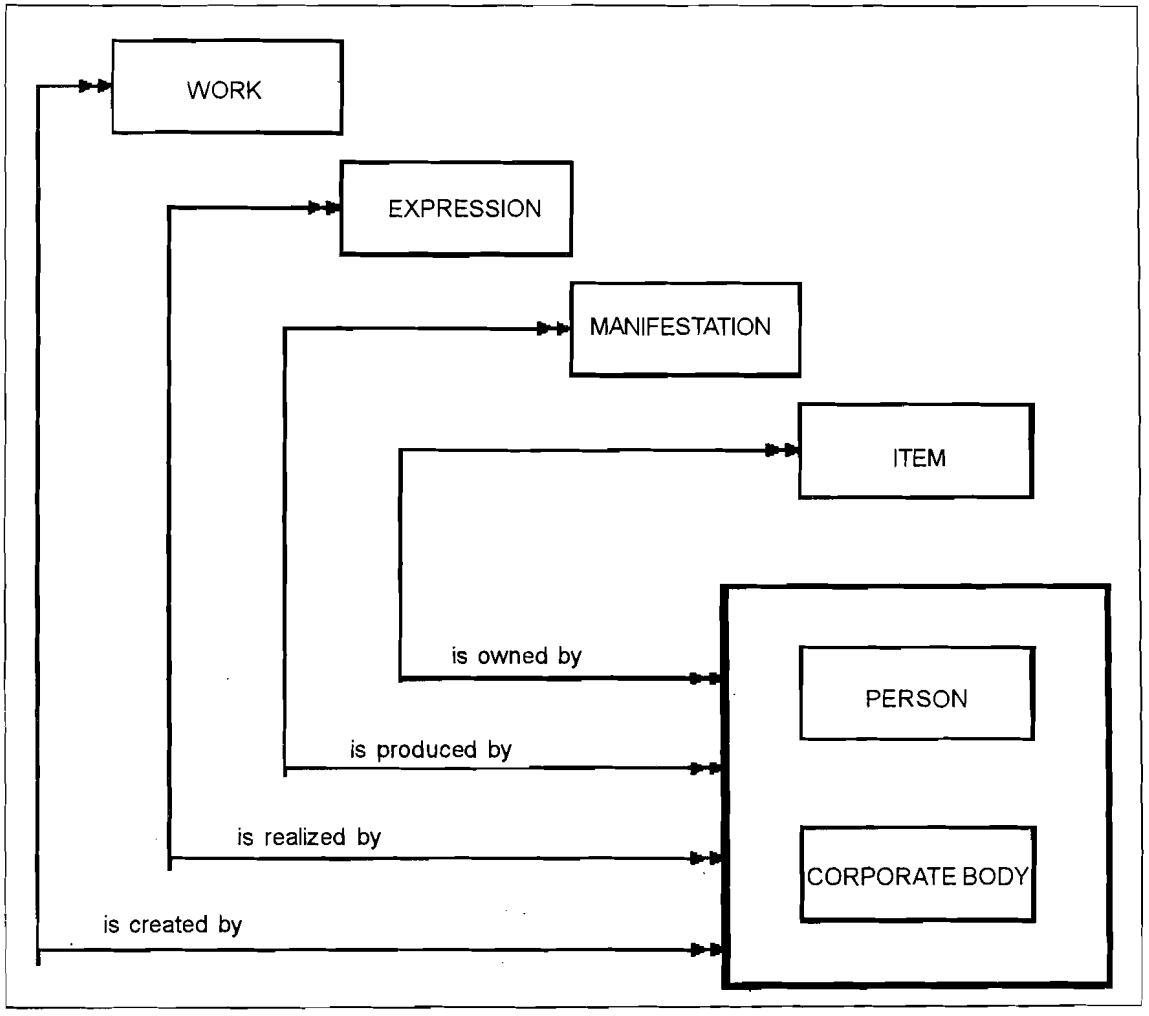


Figure2: Group 2 Entities and "Responsibility" Relationships
(Reproduced from FRBR document)

