INTRODUCTION
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The universe of recorded information has expanded at such a rate that the phenomena is known as information explosion. Estimates suggest that there are now about 80,000 regular scientific journals in existence. The annual output of books comes to about 300,000 titles of which 90,000 are in English language. This information explosion poses problems for library and information workers. The basic problem is how to make this magnitude of documentary information available to those who need it. Availability means to remove barriers in the dissemination and transfer of information and to provide right information to the right user in the right way at the right time.

Developments in the tools and techniques from conventional to computerised systems bear a clear testimony to the efforts being made to cope up with the problem. In the beginning, the concentration was only on techniques and tools. But gradually and especially after the second world war, it began to be realised that techniques and tools would not go far without a sound theory. This realisation led library scientists to go to the heart of the problem of information retrieval. Soon it was clear that without developing a theory of the
structure and development of the universe of subjects, real progress was far away. Bliss and Ranganathan stand prominent in this respect.

A subject is an organised or systematised body of ideas, whose extension and intension are determined by the field of interest, intellectual competence and field of inevitable specialisation of a normal person. Knowledge is the totality of ideas conserved by human civilisation. The constituents of subject and knowledge are the same i.e. ideas. An idea is generated when a knower knows an entity that is, knowee. Thus there are three correlated universes - universe of entities or knowees, universe of ideas and knowledge and universe of subjects. The universe of entities or knowees consists of all known entities and of all knowable entities. The universe of ideas consist of ideas preserved by human civilisation at a particular point of time. The universe of ideas is equivalent to the universe of knowledge. For each idea in the universe of ideas, there is an entity correlate in the universe of entities. Further the totality of all the sets of systematised body of ideas - that is, subjects- constitute the universe of subjects. For each subject in the universe of subjects, there is a set of idea correlates in the universe of ideas.
Thus entity, idea, knowledge and subject are correlated terms and concepts. The thesis, therefore, begins with an enquiry into the nature, formation and sources of knowledge. Knowledge is of two types 'personal knowledge' and 'social knowledge'. Social knowledge is the knowledge possessed collectively by a society or social group. It is available freely and equally to all the members of that society through its records. As librarians our main concern is with social knowledge. The characteristics of social knowledge resemble the concept of "World Three" as given by Karl Popper. "World Three" of Popper is the world of knowledge or information in the objective sense. It comprises the expressions of scientific, literary and artistic thoughts codified in libraries and museums, together with all the records of human culture.

Social knowledge is of different kinds. The best way to distinguish between different kinds of social knowledge is by referring to the concept of 'subject'. Applying the concept of subject, we can distinguish three kinds of subject i.e. Basic Subject, Compound subject and Complex Subject.

The concept of subject is basic to library and information services. A study and understanding of the attributes of 'subject' and 'Universe of Subjects' is pre-requisite to the proper design of any system for information retrieval. The attributes of 'subject' and of the universe of subjects usually
considered relevant in such a study are:

(1) Development of the universe of subjects; and
(2) Structure of subject.

Development refers to the pattern of development of the universe of subjects and the subjects constituting it. Structure implies network of relationships among the elements or units constituting subjects and the universe of subjects. Developmental studies lead to the recognition of structures at different stages in the growth. Structural studies provide an insight into the patterns of relationship and ultimately help in finding out the modes of formation of subjects. Theories of structuralism and system analysis have contributed a lot in understanding the structural attributes of the universe of subjects.

The concept of modes of formation of subjects is actually a search for the pattern of relationship among the ideas forming constituents of subjects. Ideas combine in subject statements in numerous ways. There is need to recognise certain patterns at the seminal level. Ranganathan could do it by diving deeper at the near-seminal level and reduced the number of combination of ideas to a few patterns. In other words modes of formation of subjects represent a typology of relations among ideas constituting subjects.
Ranganathan started search for a conceptual model of typology of relations around mid 1940s. He was able to identify three modes in 1940's as: Denudation, Lamination and Loose Assemblage. Two more modes—Dissection and Superimposition—were added between 1940s and 1967. By the time Ranganathan started work on the seventh edition of the Colon Classification, he had been able to recognise twelve modes of formation of subjects.

