

POSTULATIONAL APPROACH TO ANALYTICO-SYNTHETIC CLASSIFICATION

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Presents the postulational framework of S R Ranganathan. Illustrate these postulates with examples of analysis of compound subjects in the field of agriculture. Correlates these postulates to the Absolute Syntax of S R Ranganathan.

A INTRODUCTION

11 *Activity Classification*

Efficiency in organisation and working system of all human activities essentially depends on the art and science of "classifying". Ranganathan said it this way: "Sharpness in thinking, clarity in expression, expedition in response, and exactness in service depends ultimately on good classification". What then is "Classification?" classification is nothing but the process of analysing, arranging, and communicating. Every-one of us do "Classification" every day. We classify our day's activity. We have domestic chores, and official chores. We have working hours and relaxation hours and so on. We organise our dresses—daily wears, official wears, casual wears, etc. We organise our beverages—soft drinks and hard drinks, stimulants and non-stimulants and so on. We distinguish our acquaintances—family members, relatives, friends and even enemies. If you begin to look at this way you would all the time be doing "classification" as it were. It is so common and it is so pervasive! So classification is a familiar process

12 *Knowledge Classification*

We find our thoughts move from "activity" to "knowledge". We begin to look at dividing the latter into compartments—"pigeon holes" as some call it. Knowledge is a super-structure of activities, ideas, and entities. Knowledge classification essentially means classi-

fication of "subjects". What then is a "subject". "Environmental Physiology of desert organisms" is a subject. One of the most proliferate mechanisms through which information about subjects is disseminated is through published documents—such as books, periodical publications, technical reports. Since there are a large number of subjects and there are a large number of documents in each of these subjects, we begin to feel the need for a classification of documents, we begin to build a collection of documents.

13 Library Classification

A library or an information centre, essentially builds a large collection of sources of information of which documents form the primary components. We need to have classification for organising the collection. Thus, the "classification of documents in a library or an information centre" is known as library classification. Since most distinguishing feature of a document is its subject content and since in majority of the cases the approach for documents is through subject content of the document and also that majority users of a library prefer to browse through open shelves of documents in the library, the library classification is designed with the "Subject of the document" as the most preferred characteristic of the book. Therefore, all the schemes for library classification, classify "Subjects" of books.

14 Classification for Information Storage and Retrieval

Classification systems play an important role in information storage and retrieval systems. They act as basic source for generation of controlled vocabularies and search languages. For this purpose, the classification systems may have to design depth schedules.

2 Definition

Thus "Classification" in general, involves three processes:

1. Division and grouping;
2. Arranging the members of the group and the groups themselves in a helpful sequence; and
3. Representing the ranked members of a group by a suitable notational symbol.

Thus, a standard procedure for classifying needs a scheme for classification, which acts as authority list. The Dewey Decimal Classification (Devised in 1876; ed. 18, 1972). Universal Decimal Classi-

ation (Devised 1896; ab ed 3 1961) and Colon Classification (Devised 1933, ed 6 1963) are examples of general schemes for classification meant for arrangement of documents on the shelves of an open access library.

3 Constraints of the Scheme for Classification

Schemes for classification for documents have the problem of being continually kept up-to-date. This is because knowledge is growing at a faster pace and knowledge dissemination in the form of published documents is growing in a much faster pace. De Solla Price has said that total quantum of knowledge doubles every ten years. Thus, in order to give a stable structure for the schemes for classification we must endow them with a capacity to meet the situations posed by the growth of knowledge continually.

Some of the attributes of the universe of subject which affect the design and development of a classification system could be stated as follows:

- (a) Recognition of organised body of ideas — that is, subject — that form fields of specialisation of normal intellectuals;
- (b) Recognition of the types of component ideas of subject;
- (c) Recognition of modes of combination and nature of relationship among the component ideas in different subjects;
- (d) Recognition of the degree of relationship (bond strength) among the fields of specialisation;
- (e) Studying the modes of development of a subject; and
- (f) Setting up a generalised model for structuring of these subjects.

4 Theory of Structure of Subjects and Representation of these Structured Subjects

To keep a scheme for classification in a state of dynamic equilibrium needs a set of guiding principles at different levels of operation. Thanks to the efforts of E C Richardson, W C Berwick Sayers, H E Bliss, and S R Ranganathan and due to team research of many Classification Research Groups we have been able to build a theory of library classification which is resilient enough to meet situations posed by the growth of knowledge from time to time. This theory essentially centres round the process of Facet Analysis of Subjects.

B FACET ANALYSIS**1 Postulational approach**

Facet analysis is the process of analysing the specific subject embodied in a document into its component ideas—called “facets”. These facets are synthesised or recombined in a convenient sequence to arrive at a helpful ranking of the subject in an arrangement of an ensemble of subjects. This process of facet analysis is guided by a set of postulates. These postulates provide an algorithm to facet analysis. There are several alternative sets of postulates which lead to several alternative models of classification. I shall discuss with you the set of postulates enunciated by S R Ranganathan, as it is a comprehensive set.

2 The postulates

The first postulate is:

Every subject has a Basic Subject

A Basic Subject usually refers to a discipline or sub-discipline. A Basic Subject is assumed to emerge due to specialisation and what is known as “atomisation of knowledge”. It encompasses a body of knowledge which is succinctly governed by a set of fundamental laws, hypothesis, postulates and principles. Chemistry, Biochemistry, Biology, Zoology, and Medicine are examples of Basic Subject.