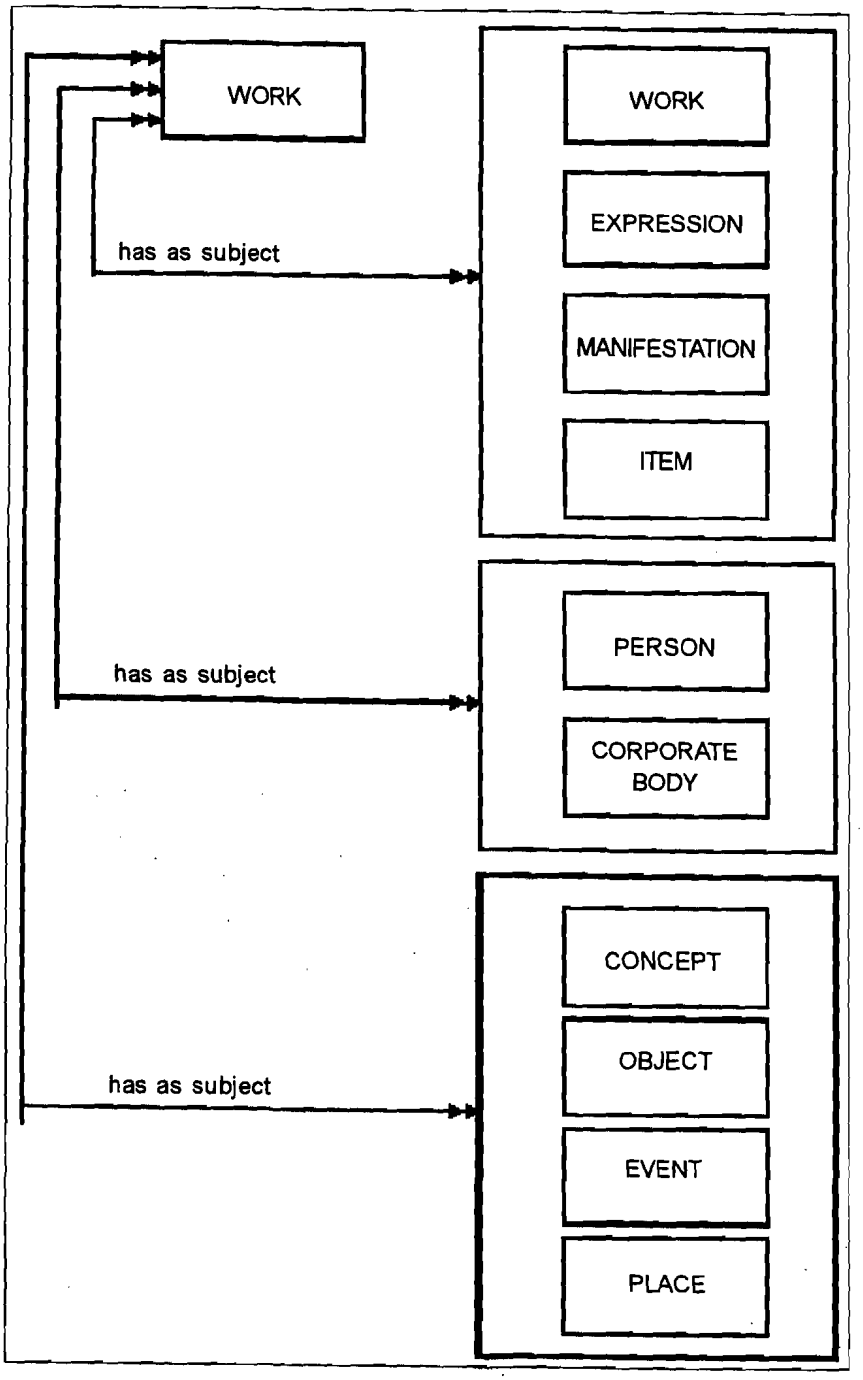


Figure 3: Group 3 Entities and "Subject" Relationships
(Reproduced from FRBR document)

