

DEVELOPMENT IN THE UNIVERSE OF SUBJECTS, CHANGES  
IN SYSTEMS FOR DOCUMENT FINDING, AND USERS' PROBLEMS:  
INDIA'S CONTRIBUTION TO A SOLUTION.

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ABSTRACT

*The foundation of efficient service from a System for Document Finding (SDF), satisfying the Laws of Library Science, is an efficient system for the classification of subjects. The efficiency of classification may be adversely affected by the complexity of the subjects thrown forth at an increasingly rapid rate. To meet this impact effectively, the classification system should be capable of change, evolution, and hospitable to the developments in the universe of subjects. Thus, while change is inevitable, a mechanism built into the SDF is necessary to mitigate the inconvenience to users caused by frequent changes. The Freely-facetted classification system developed in India can provide this mechanism. The General Theory of Classification on which the system is based, bypasses the phenomenal level and postulates, at the near-seminal level, about the mode of combination of the relatively stable ultimate ideas to form subjects. The Absolute Syntax of Ideas, for example, is comparatively more stable, consistent over a period of time among different people, and is independent of mother-tongue. Therefore, a structuring of subjects, conforming to this syntax is less affected by the changes in the phenomenal level. Further, the structure being in conformity with the normal mode of thinking of intellectuals will be helpful to a majority of specialist readers. Ranganathan's General Theory of Classification built upon such fundamental guiding principles is helpful in designing a SDF capable of meeting comfortably the developments in the universe of subjects and cushioning off their impact to an appreciable extent. The organisation for continuous updating of classification in libraries is also considered.*

0 USER

The main categories of users of a System for Document Finding (=SDF) are

1 Reader ; and

## 2 *Library staff.*

The design of a SDF should be such as to help the reader in selecting documents on the subject of his interest at the moment, to the satisfaction of the Five Laws of Library Science (6). The role of the library staff is essentially to help the reader in this selection of documents by providing adequate tools and services and guiding the reader in their use. By implication, the library tools should be kept sharpened to maintain the efficiency of library service at a high level.

### 1 SUBJECT APPROACH

A reader may select documents by such elements as name of author, collaborator, series, subject etc. Experience shows that subject approach is the majority approach, especially among specialist readers. Therefore, to satisfy the Laws of Library Science and the Law of Parsimony, it will be helpful to arrange by subjects :—

- 1 The Main Entries in the catalogue or documentation list ; and if practicable,
- 2 The documents themselves on the shelves unless their size or their being part of a host document prevents them from being arranged on the shelves.

Thus, the attributes of the system of classification of subjects used will determine the efficiency of the SDF to a large extent. For the SDF to give efficient service—that is, pinpointed, exhaustive, and expeditious service at optimum cost—the classification system used should, in general, be able to give

- 1 A coextensive representation of each of the subjects of the documents included in the SDF and considered to be of potential interest to the users of the system ;
- 2 A helpful arrangement of the subjects to the satisfaction of a majority of the readers ; and
- 3 The facility mentioned in categories 1 and 2 not only in the present context of the universe of subjects, but also in the context of the likely developments in it in the future, as implied by Law 5 of Library Science.

### 2 COEXTENSIVE REPRESENTATION OF SUBJECT

A Subject is a systematised body of ideas (12). It may consist of one idea or a combination of several ideas. The latter is the case with a majority of the subjects sought by specialist readers. A coextensive representation of a subject requires as a prerequisite

- 1 Recognising each of the component ideas in the subject ; and
  - 2 Determining the degree of interrelation among the components.
- For, two subjects may differ from each other in respect of

- 1 The component ideas ; and
- 2 The interrelation among the component ideas even if the latter are the same in the two subjects.

A current model of a scheme for classification based on this idea of subject structure representation is the Freely-faceted Analytico-Synthetic Classification (7).