21 Identification of the Basic Subject

To identify the Basic Subject of a subject, general knowledge of the schedules is necessary. Most of the schedules for classification give a roughly similar schedules of them. The indication, by the title of a document, of the Basic Facet of its subject may be either.

1. Explicit, or 2. Implicit

SN	Indication	Title	Basic Facet
1	Explicit	Treatise on coal mining Agricultural diseases Textbook of Indian History	Mining Agriculture History
2	Implicit	Structure of protein Care of cows Income tax	Chemistry Animal Husbandry Economics

The Second postulate is :

There are five and only five fundamental categories—namely, Time, Space, Energy, Matter, and Personality.

These terms and ideas denoted by them belong strictly to the context of classification discipline. They have nothing to do with their use in Metaphysics or Physics. In our context, their significance can be seen only in the statements about the facets of a subject—their separation and sequence. This set of fundamental category is for-brevity, denoted by the initiumym PMEST.

The category "Time" denotes concepts such as Millenium, Century, Decade, Year and so on. Time concept also covers concepts such as day, night, seasons, such as summer, winter, meteorological time such as wet, dry, and stormy.

The category "Space" denotes concepts such as Geographical Space—continents, countries, and districts.

Water formations such as oceans and seas.

Physiological formations such as Deset, Prairie, Rain-forest, Plateau, Mountain, River, and Lake.

Population cluster such as a city, town and village.

The category "Energy" generally covers "action" of entities-inanimate, animate, conceptual, intellectual, and intuitive. Concepts such as Removing, Separating, Determining, Investigating, Experimenting, Testing, Evaluation, Diagnosis, Treatment, Speaking.

The category "Property" generally connotes concepts such as "Function", Accuracy, Reliability, Pattern, Reciprocity, Weight, Density, Fatigue, Conductivity, Isomerism, Harmony, Authority, Legality.

The category "Personality" denotes a concept which is the central theme of the subject.

The following is a list of concepts which may be deemed to be the manifestation of the Category "Personality".

Biological Sciences

1. In the Subjects in Botany—Plant Group, Plant.
2. In the Subjects in Agriculture—Caltivar Group, Cultivar.

3. In the Subjects in Zoology—Animal Group. Animal
4. In the Subjects in Animal Husbandry—Animal. Organ.
5. In the Subjects in Medicine—Human Body. Organ.

Social Sciences

- 1 In the Subjects in Education—Child. Adolescent. Adult. Genius. Imbecile. Blind.
- 2 In the Subjects in History and Political Science—Head of the State. Executive. Legislature. Parly. Public. Local Body. Judiciary. Civil Service
- 3 In the Subjects in Sociology—Rural Folk, City Folk. Professional Group. Working Class, Nomads. Aryans. Semetics. Hindus. Christians. Muslims. Indians. Chinese. British.
- 4 In the Subjects in Law—Legal Personality. State. Association. Property. Contract. Treaty. Tort. Crime, Cause of Action. Court.

Humanities

- 1 In the Subjects in Linguistics—Language, Phoneme. Syllable. Word. Phrase. Clause. Sentence. Piece of Composition. Punctuation
- 2 In the Subjects in Religion—Vedic Religion. Hinduism. Vaishnavism. Saivism, Jainism. Buddhism. Christianity. Islam. Shintoism. Sikhism. Zoroastrianism. Sacred Book. Church. Sects.
- 3 In the Subjects in Psychology—Child. Adolescent. Adult. Genius. Imbecile. Blind.
- 4 In the Subjects in Literature—Poetry. Drama. Fiction. Author. Work.

Mathematics

- 1 In the Subjects in Arithmetic—Prime Number. Partition of Numbers. Arithmetical Function.
- 2 In the Subjects in Differential Equation—Linear, Quadratic, Cubic, Quartic. Quintic, Sextic. First Order, Second Order, Third Order. Fourth Order. Fifth Order, Sixth Order.
- 3 In the Subjects in astronomy—Earth. Moon. Sun. Planet. Meteor. Star.

Physical Sciences

1 In the Subjects in Properties of Matter—Solid. Glass. Crystal. Liquid-Surface. Liquid. Gas.

2 In the Subjects in Sound—Audible Sound. Infra Sound. Ultra Sound.

3 In the Subjects in Radiation—Light. Ultra-Violet Ray. X-ray. Gamma Ray. Infra-Red Ray. Hertzian Wave.

4 In the Subjects in Nuclear Physics—Neutron. Nutrino. Proton. Beta Ray. Meson. Cosmic Ray.

5 In the Subjects in Chemistry—Inorganic Substance. Hydrogen. Calcium. Aluminium. Carbonn. Bismuth. Oxygen. Flourine. Ion. Metal. Non-Metal. Alloy. Basic Oxide. Acid. Salt. Organic Substance. Methane. Phenolphthalein. Carbohydrate. Starch. Aromatic Compound. Benzene. Heterocyclic Compound. alkaloid. Amino Acid. Protein. Vitamin. Hormone. Chlorophyll. Enzyme.

22. Identification of the Isolate Ideas

The indication, by the title of a document, of the Isolate Facets of its subject may be either (1) Explicit, or (2) Implicit in the Context, or (3) Hidden within a derived composite term, or (4) absent. The basic subject of the document will be of help in sensing the absence of th indication of a necessary facet of the compound subject. Experience will develop this capacity for sensing this. In that case the contents page or even the whole document should be perused to find the absent isolates, if any. Again, experience will develop the capacity to sense the derived composite terms in a title and to break it into its fundamental constituent terms. Some examples are given in the succeeding section. In each example, against each isolate idea, the appropriate symbol is given to indicate the fundamental category of which it can be deemed to be a manifestation. Here are some examples.