3.2 Attributes

Each of the entities, as proposed by FRBR model is associated with a set of characteristics. These are called attributes of an entity and serve as the means to satisfy users queries at the time of seeking information about a particular entity. The attributes of bibliographical entities may be derived by logical analysis of bibliographic data elements reflected in bibliographic records. FRBR model identified attributes by analyzing existing standards of bibliographical description (ISBDs, GARE, GSARE) and content designator schemes (UNIMARC). Attributes of entities in different groups are listed in three tables as annexure 2.

3.3 Relationships

Bibliographic relationship exists when bibliographic entities are associated with each other in some way. A catalogue or bibliographic database serves dual purposes:

- Identification and location of specific items (identifying and finding function)
- Identification and location of related items (collocating function)

Bibliographic relationships perform the collocating function of a catalogue or bibliographic database. UNIMARC identified three categories of relationships:

- *Vertical* – the hierarchical relationship of the whole to its parts and the parts to a whole
- *Horizontal* – the relationship between versions of an item in different languages, formats, media etc.
- *Chronological* – the relationship in time between issues of an item

The current research of bibliographic relationships in traditional and online environment (Tillet, B., 1987 and Velluci, S.L., 1997) identifies following types of bibliographic relationships:

- ***Equivalence relationships***, which hold between exact copies of the same manifestation of a work, or between an original item and reproduction of it, as long as the intellectual content and authorship are preserved. Included here are copies, issues, facsimiles, photocopies, microforms, and other similar reproductions

- ***Derivative relationships*** (called horizontal relationships in UNIMARC), which hold between a bibliographic item and a modification based on that same item, including variations, versions, editions, revisions, translations, adaptations, paraphrases, etc.
- ***Descriptive Relationships,*** which hold between a bibliographic item or work and a description, criticism, evaluation, or review of that work, including annotated editions, casebooks, commentaries, critiques, etc.
- ***Whole-Part relationships*** (called vertical relationships in UNIMARC or hierarchical relationships by Goossens), which hold between a component part of a bibliographic item or work and its whole, including a selection from an anthology, collection, or series
- ***Accompanying relationships,*** which hold between a bibliographic item and the bibliographic item it accompanies, such that the two items augment each other equally or one item augments the other principle or predominant item, including supplements, concordances, indexes, catalogs, etc.
- ***Sequential relationships*** (called chronological relationships in UNIMARC), which hold between bibliographic items that continue or precede one another, include successive titles in a serial, sequels of a monograph, parts of a series, etc.
- ***Shared Characteristic relationships,*** which hold between a bibliographic item and other bibliographic items that are not otherwise related but coincidentally has a common author, title, subject or other characteristic used as an access point

The FRBR model identified three primary relationships among group I entities (as reflected in *Figure 1*). These are :

- <*realized_through*> relationship connecting *work* and *expression*
- <*embodied_in*> relationship connecting *expression* and *manifestation*
- <*examplified_by*> relationship connecting *manifestation* and *item*

The group II entities of the FRBR model are connected to the group I entities by four relationships types (as in *Figure 2*):

- <*created_by*> that links person/corporate body to *work*
- <*realized_by*> that links person/corporate body to *expression*

- <*produced_by*> that links person/corporate body to *manifestation*
- <*owned_by*> that links person/corporate body to *item*

The entities of all the three groups are connected to the *work* entity by a subject relationship (*see Figure 3*). The <has_as_subject> relationship serves as the basis for identifying the subject of an individual work and ensures that all relevant works to a given subject are linked to that subject. Apart from these primary relationships among entities, the FRBR model proposed a group of other relationships :