### 3 DOCUMENT-SEARCH AND SELECTION

The selection of documents from the SDF in response to an expressed or anticipated query of reader about a subject usually consists of the following steps :

- 1 Analysis of the subject of the query to determine the component ideas ;
- 2 Determining the correct degree of interrelation between the component ideas recognised in Step 1 ;
- 3 Arranging the component ideas in a sequence coextensively representing the subject of the query ;
- 4 Matching the analysed and synthesised subject of the query with the subject of the documents included in the SDF, which stand already analysed and synthesised in a similar manner ; and
- 5 Selection of the documents whose subjects match with the subject of the query to a predetermined degree.

It is obvious then that the efficiency of document search and selection will be influenced by the efficiency of the analysis of the subject of the query into its components, and their synthesis—that is, recognition of the component ideas and the interrelation among them.

#### 31 *Psychology of Research in Depth*

A specialist is usually concerned with subjects of great intension containing a number of components with intricate interrelation among them ; subjects which are often in the wavefront of thought in his field of specialisation or even in some other field. Further, psychology of research makes him deeply immersed in some minute problem or other in the field. These factors make it difficult for the specialist to remember all the component ideas of his subject of interest at the moment of his

using the SDF. Again, human memory is not acquiring increased capacity to recall a larger and larger number of entities at a time. Therefore, even if a SDF is based on a good scheme for classification, the efficiency of its service will be adversely affected if the analysis of the subject of the reader's query is inadequate and not exhaustive.

#### 4 PROBLEMS IN SUBJECT REPRESENTATION

##### 41 *Social Pressure and Development of Universe of Subjects.*

A Dynamic development of the universe of subjects is inevitable. It is a consequence of the growing demands of society—both in variety and in quantity. One form of the social pressure experienced over vast areas of the world is population pressure. It has led to inadequacies and imbalances in the availability of even the basic necessities of life—food, clothing, shelter, transport, and communication. Therefore, "higher production" and "greater productivity" are emphasised in all human effort. Technological transformation of unconsumable raw materials into consumable commodities has become a necessity. A change in the method of organization of human resources has become necessary. Thus, solo-research is being largely replaced by team-research, and parallel-research is being replaced by relay-research (3). A variety and range of knowledge, expertise and skill are brought to bear on each problem. This interdisciplinary team input has brought about accelerated and spectacular output. Therefore, we may conjecture that this method of management of human resources will be used in an increasing measure. This has a variety of impact on the universe of subjects. A few examples are mentioned in the succeeding sections.

##### 42 *New modes of Formation of Subject*

For example, until about 1967, only four modes of formation of subjects—namely, Loose assemblage, Lamination, Denudation, and Dissection—were recognised (13). But, during the last three years, three more modes of formation—namely, Fusion, Distillation, and Subject-Bundle—have been isolated (5).

##### 43 *New Subjects*

Again, the number and variety of subjects in the universe of subjects is increasing at a fast rate. This implies the emergence of new subjects, new Main subjects, new Basic subjects going with one or other of the Main subjects, and new isolate ideas. These are emerging at a faster rate than ever before. This makes the universe of subjects tend to infinity. Gaps in our knowledge are getting filled up.

#### 44 *Attributes affecting SDF*

These and other attributes of the universe of subjects affecting the design of a SDF in general, and the structuring and representation of subjects—that is, classification—in particular, have been receiving increasing attention from librarians and subject specialists in recent years. The attributes of the universe of subjects of particular concern to the designer of a SDF include the following ( 2 ).

- 1 Its manifold multi-dimensional quality ;
- 2 The different modes of formation of subjects ;
- 3 The variation in the strength of bond among the component facets ;
- 4 The interrelation among the subjects ;
- 5 The tendency of the universe of subjects to become turbulently dynamic ;
- 6 Its tendency to become infinite
- 7 Its tendency to become a continuum ;
- 8 The variation in the frequency of incidence of the different modes of formation of subjects at different stages of its development ;
- 9 The variation in the frequency and pattern of incidence of different kinds of facets making up a subject ; and
- 10 The variation in the impact of the different kinds of ideas,—that of the intuition-based seminal or near-seminal, and of the purely intellect-based phenomenal.

#### 45 *Wide Range of Parameters*

It is obvious then that there is a wide range of parameters of the universe of subjects that affect the design of SDF. Further, the value of each of the parameters may vary over a wide range.