Symbols used :

- (BF) = Basic Facet
- (E) = Energy Facet
- (M) = Matter Facet
- (P) = Personality Facet
- (S) = Space Facet
- (T) = Time Facet

Title	Basic and Isolate Facets
EXPLICIT	
11 Coal Washing	Mining (BF). Coal (P). Washing (E)
12 Control of Virus disease of the stem of rice plant in the winter of 1967 in Madras	Agriculture (BF). Control (E). Virus disease (M). Stem (P). Rice plant (P). Winter (T). 1967 (T). Madras (S).
13 Election of the President of the Congress Party in India in 1967	History (BF). Election (E). President (P). Congress Party (P). India (S). 1967 (T).
IMPLICIT	
(The implied facets are in italics)	
21 The structure of Protein and electron microscope	Chemistry (BF). Structure (M). Protein (P). Determination (E). Electron microscope (M).
22 X-Ray diagnosis in cow farming	Animal husbandry (BF). X-RAY (M). Diagnosis (E). Disease (M). Cow (P).
23 Tape-record and protection of the folksongs of the Todas	<i>Sociology</i> (BF). <i>Tape-record</i> (M). <i>Protection</i> (E). <i>Dying out</i> (M). <i>Folk songs</i> (M). <i>Todas</i> (P)
HIDDEN WITHIN A DERIVED COMPOSITE TERM	
(The hidden facets are in italics)	
31 Phthisis	<i>Medicine</i> (BF). <i>Lungs</i> (P). <i>Tubercular disease</i> (M).
32 Indian franchise in 1967	<i>History</i> (BF). <i>India</i> (P). <i>Citizens</i> (P). <i>Franchise</i> (M). 1967 (T).
33 Birth control essential in India today (1966)	<i>Sociology</i> (BF). <i>Overpopulation</i> (M). <i>Prevention</i> (E). <i>Birth control</i> (M). <i>India</i> (S). <i>Today</i> (T).

3 Qualifiers or speciators to facets

Consider a facet "Ford mustang car". This facet has the concept "Car" and the idea "Ford Mustang" which is a brand name. Similarly, "Racing Car" has the concepts "Car" and "Racing" which is the purpose of the car. Again, "Left-hand Drive Car" has the concepts "Car" and "Left hand drive" is a mode of driving. In each of the above cases, "Car" is the principal idea qualified by one or other of

the qualifier or "speciator" as Ranganathan has named it. A facet can have a number of qualifiers such as "Ford Mustang Left-hand Drive Racing Car". This is structured as: "Car-Ford Mustang-Racing-Left-hand Drive". This sequence among speciator is determined by the Wall-Picture Principle. A facet having one or more speciators is called a compound facet.

C FACET SEQUENCE

0 Postulates for Facet Sequence

After determining the various facets occurring in a Compound Subject, we should arrange them in a helpful sequence. In doing so, the five postulates stated in the next five sections are of help.

1 Postulate of First Facet

In a Compound Subject, the Basic Facet should be the first facet.

Every Compound Subject should have a Basic Facet. Again, Isolate Facets can form a subject, if and only if they are attached to a Basic Facet. Helpfulness requires that all the Compound Subjects going with a Basic Facet should be arranged together. To secure this, the Basic Facet should be given the First Position among the facets of a Compound Subject.

2 Postulate of Concreteness

The five fundamental categories fall into the following sequence, when arranged according to their decreasing concreteness : P, M, E, S, T.

This Postulate conforms to what the majority of persons think in respect of the relative concreteness of the isolates which are manifestations of any one of the five fundamental categories.

3 Postulate of Facet Sequence within a round

In any Round of facets of a Compound Subject in which each of any of the fundamental categories-Personality, Matter, and Energy-occurs only once, their sequence should be : personality Facet, Matter Facet, and Energy Facet.

4 Postulate of facet sequence within the last round

In the last Round of facets of a Compound Subject, in which each of the fundamental categories other than Energy may occur and

occurs only once, the sequence of the facets should be Personality Facet, Matter Facet, Space Facet, and Time Facet.

5 Postulate of Level Cluster

Facets of different levels of the same fundamental category within a Round of facets in a Compound Subject should be kept together.

The helpfulness of these five postulates in securing helpful sequence of subjects can be seen with the help of the examples given in the next two sections.

6 Subjects with not more than one Isolate Facet

Let us consider the six subjects given below in Col 2. In Co, 3, the facets of the subjects are arranged in accordance with the Postulate of First Facet.

SN	Subject	Facet Sequence
0	Agriculture (BF).	Agriculture (BF).
1	Agriculture (BF). in Dry period (T1).	Agriculture (BF). Dry period (T1).
2	Agriculture (BF), in Madras (S).	Agriculture (BF). Madras (S1).
3	Up-rooting (E), in Agriculture (BF).	Agriculture (BF). Up-rooting (IE).
4	Agricultural (BF). Disease (M) (Property).	Agriculture (BF). Disease (IMI).
5	Agriculture (BF), of Rice plant (P).	Agriculture (BF). Rice plant (IPI).

In these six subjects, Agriculture (BF) is common. Therefore, the sequence of the subjects is to be determined only by their respective isolate facets. Judged by the Postulate of Concreteness, the six subjects, as arranged above, stand in the increasing sequence of concreteness.