- o *Work-to-Work relationships*

  Successor, Supplement, Complement, Summarization, Adaptation, Transformation, Imitation and Whole/Part

- o *Expression-to-Expression relationships*

  Abridgement, Revision, Translation, Arrangement, Successor, Supplement, Complement, Summarization, Adaptation, Transformation, Imitation and Whole/Part

- o *Manifestation-to-Manifestation relationships*

  Reproduction, Alternate and Whole/Part

- o *Item-to-Item relationships*

  Reconfiguration, Reproduction and Whole/Part

- o *Expression-to-Work relationships*

  Successor, Supplement, Complement, Summarization, Adaptation, Transformation, Imitation and Whole/Part

- o *Manifestation-to-Item relationships*

  Reproduction

4. User Tasks and FRBR

User convenience is the highest principle of bibliographic description. Bibliographic description should facilitate the scope of relating the data that are encoded in bibliographic records to the needs of the user of those records. It should ensure a basic level of functionality for records

created by bibliographic agencies and libraries. In this context FRBR model identifies that users of bibliographic records perform four generic tasks at the time of searching and making use of library catalogues, national bibliographies and bibliographic databases. These are :

- Using the data to ***find*** materials that correspond to the user's stated search criteria (e.g., in the context of a search for all documents on a given subject, or a search for a recording issued under a particular title)
- Using the data retrieved to ***identify*** an entity (e.g., to confirm that the document described in a record corresponds to the document sought by the user, or to distinguish between two texts or recordings that have the same title)
- Using the data to ***select*** an entity that is appropriate to the user's needs (e.g., to select a text in a language the user understands, or to choose a version of a computer program that is compatible with the hardware and operating system available to the user)
- Using the data in order to acquire or ***obtain*** access to the entity described (e.g., to place a purchase order for a publication, to submit a request for the loan of a copy of a book in a library's collection, or to access online an electronic document stored on a remote computer).

Bibliographic entity is the object of users' interest and attributes and relationships of entities help users to reach to the entity. Hence, attributes and relationships of bibliographic entities can be mapped directly to the users tasks. But the relative values for each attribute and relationships varied to some degree on the basis of nature and purpose of user task. FRBR model assesses the relevance of each attribute and relationship to the tasks performed by users of bibliographic data and ranked them as High, Moderate and Low. In view of the above list we may relate attributes and relationships of any entity with the four generic user tasks in terms of degree of relevance (high, moderate and low).

As we know, bibliographic records reflect manifestations; the attributes and relationships of manifestation (see annexure I for attributes of manifestation) can be mapped to generic user tasks (Mukhopadhyay, P.S., 2005). This mapping will provide an idea of relative values of various bibliographic data elements against specific user tasks. The high, moderate and low valued attributes of manifestation are identified against four generic tasks and tabulated as below :

Task 1: Find manifestation

Value	Attributes
High	Title of the *manifestation; Manifestation* identifier
Moderate	Series statement; Form of carrier; Numbering (serial)
Low	Statement of responsibility; Date of publication/distribution; Fabricator/ manufacturer

Task 2: Identify manifestation

Value	Attributes
High	Title of the *manifestation;* Statement of responsibility; Edition/issue designation; Date of publication/distribution; Series statement; Form of carrier; *Manifestation* identifier; Foliation (hand-printed book); Collation (hand-printed book); Numbering (serial)
Moderate	Extent of the carrier; Physical medium
Low	Place of publication/distribution; Fabricator/manufacturer; Capture mode; Dimensions of the carrier; Typeface (printed book); Type size (printed book); Colour (image); Reduction ratio (microform); Polarity (microform or visual projection); Presentation format (visual projection); System requirements (electronic resource); File characteristics (electronic resource)

Task 3: Select manifestation

Value	Attributes
High	Statement of responsibility; Edition/issue designation; Date of publication/distribution; Form of carrier; Reduction ratio (microform); Presentation format (visual projection); System requirements (electronic resource)