#### 46 *Dilemma*

The Laws of Library Science direct that the SDF should conveniently accommodate the developments in the universe of subjects, so as to ensure pinpointed, exhaustive, and expeditious service to a majority of readers. This implies development and evolution of the SDF to keep up with the dynamism of the universe of subjects. If frequent, these changes themselves can be a cause of inconvenience to the users of the SDF, particularly the readers. Neglecting either side of the question will be doing violence to the Laws of Library Science. This is the dilemma. Thus, the question is how to reconcile the changes in the SDF to keep

step with the universe of subjects on the one hand, and the possible inconvenience to users caused by the changes, on the other.

## 5/6 INDIA'S CONTRIBUTION TO A SOLUTION

### 5 METHOD OF APPROACH

#### 51 *Help to Reader*

As mentioned in Sec 3, the great specificity of the subject and concentration at depth characterise the work of the research worker. It is usually difficult for him to remember all the component ideas forming the specific subject of great intension, of interest to him at the moment. But, unless the reader's subject interest is specified adequately, the documents selected to meet his needs will not be pinpointed, and exhaustive. There will be noise and leakage. Therefore, the design of the SDF should be such that it has a built-in mechanism to help the reader *recall* as many of the component facets as possible, of his specific subject of interest at the moment.

#### 511 *Browsing and Cue*

The mechanism to help the recall of the facets by the reader may take the form of providing cues to him by the pattern of display of the subjects. It should be possible to land the reader in that region of the catalogue or documentation list, wherein in subjects in the umbral and the penumbral regions of his interest are displayed together. As he browses through the classified arrangement or entries—each entry consisting of Class Number, Feature Heading, and bibliographical specification of the document—he is enabled to recall the different components of the subject of interest to him at the moment by a process similar to the recall of ideas by association ( 1 ). Further, the display would enable him to be aware, as he browses, whether he is getting nearer to the subject of his interest or whether he is moving away from it. Such a display of subjects gives an Apupa ( Alien-Penumbral-Umbral-Penumbral-Alien ) pattern ( 14 ). A freely-faceted classification helps in providing such a helpful pattern of the display of subjects.

#### 52 *Work at Near-Seminal Level*

Classification is the transformation and mapping of the multi-dimensional universe of subjects on a line. At the phenomenal level, the occurrence of a large number of component facets in a subject confuses the picture and makes the recognition of the appropriate interrelation between them in a subject and between compound subjects difficult. In

this situation it becomes difficult to determine the degree of immediate-Neighbourhood Relation among the component facets of a subject (8). But this is necessary. An approach found helpful is to bypass the phenomenal level and dive deep to the near-seminal level, where a few seminal ideas and their interrelation can be recognised. The methodology for the design of schemes for classification can be more securely based on these stable foundations.

### 53 *Guided Development*

In order to meet the impact of the different attributes of the universe of subjects mentioned in Sec 4, the model and the methodology for the design of schemes for classification should be such that the scheme can conveniently accommodate the developments in the universe of subjects without its basic structure being affected to any appreciable extent. The freely-faceted analytico-synthetic scheme for classification developed in India has this capacity to a much greater degree than other models. To continue to keep up with the changes in the universe of subjects in this way, the scheme should have a built-in capacity for self-perpetuation. One method of achieving this is to provide a set of explicitly stated normative principles to guide the development of the scheme and also the methodology for the design of schemes for classification. At present, the Colon Classification is the only scheme satisfying all these conditions. It is desirable that other similar schemes are designed. Then a comparative study will become possible. It is only by a comparative study the merits and demerits of the different schemes can be understood, and each of the schemes can be improved.

## 6 BASIS FOR DESIGNING A SYSTEM FOR DOCUMENT FINDING

### 61 *Fundamental Categories*

Work in the near-seminal level disclosed the possibility of reducing the numerous component ideas presented in the universe of subjects, to five types. The result is the Postulate of Fundamental Categories (15). This master postulate was followed by the Postulate of concreteness (16).

### 62 *Round and Level*

Classification of subjects of great intension disclosed the possibility of the occurrence of same fundamental category more than once. This led to the Postulate of Rounds (9) and Postulate of Levels (10).