7 Subject with many facets in many rounds

Let us consider the sequence of the 70 subjects given in Col 2 in the following table. The fundamental category, of which concept denoted by each kernel term is a manifestation, is indicated with the notation explained elsewhere. It will be seen how the Rounds and the levels within the Rounds to which each isolate denoted by the

respective kernel terms have been assigned Col 3 of the Table gives the facet sequence in the respective subjects.

SN	Subject	Facet Sequence
1	Agriculture (BF).	Agriculture (BF).
2	Agriculture (BF), in Dry period (T).	Agriculture(BF). Dry period (T).
3	Agriculture (BF), in Dry period (T), in Madras (S).	Agriculture (BF). Madras (SI). Dry period (T1).
4	Up-rooting (E), in Agriculture (BF).	Agriculture (BF). Up-rooting (IE).
5	In Agriculture (BF). Up-rooting (E), in Dry period (T1).	Agriculture (BF). UP-rooting (IE). Dry period (T1).
6	In Agriculture (BF). Up-rooting (E), in Dry period (T), in Madras (S).	Agriculture (BF). Up-rooting (IE). Madras (SI). Dry period (T1).
7	Agriculture (BF). Disease (M).	Agriculture (BF). Disease (IMJ).
8	Agricultural (BF). Disease (M), in Dry period (T).	Agriculture (BF). Disease (IMJ). Dry period (T1).
9	Agricultural (BF). Disease (M), in Dry period (T), in Madras (S).	Agriculture (BF). Disease (IMJ). Madras (SI). Dry period (T1).
10	prevention (E), of Agricultural (BF). Disease (M).	Agriculture (BF). Disease (IMJ). Prevention (IE).
11	Prevention (E), of Agricultural (BF). Disease (M), in Dry period (T).	Agriculture (BF). Disease (IMJ). Prevention (IE), Dry period (T1).
12	Prevention (E), of Agricultural (BF). Disease (M), in Dry period (T), in Madras (S).	Agriculture (BF). Disease (IMJ). Prevention (IE). Madras (SI). Dry period (T1)-
13	Prevention (E), of Agricultural (BF). Disease (M). with Chemicals (M).	Agriculture (BF). Disease (IMJ). Prevention (IE).Chemicals (Sp to E).
14	Prevention (E), of Agricultural (BF). disease (M), with Chemicals (M), in Dry period (T).	Agriculture (BF). Disease (IMJ). Prevention (IE). Chemicals (Sp to E) Dry period (T1).

SN	Subject	Facet Sequence
15	Prevention (E), of Agricultural (BF). Disease (M), with Chemicals (M), in Dry period (T), in Madras (S).	Agriculture (BF), Disease (IM1) Prevention (IE), Chemicals (Sp to E) Madras (SI). Dry period (TT).
16	Virulence (M), of Agricultural (BF). Disease (M).	Agriculture (BF). Disease (IM1). Virulence (IM2).
17	Virulence (M), of Agricultural (BF). Disease (M), in Dry period (T).	Agriculture (BF). Disease (IM1) Virulence (IM2). Dry period (TT).
18	Virulence (M), of Agricultural (BF). Disease (M), in Dry period (T), in Madras (S).	Agriculture (BF). Disease (IM1). Virulence (IM2). Madras (SI). Dry period (TT).
19	Prevention (E), of Virulence (M), in Agricultural (BF). Disease (M).	Agriculture (BF). Disease (IM1). Virulence (IM2). Prevention (IE).
20	Prevention (E), of Virulence (M), in Agricultural (BF). Disease (M), in Dry period (T).	Agriculture (BF). Disease (IM1) Virulence (IM2). Prevention (IE). Dry period (TT).
21	prevention (E), of Virulence (M), in Agricultural (BF). Disease (M), in Dry period (T), in Madras (S).	Agriculture (BF). Disease (IM1). Virulence (IM2). Prevention (IE). Madras (SI). Dry period (TT).
22	Prevention (E), of Virulence (M), in Agricultural (BF). Disease (M), with Chemicals (Sp to E).	Agriculture (BF). Disease (IM1). Virulence (IM2). Prevention (IE). Chemicals (Sp to 2E).
23	Prevention (E), of Virulence (M), in Agricultural (BF), disease, (M), with Chemical (Sp to E) in Dry period (T).	Agriculture (BF). Disease (IM1). Virulence (IM2). Prevention (IE). Chemicals (Sp to E). Dry period (TT).
24	Prevention (E), of Virulence (M), in Agricultural (BF). Disease (M), with Chemicals (Sp to E), in Dry period (T), in Madras (S).	Agriculture (BF). Disease (IM1). Virulence (IM2). prevention (IE). Chemicals (Sp to E) Madras (SI). Dry period (TT).
25	Agriculture (BF), of Rice plant (P).	Agriculture (BF). Rice plant (IP).