Moderate	Publisher/distributor; Series statement; Capture mode; *Manifestation* identifier; Access restrictions on the *manifestation;* Polarity (microform or visual projection); Generation (microform or visual projection); Mode of access (remote access electronic resource) Access address (remote access electronic resource)
Low	Title of the *manifestation*; Place of publication/distribution; Fabricator/ manufacturer; Physical medium; Source for acquisition/access authorization; Terms of availability; Typeface (printed book); Type size (printed book); Playing speed (sound recording); Groove width (sound recording); Kind of cutting (sound recording); Tape configuration (sound recording); Kind of sound (sound recording)

Task 4: Obtain manifestation

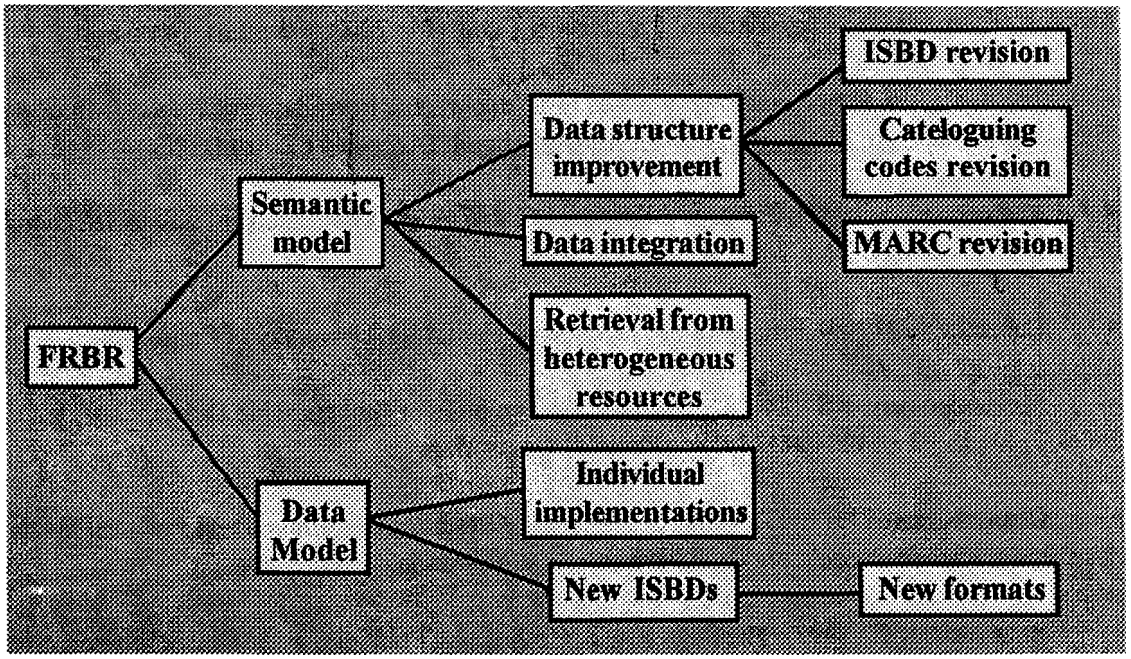
Value	Attributes
High	Title of the *manifestation*; Statement of responsibility; Edition/issue designation; Place of publication/distribution; Publisher/distributor; Date of publication/distribution; Series statement; Form of carrier; *Manifestation* identifier; Foliation (hand-printed book); Collation (hand-printed book); Numbering (serial); Mode of access (remote access electronic resource); Access address (remote access electronic resource)
Moderate	Dimensions of the carrier; Access restrictions on the *manifestation;*
Low	Source for acquisition/access authorization; Terms of availability; Reduction ratio (microform); Polarity (microform or visual projection); Generation (microform or visual projection); Presentation format (visual projection); System requirements (electronic resource); File characteristics (electronic resource)