### 63 *Absolute Syntax*

The sequence in which the component facets in a subject arrange themselves in the minds of the majority of readers may be called Absolute

Syntax of Facets (18). Unlike the Linguistic Syntax, the Absolute Syntax is more stable and consistent over a period of time, even among people with different educational and social backgrounds, and it is independent of language.

#### 64 Facet Syntax

A sequence of the kernel terms denoting the facets of a compound subject giving satisfaction to the intellect of the majority made parallel to the Absolute Syntax—that is, each subject is expressed in a structure conforming to the Absolute Syntax of Facets,—is not likely to be affected to any appreciable extent by the changes in the phenomenal level of isolates in the universe of subjects. The Wall-Picture Principle and its corollaries (11), give a Facet Syntax (17) similar to the Absolute Syntax. It also gives a helpful sequence among the isolates within a schedule.

#### 7 SUM UP

Ranganathan's General Theory of Classification with its 11 Normative Principles, 13 Postulates, 43 Canons, and 22 Principles, is helpful in designing and developing a self-perpetuating SDF capable of conveniently accommodating the developments in the universe of subjects. It can accept new facets demanding interpolation in the facet structure. It can also sharpen any isolate in any facet, quite independently, without disturbing the other isolates and facets.

The facet syntax, based on the appropriate normative principles, being similar to the Absolute Syntax is found comfortable by the majority of readers because of the similarity of structuring of subjects in the SDF and that in their own mind. Therefore, once such a pattern for the structuring of a subject is recognised for use in the design of a SDF, any change in the phenomenal level of isolates such as the addition of new isolates and even the addition of new subjects in the SDF, is not likely to inconvenience the reader's thinking and approach to document search to any appreciable extent. Thus, this General Theory of Classification can handle not only the past and present state of the universe of subjects, but also the likely developments in it in the near future. Consequently the SDF based on it is in a better position to cushion off, to a considerable extent, the impact of the rapid developments in the universe of subjects. The theory can be used as the basis in the design of any SDF in general. Further, it holds good so long as more helpful results are not available, from controlled testing of alternative set of postulates.



## 8 MANAGEMENT OF CLASSIFICATION

### 81 *Updating of Classification*

In the context of the increasing turbulence of the universe of subjects two other aspects of the SDF, particularly of the classification used in it, require attention. These aspects are :

- 1 Maintaining the scheme for classification continuously updated ; and
- 2 Implementation of the changes in the schemes for classification in the libraries using the scheme.

### 82 *Current Practice*

In general, at present, the organisation for this updating at two levels takes the form of publishing a new edition of the scheme for classification once in five to ten years, depending upon the quantum of changes to be incorporated and the facility available for bringing out the new edition. During the interval, the new findings applicable to Colon Classification are generally published in the quarterly *Library science with a slant to documentation*, and the volume of Proceedings of the Annual DRTC Seminars. This is done for two purposes :—

- 1 To elicit evaluation and opinion from classificationists and classifiers ; and
- 2 To give notice to the classifiers using the scheme, of what is being done.

The Research Cell in DRTC is continuously watching the new demands of the universe of subjects and working out the changes, if any, needed in Colon Classification.

### 83 *Need for Change of Frequency of Updating a Scheme for Classification*

Today, the rate of production of new subjects and of those requiring representation by additional facets is appreciably greater than what it was, say, two decades ago. This rate, already a high figure, is likely to increase further in the future. The method of Osmosis is of help in meeting this situation. But, it has been found that if Colon Classification is used, the change of compound subjects from one basic subject to another is negligibly small. During the last forty years need had arisen only to change the Indicator Digits in some cases. Generally speaking, Class Numbers with the old Indicator Digits and with the new Indicator Digits are interfiled without much difficulty until all the old Indicator Digits are changed.

#### 84 *Principle of Osmosis*

The libraries using particular scheme are expected to carry out the corrections, additions, etc when the new edition is brought out. The Principle of Osmosis (4) is a helpful guide in implementing the changes and corrections in classification, at minimum cost. The inconvenience caused to readers in implementing the changes is also reduced to a tolerable limit.