SN	Subject	Facet Sequence
26	Agriculture (BF). of Rice plant (P). in dry period (T).	Agriculture (BF). Rice plant (IP). Dry period (TI).
27	Agriculture (BF). of Rice plant (P). in Dry period (T). in Madras (S).	Agriculture (BF) Rice plant (IP). Madras (SI). Dry period (TI).
28	In Agriculture (BF). Uprooting (E). of Rice plant (P).	Agriculture (BF). Rice plant (IP). Up-rooting (IE).
29	In Agriculture (BF). Up-rooting (E). of Rice plant (P). in Dry period (T).	Agriculture (BF). Rice plant (IP). Up-rooting (IE). Dry period (TI).
30	In Agriculture (BF). Up-rooting (E). of Rice plant (P). in Dry period (T) in Madras (S).	Agriculture (BF). Rice plant (IP). Up-rooting (IE). Madras (SI). Dry period (TI).
31	In Agriculture (BF). Disease (M). of Rice plant (P).	Agriculture (BF). Rice plant (IP). Disease (IMI).
32	In Agriculture (BF). Disease (M). of Rice plant (P). in Dry period (T).	Agriculture (BF). Rice plant (IP). Disease (IMI). Dry period (TI).
33	In Agriculture (BF). Disease (M). of Rice plant (P). in Dry period (T). in Madras (S).	Agriculture (BF). Rice plant (IP). Disease (IMI). Madras (SI). Dry period (TI).
34	In Agriculture (BF). Prevention (E). of the Disease (M). of Rice plant (P).	Agriculture (BF). Rice plant (IP). Disease (IMI). Prevention (IE).
35	In Agriculture (BF). Prevention (E). of the Disease (M). of Rice plant (P). in Dry period (T).	Agriculture (BF). Rice plant (IP). Disease (IMI). Prevention (IE). Dry period (TI).
36	In Agriculture (BF). Prevention (E). of the Disease (M). of Rice plant (P). in Dry period (T). in Madras (S).	Agriculture (BF). Rice plant (IP). Disease (IMI). Prevention (IE). Madras (SI). Dry period (TI).
37	In Agriculture (BF). Prevention (E). of the Disease (M). of Rice plant (P). with Chemicals (Sp to E).	Agriculture (BF) . Rice plant (IP). Disease (IMI). Prevention (IE). Chemicals (Sp to 2E).

SN	Subject	Facet Sequence
38	In Agriculture (BF). Prevention (E). of the Disease (M). of Rice plant (P) with Chemicals (Sp to E). in Dry period (T).	Agriculture (BF). Rice plant (IP). Disease (IM). Prevention (IE). Chemicals (Sp to E)
39	In Agriculture (BF). Prevention (E). of the Disease (M). of Rice plant (P). with Chemicals (M). in Dry period (T). in Madras (S).	Agriculture (BF). Rice plant (IP). Disease (IM). Prevention (IE). Chemicals (Sp to E). Madras (SI). Dry period (TT).
40	In agriculture (BF). Virulence (M). of the Disease (M). of the Rice plant (P).	Agriculture (BF). Rice plant (IP). Disease (IM). Virulence (IM2).
41	In Agriculture (BF). Virulence (M). of the Disease (M). of the Rice plant (P). in Dry period (T).	Agriculture (BF). Rice plant (IP). Disease (IM). Virulence (IM2). Dry period (TT).
42	In Agriculture (BF). Virulence (M). of the Disease (M). of the Rice plant (P). in Dry period (T). in Madras (S).	Agriculture (BF). Rice plant (IP). Disease (IM). Virulence (IM2). Madras (SI). Dry period (TT).
43	In Agriculture (BF). Prevention (E). of the Virulence (M). of the Disease (M). of the Rice plant (P).	Agriculture (BF) Rice plant (IP). Disease (IM). Virulence (IM2). Prevention (IE).
44	In Agriculture (BF). Prevention (E). of the Virulence (M). of the Disease (M). of the Rice plant (P). in Dry period (T).	Agriculture (BF). Rice Plant (IP). Disease (IM). Virulence (IM2). Prevention (IE). Dry period (TT).
45	In Agriculture (BF). Prevention (E). of th Virulence (M). of the Disease (M). of the Rice plant (P). in Dry period (T). in Madras (S).	Agriculture (BF). Rice plant (IP). Disease (IM). Virulence (IM2). Prevention (IE). Madras (SI). Dry period (TT).
46	In Agriculture (BF). prevention (E). of the Viluence (M). of the Disease (M) of the Rice Plant (P). with Chemicals (M).	Agriculture (BF). Rice plant (IP). Disease (IM). Virulence (IM2). Prevention (IE). Chemicals (Sp to E).

SN	Subject	Facet Sequence
47	In Agriculture (BF). prevention (E). of the Virulence (M). of the Disease (M). of the Rice plant (P). with Chemicals (M). in Dry period (T).	Agriculture (BF). Rice plant (IP1). Disease (IM1). Virulence (IM2). Prevention (IE). Chemicals (Sp to E). Dry period (TT).
48	In Agriculture (BF). Prevention (E). of the Virulence (M). of the Disease (M). of the Rice plant (P). with Chemicals (Sp to E). in Dry period (T). in Madras (S).	Agriculture (BF). Rice Plant (IP1). Disease (IM1). Virulence (IM2). Prevention (IE). Chemicals (2MI). Madras (SI). Dry period (TT).
49	In Agriculture (BF). Stem (P). of Rice plant (P).	Agriculture (BF). Rice plant (IP1). stem (IP2).
50	In Agriculture (BF). Stem (P). of Rice plant (P). in Dry period (T).	Agriculture (BF). Rice plant (IP1). Stem (IP2). Dry period (TT).
51	In Agriculture (BF). Stem (P). of the Rice plant (P). in Dry period (T). in Madras (S).	Agriculture (BF). Rice plant (IP1). Stem (IP2). Madras (SI). Dry period (TT).
52	In Agriculture (BF) Disease (M). of the Stem (P). of the Rice plant (P).	Agriculture (BF). Rice plant (IP1). Stem (IP2). Disease (IM1).
53	In Agriculture (BF) Disease (M). of the Stem (P). of the Rice plant (P). in Dry period (T).	Agriculture (BF). Rice plant (IP1). Stem (IP2). Disease (IM1). Dry period (TT).
54	In Agriculture (BF). Disease (M). of the Stem (P). of the Rice plant (P). in Dry period (T). in Madras (S).	Agriculture (BF). Rice plant (IP1). Stem (IP2). Disease (IM1). Madras (SI). Dry period (TT).
55	In Agriculture (BF). Prevention (E) of the Disease (M). of the Stem (P). of the Rice plant (P).	Agriculture (BF). Rice plant (IP1). Stem (IP2) Disease (IM1). Prevention (IE).
56	In Agriculture (BF). Prevention (E). of the Disease (M). of the Stem (P). of the Rice plant (P). in Dry period (T).	Agriculture (BF). Rice plant (IP1). Stem (IP2). Disease (IM1). Prevention (IE). Dry period (TT).