Similarly the bibliographic relationships related to *manifestation* and user tasks in terms of *manifestation* may be mapped as :

Bibliographic Relationships		User Tasks			
Relationships between:	*Relationship types*	*Find manifestation*	*Identify manifestation*	*Select manifestation*	*Obtain manifestation*
Manifestation And other Manifestations	Reproduction	Moderate	Moderate	Moderate	Moderate
	Alternate	Low	Low	Low	Low
	Component	—	Low	Low	—
	Integral part	—	—	Low	—
Manifestation and Items	Reproduction	Moderate	Moderate	Low	—
Manifestation and Persons / Corporate bodies	Production / Dissemination	Moderate	—	—	—

5 Future Applications of FRBR

IFLA's epoch-making model of bibliographic description, known as FRBR, has influenced greatly the formulation of new set of principles by Joint Steering Committee for Revision of AACR. The future applications of FRBR as a semantic model as well as a data model may be predicted as below :



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Annexure I

	Entities (Group I)			
	Work	**Expression**	**Manifestation**	**Item**
ATTRIBUTES	Title of the *work* Form of *work* Date of the *work* Other distinguishing characteristic Intended termination Intended audience Context for the *work* Medium of performance (musical work) Numeric designation (musical work) Key (musical work) Coordinates (cartographic work) Equinox (cartographic work) *(Concluded)*	Title of the *expression* Form of *expression* Date of *expression* Language of *expression* Other distinguishing characteristic Extensibility of *expression* Revisability of *expression* Extent of the *expression* Summarization of content Context for the *expression* Critical response to the *expression* Use restrictions on the *expression* Sequencing pattern (serial) Expected regularity of issue (serial) Expected frequency of issue (serial) Type of score (musical notation) Medium of performance (musical notation or recorded sound) Scale (cartographic image/object) Projection (cartographic image/object) Presentation technique (cartographic image/object) Representation of relief (cartographic image/object) Geodetic, grid, and vertical measurement (cartographic image/object) Recording technique (remote sensing image) *.....continued*	Title of the *manifestation* Statement of responsibility Edition/issue designation Place of publication/ distribution Publisher/distributor Date of publication/ distribution Fabricator/manufacturer Series statement Form of carrier Extent of the carrier Physical medium Capture mode Dimensions of the carrier *Manifestation* identifier Source for acquisition/access authorization Terms of availability Access restrictions on the *manifestation* Typeface (printed book) Type size (printed book) Foliation (hand-printed book) Collation (hand-printed book) Publication status (serial) Numbering (serial) Playing speed (sound recording) Groove width (sound recording) Kind of cutting (sound recording) Tape configuration (sound recording) Kind of sound (sound recording) Special reproduction characteristic (sound recording) Colour (image) Reduction ratio (microform) *.....continued*	*Item* identifier Fingerprint Provenance of the *item* Marks/inscriptions Exhibition history Condition of the *item* Treatment history Scheduled treatment Access restrictions on the *item* *(Concluded)*

	Entities (Group I)			
	Work	**Expression**	**Manifestation**	**Item**
ATTRIBUTES		Special characteristic (remote sensing image) Technique (graphic or projected image) *(Concluded)*	Polarity (microform or visual projection) Generation (microform or visual projection) Presentation format (visual projection) System requirements (electronic resource) File characteristics (electronic resource) Mode of access (remote access electronic resource) Access address (remote access electronic resource) *(Concluded)*	

	Entities (Group II)	
	Person	**Corporate Body**
ATTRIBUTES	Name of *person* Dates of *person* Title of *person* Other designation associated with the *person*	Name of the *corporate body* Number associated with the *corporate body* Place associated with the *corporate body* Date associated with the *corporate body* Other designation associated with the *corporate body*

	Entities (Group III)			
	Concept	Object	Event	Place
ATTRIBUTES	Term for the concept	Term for the object	Term for the event	Term for the place