The recognition of modes of formation of subjects leads to the knowledge of the association among the constituents of the universe of subjects. It also helps to grasp the essence of the bond among the constituents. Once the bond among the constituents of subjects is known, an efficient information retrieval system can be designed to the satisfaction of its users.

Objectives:

The study presented in this thesis, therefore, aims at exploring the following:

(i) Concept of a subject and its developmental and structural aspects;

(ii) Universe of Subjects in developmental perspective: a general survey of major developments in the Universe of Subjects.
(iii) Universe of subjects in structural treatment: concept of structure and subject as system.

(iv) Structural studies in the field of Library and Information Science.

(v) Detailed study of the Modes of Formation of Subjects as enunciated by S.R. Ranganathan.

(vi) Empirical testing of the Modes of Formation.

(vii) Role of the Modes of Formation in information retrieval.

Methodology:

Objectives make it clear that there are two aspects of the treatment contained in the study. The first aspect relates to conceptual foundations relying on documentary sources from a wide spectrum of subject fields including Library and Information Science. The second aspect is empirical testing of the Modes of Formation. The methodology evolved for empirical testing is as follows:

(i) To scan the Annual Volumes of the British National Bibliography for Sociology and Biology for two years i.e. 1974 and 1984;

(ii) To list the main entries in separate slips;
(iii) To identify the specific subject of each main entry by the title of the document as well as by the subject headings associated with the entry:

(iv) To analyse each specific subject in context of its Mode of Formation;

(v) To determine the quantitative scatter of Modes of Formation.

Conspectus:

The first chapter seeks to define knowledge by analysing concepts and ideas leading to the formation of knowledge and ultimately to subject formation. The views of three famous philosophers: John Locke, George Berkely and David Hume have been discussed. The role of psychological processes in the formation of knowledge has been highlighted with special reference to the Brain Chamber schematic representation as given by S.R. Ranganathan. The next question considered is: by what means we gain knowledge?

The ideas exposed in the first chapter have been carried forward in the second chapter to define a subject and describe the characteristics of the Universe of Subjects. Further, it has been pointed out that there is close relationship between
the structural aspects and the developmental aspects of a Subject/Universe of Subjects. It has been also highlighted that structural studies are not possible without a developmental perspective.

The reasoning of the second chapter has led to cover developmental perspective in the third chapter. An attempt has been made in this chapter to trace major developments in the field of Natural sciences, Social Sciences and Humanities and derive certain generalisations about growth pattern.

Developmental studies of the Universe of Subjects impose certain basic questions about the structure of a Subject/Universe of Subjects in the fourth chapter. The chapter starts with the conceptual framework of structure, analyses the theory of structuralism and shows its application in a few disciplines like linguistics, anthropology and mathematics. The chapter also identifies certain structures at various stages in the growth of the Universe of Subjects.

Structural treatment gives rise to the concept of subject as system. The application of some of the principal notions of General System Theory has been shown in the fifth chapter to derive structural characteristics.
The sixth chapter is a discussion of the various studies on subject structuring. Particular attention has been given to the contributions by S.R. Ranganathan, Classification Research Group and major contributions from other countries. The discussion also touches upon certain convergences which can be established between studies in the field of Library Science and other fields like Data Base Organisation, Linguistics, Artificial Intelligence and Cognitive Psychology.

The seventh chapter presents a historical and descriptive account of the Modes. Effort has been made to show the application of these Modes of Main subjects, Compound subjects, Complex subjects and subjects of inter-disciplinary nature.

Empirical testing has been conducted in the eight chapter to confirm:

(a) Whether the formation of subjects can be analysed and accommodated in the context of the Modes enunciated by Ranganathan; and

(b) to ascertain the quantitative measure of their incidence.

The ninth chapter shows the role of the Modes of Formation in information retrieval. It has been tried to show that a
subject indexing language is designed to express meaningful relations among the ideas constituting a subject. The conceptual base of structural relations, inherent in an indexing language, lies in canons, postulates and principles of classification. Further the source of all canons, postulates and principles is traceable in the Modes of Formation.

The tenth chapter forms the conclusion of the study.