SN	Subject	Facet Sequence
57	In Agriculture (BF). Prevention (E). of the Disease (M). of the Stem (P). in Dry period (T). in Madras (S).	Agriculture (BF). Rice plant (IP). Stem (IP2). Disease (IM). Prevention (IE). Madras (SI). Dry period (TI).
58	In Agriculture (BF). Prevention (E). of the Disease (M). of the Stem (P). of the Rice plant (P). with Chemicals (Sp to E).	Agriculture (BF). Rice Plant (IP). Stem (IP2). Disease (IM). Prevention (IE). Chemicals (Sp to E).
59	In Agriculture (BF). Prevention (E). of the Disease (M). of the stem (P). of the Rice plant (P). with Chemicals (Sp to E). in Dry period (T).	Agriculture (BF). Rice plant (IP). Stem (IP2). Disease (IM). Prevention (IE). Chemicals (Sp to E). Dry period (TI).
60	In Agriculture (BF). Prevention (E). of the Disease (M). of the Stem (P). of the Rice plant (P). with Chemicals (Sp to E). in Dry period (T). in Madras (S).	Agriculture (BF). Rice Plant (IP). Stem (IP2). Disease (IM). Prevention (IE). Chemicals (Sp to E). Madras (SI). Dry period (TI).
61	In Agriculture (BF). Virulence (M) of the Disease (M) of the Stem (P). of the Rice plant (P).	Agriculture (BF). rice plant (IP). Stem (IP2). Disease (IM). Virulence (IM2).
62	In Agriculture (BF). Virulence (M). of the Disease (M) of the Stem (P) of the Rice plant (P). in Dry period (T).	Agriculture (BF). Rice plant (IP). Stem (IP2). Disease (IM). Virulence (IM2). Dry period. (TI).
63	In Agriculture (BF) Virulence (M). of the Disease (M). of the Stem (P) of the Rice plant (P). in Dry period (T). in Madras (S).	Agriculture (BF). Rice plant (IP). Stem (IP2). Disease (IM). Virulence (IM2). Madras (SI). Dry Period (TI).
64	In Agriculture (BF). prevention (E). of the Virulence (M). of the Disease (M) of the Stem (P). of the Rice plant (P).	Agriculture (BF). Rice plant (IP). Stem (IP2). Disease (IM). Virulence (IM2). Prevention (IE).

SN	Subject	Facet Sequence
65	In Agriculture (BF). Prevention (E). of the Virulence (M). of the Disease (M) of the Stem (P). of the Rice plant (P). in Dry period (T).	Agriculture (BF). Rice plant (IP1). Stem (IP2). Disease (IM1). Virulence (IM2). Prevention (IE). Dry period (TT).
66	In Agriculture (BF). Prevention (E). of the Virulence (M). of the Disease (M) of the Stem (P). of the Rice plant (P). in Dry period (T). in Madras (S).	Agriculture (BF). Rice plant (IP1). Stem (IP2). Disease (IM1). Virulence (IM2). Prevention (IE). Madras (S1). Dry period (TT).
67	In Agriculture (BF). Prevention (E). of the Virulence (M). of the Disease (M). of the stem (P). of the Rice plant (P). with Chemicals (Sp to E).	Agriculture (BF). Rice plant (IP1). Stem (IP2). Disease (IM1). Virulence (IM2). Prevention (IE). Chemicals. (Sp to E).
68	In Agriculture (BF). Prevention (E). of the Virulence (M). of the Disease (M) of the Stem (P). of the Rice plant (P). of the Rice plant (P). with Chemicals (Sp to E). in Dry period (T).	Agriculture (BF). Rice plant (IP1). Stem (IP2). Disease (IM1). Virulence (IM2). Prevention (IE). Chemicals (Sp to E) Dry period (TT).
69	In Agriculture (BF). Prevention (E). of the Virulence (M). of the Disease (M) of the Stem (P). of the Rice plant (P). with Chemicals (Sp to E). in Dry period (T). in Madras (S).	Agriculture (BF). Rice plant (IP1). Stem (IP2). Disease (IM1). Virulence (IM2). Prevention (IE). Chemicals (2M1). Madras (S1). Dry period (TT).
70	In Agriculture (BF). Distribution (E). of the Chemicals (Sp to E) with Sprayer (M). to prevent (E). the Virulence (M). of the Disease (M). of the Stem (P). of the Rice plant (P). in Dry period (T). of 1967 (T). in the Cauvery Delta (S). of Madras (S).	Agriculture (BF). Rice plant (IP1). Stem (IP2). Disease (IM1). Virulence (IM2). Prevention (IE). Chemicals (Sp to E) Distribution (2E). Sprayer (JM1). Madras (S1). Cauvery Delta (S2). 1967(TT). Dry period (T2).