#### 85 *Obsolescent Material*

It is generally found that most books get outmoded in thought in about one generation. Such books should be weeded out systematically in every service library. Any book not getting outmoded within a generation would have been in constant use. Hence, the library copy would have been worn out and it must be weeded out. It must be replaced by a new copy, preferably a new edition. Further, many books go out of use within about five or six years. The other books can be reclassified by the method of Osmosis in about six months, and put in a new sequence and its corrected catalogue cards too should be placed in a new sequence. Thereafter, there will generally be two sequences in a library—the old and the new. Some book or other of the old sequence, which has been brought into use by some reader or other, should be reclassified. The book itself and its corrected catalogue cards should be transferred to the new sequence. Such a transfer under the "Osmotic Pressure of use" will go on diminishing in number.

The old habit of clinging for ever to all books brought into the library at sometime or other should be given up in a service library. The Dormitory Library of a Nation or of a Constituent State, as the case may be should become the custodian of at least one sound copy of all the obsolete, cent books weeded out by the many service libraries. The Dormitory Library should make copies of such obsolescent books available to bibliographers—particularly historical bibliographers—bibliophiles, and hystriographers of the subjects concerned. The call for these purposes will normally be few and far between. The books may be sent to them through the local library. Even if this be not allowed, it is cheaper to pay the expense of such occasional users to come to the dormitory library than to spend money on addition to the stack rooms of the many thousands of the service libraries—which will become necessary if the obsolescent books are not weeded out. This is being stressed by S. R. Ranganathan for the last thirty years. He was led to it when his advice was sought by several library authorities for the extension of library buildings, which required a considerable sum of money.

86 *Management of a Scheme for Classification*

The process of updating a scheme for classification has to be almost continuous to keep up with the developments in the universe of subjects. For this purpose, the cell for Developmental Research in Classification and for updating a scheme for classification should have access to a large proportion of the current documents in various subjects. Further, it should have facility of consulting specialists in the different subjects, particularly those working in the wavefront of knowledge. A list of the changes should be made available to the users of the scheme at short intervals. Such a plan of organisation for the Management of Classification can help in the changes and corrections in classification being merged into and spread over almost as a part of the routine of classifying in libraries. That is, the burden of accumulated documents is likely to be felt to a comparatively much less extent. Further, the library tools will be kept up to date and the services to readers will be maintained at a level of high efficiency despite the rapid developments in the universe of subjects.

## 91 BIBLIOGRAPHICAL REFERENCES

- 1 Sec 511 HANNA ( J F ). New approach to the formulation and testing of learning models ( Synthese. 16, 1966 ; 347 )
- 2 Sec 44 NĒELAMEGHAN ( A ). Integrated approach of India to the design and development of document retrieval systems ( In Mikhailov ( A I ) and others, International forum on informatics. 1969 ; V 2 ; P 120 to 121 ).
- 3 Sec 41 RANGANATHAN ( S R ). Areas for research in library science. ( Lib sc. 4 ; 1967 ; Paper P ).
- 4 Sec 84 —. Classified catalogue code. Ed 5. 1964. Chap CG.
- 5 Sec 42 —. Colon classification, Edition 7 ( 1971 ) : A preview. ( Lib sc. 6 ; 1969 ; Sec MO 53 ).
- 6 Sec 0 —. Five laws of library science 1931. Ed 2 1957.
- 7 Sec 2 —. Prolegomena to library classification. Ed 3. 1967. Chap CY.
- 8 Sec 52 —.—. Chap QC
- 9 Sec 62 —.—. Chap RH
- 10 Sec 62 —.—. Chap RJ
- 11 Sec 64 —.—. Chap RM and RN
- 12 Sec 2 —.—. Sec CR3
- 13 Sec 42 —.—. Sec PA4 ot PE
- 14 Sec 511 —.—. Sec QB7
- 15 Sec 61 —.—. Sec RB1
- 16 Sec 61 —.—. Sec RK2
- 17 Sec 64 —.—. Sec XJ1
- 18 Sec 63 —.—. Sec XJ3