The sequence of the subjects (given above) can be seen to be helpful. It conforms to the Canon of Decreasing Extension. It may be particularly noted that the Postulate of Level Cluster is satisfied in the facet sequence of subjects as found in Col.

- 1 Time level Clusters are kept together in facet sequence of the Subject 70;
- 2 Space Level Clusters are kept together in the facet sequence of the Subject 70;
 - 3 Energy level clusters are not possible.
- 4 Matter level Clusters are kept together in the facet sequence of each of the subject 16 to 24, 40 to 48, 61 to 70; and
- 5 Personality level Clusters are kept together in the facet sequence of each of the subjects 49 to 70.

The above Postulates do not by themselves decide in which Round and in which level a particular isolate facet of a Compound Subject should lie.

8 Principle of inversion

Helpful sequence among the six Compound Subjects in Sec 6 is in the increasing measure of their concreteness. But, the sequence of facets in the facet structure of a compound Subject is the inverse—that is, as we move from the Basic Facet, the arrangement of the isolate facets is in the decreasing measure of their concreteness. This is called the Principle of Inversion. This principle is of help in determining the sequence, not only of the Facets, but also of the components of a super-imposed isolate.

D PRINCIPLES FOR SEQUENCE OF FACETS

1 Wall-Picture Principle

A sequence of facets of a subject giving satisfaction to the intellect may be called the syntax of facets. The syntax of facets is essentially based on a set of postulates. The postulates that stimulate the sequence are themselves based on a principle known as the Wall-Picture Principle. This principle is stated as follows: "If two facets A and B of a subject, going with a basic subject, are such that the concept behind B will not be operative unless the concept behind A is conceded,

even as a mural is not possible unless the wall exists to draw upon, then the facet A should precede the facet B".

Example : In the subject "Treatment of the diseases of the human eye", the concept behind "Disease" will not become operative unless the concept behind "Eye" is conceded. Therefore, these two facets should be put in the sequence "Eye, Disease". Similarly, the concept behind "Treatment" will not be operative unless the concept behind "Disease" is conceded. Therefore, these two facets should be put in the sequence "Disease, Treatment". Thus, the sequence of the facets in the subject will be "Medicine, eye, Treatment".

2 Actand-Action-Actor-Tool principle

One of the associated principles to the Wall-Picture Principle is the Result-Actand-Action-Actor-Tool Principle. This principle states: "If in a subject, facet C denotes Action on facet B, which is Actand by Facet D as Actor with Facet E as the tool, and facet A is the commodity or Result of the action, then the five facets should be arranged in the sequence A, B, C, D, and E.

For Example, in the "Spinning of cotton with charkha by girls, thus producing the commodity yarn", Action is "Spinning", the Actand is "Cotton", the Actor is "Girls", the tool is "Charkha" and the commodity or result is "Yarn". Therefore, the sequence of facets will be "Yarn", "Cotton", "Spinning", "Girls" and "Charkha".

3 Whole Organ Principle

Another associated principle which is helpful in determining the sequence of facets is the whole-Organ principle.

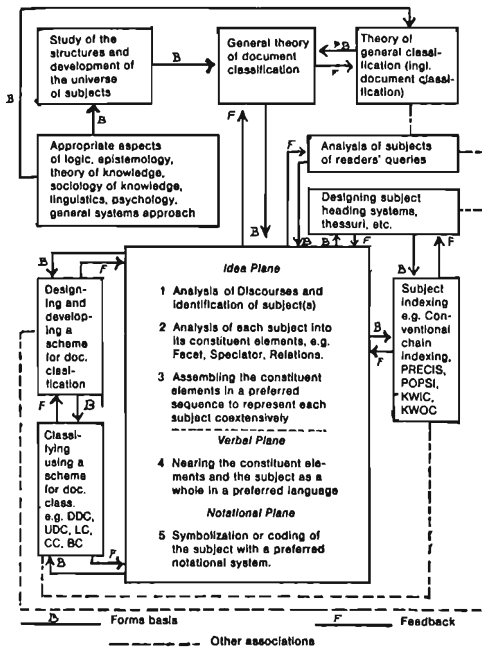
If, in a subject, facet "B" is an organ of facet "A", then A should precede B.

For example, in the "Repair of Damage to the Engine of an automobile", the facet "Engine" is an organ of "Automobile". Thus the sequence should be "Automobile, Engine".

E APPLICATIONS OF FACET ANALYSIS

The Role of facet analysis in Information Processing and in particular Information storage and Retrieval is indicated in the following diagram.

INTERRELATION BETWEEN DISCOURSE/SUBJECT
ANALYSIS, CLASSIFICATION, SUBJECT INDEXING,
SUBJECT HEADING WORK, THESAURI, ETC



F FACET ANALYSIS-PRACTICAL STEPS

Facet analysis in practice proceeds in eight steps. The last four steps are directed towards constructing a Class Number. As the diagram in the last section shows we may take off from step 5 in three ways:

- a) to arrive at a subject heading;
- b) to build a string of subjects for the saurus compilation;
- c) to arrive at the Class Number.

In the examples here, we are only indicating how to arrive at the Class Number according to two different schemes, CC and UDC.

The succeeding part of the section describes the steps and illustrates them with one or two examples.

Steps	Examples
Step. 1. Raw title	
The title of the article as it is found on the title section or on the title page of the document	"Direct fungal infection of the eye in Britain" is the Title of article written by B R Jones (In Trans Ophthalmol, Soc, UK, 89, 1970, 722-41)
Step. 2. Expressive Title	
The name of the subject is expressed in such a way that it brings out each and every one of the facets implicit in this specific subject. This may require addition of missing terms. It may also require breaking of composite terms into its fundamental constituent terms.	In medicine, Direct fungal infectious disease of the eye in Great Britain.
Step 3. Kernal terms	
Only kernal terms denoting the kernal ideas are retained. The auxiliary and apparatus words are removed. The terms	(e.g.) Medicine, Eye, Fungal Infection, Disease. Great Britain.

are separated by each other by a full stop.

Step 4. Analysed title

The basic subject term is labelled (BS). Each of the other facet terms is labelled by the abbreviation of the fundamental category of which it is deemed to be a manifestation and the round and level to which it belongs, such as [IPT] for Personality facet Round 1 Level 1, [IMI] for Matter Round 1 Level 1, etc.

(eg) Medicine (BS). Eye (IPT).
Fungal infection (Sp)
Disease (IMI). Great
Britain (SI)

Step 5. Transformed Title

The Kernal terms along with their abbreviations are rearranged according to postulates/principles for helpful sequence.

(eg) Medicine (BS). Eye (IPT).
Disease (IMI). Fungal
infection (Sp to IMI). Great
Britain (SI).

Step 6. Title in Standard terms

The kernal terms are replaced by their respective standard terms found in the schedule of the scheme for classification used.

(eg) Medicine (BS). Eye (IPT).
Disease (IMI). Fungal
infection (Sp to IMI). Great
Britain (SI).

Step 7. Title in Kernal numbers

The basic subject term and each of the isolate terms are replaced by their respective numbers found in the schedule of the scheme for classification used.

(eg) L (BS). 185 (IPT).
4 (IMI), 33 (Sp to IMI)
56 (SI).

for UDC
(eg) 61 (BS). 77 (IPT).
616 (IMI).

V(F)

GOPINATH

993 (sp to IMI).

410 (S1).

Step 8. Class Number

All the labels and full steps in the kernel title numbers are removed. The appropriate indicator digit or digit-group if any, is prefixed to each of the facet numbers.

(eg) for CC:

L, 185; 433. 56

(eg) for UDC

617, 7:616. 993 (410)

Example 2

Step. 1 Raw title

O'Connor (EF)

Uses of copper salts for inhibition of external fouling of peat fired boiler. (J. Inst., Fuel 43; 1970; 449-50).

Step 2. Expressive title

In Commodity Production Engineering, use of copper sulphate for inhibition of external fouling of peat fired water tube boilers.

Step 3. Kernel title

Commodity Production Engineering. Copper sulphate. Inhibition. External fouling. Peat fired. Water tube. Boiler.

Step 4. Analysed title

Commodity Production Engineering (BS). Copper sulphate (Sp to 1E). Inhibition (1E). External fouling (IMI) Peat fired (Sp to IPI). Water tube (Array division to IPI). Boiler (IPI).

Step 5. Transformed title

Commodity Production Engineering (BS). Boiler (IPI). Water tube (Array division to (IPI)). Peat fired (Sp to IPI). External fouling (IMI).

- Inhibition (IE). Copper sulphate (Sp to IE).
- Step 6. Title in Standard terms Commodity Production Engineering (BS) Steam generator (IPI). Peak fired (Sp to IPI). External corrosion (IMI) Prevention (IE). Copper sulphate (sp to IE).
- Step 7. Title in kernel numbers (eg) for CCB
 D8 (BS). D4 (IPI). h (Array division to IPI). C8 (Sp to IPI) 4g (IMI). 85 (IE). (CuSO4) (Sp to IE).
- (eg) for UDC
 621 (BS). 18(IPI). 620, 19 (IMI) 7 (IE) (CuSO4) (Sp to IE).
- Step 8. Class number (eg) for CC
 D8, 4th-C8; 4g; 85 (CuSO4)
- (eg) for UDC
 621. 18:620. 197 (CuSO4)*
- Example 3**
- Step 1. Raw title Appuraj (VE) and Walson (AP). Observations on the inhibitory effect of sodium chloride on molds met within smoked fishery products. (Fishery Technol. 3;) 966;158-59).
- Step 2. Expressive title In Food technology, prevention of the inhibitory effects of sodium chloride on molds met within smoked fishery products.
- Step 3. Kernel title Food technology. Prevention Inhibitory effect. Sodium chloride

(VF)

GOPINATH

Mold. Smoked. Fishery product.

- Step 4. Analysed title Food technology (BS). Prevention (IE). Inhibitory effect (IIM). Sodium Chloride (Sp to IE). Mold (Sp to IMI). Smoked (Sp to IPI). Fishery product (IPI).
- Step 5. Transformed title Food technology (BS). Fishery product (IPI). Smoked (Sp to IPI). Inhibitory effect (IMI). Mold (Sp to IMI). Prevention (IE). Sodium chloride (sp to IE).
- Step 6. Title in standard terms Food technology (BS). Prevention (IE). Inhibitory effect (IMI). Sodium chloride (Sp to IMI). Prevention (IE). Sodium chloride (sp to IE).
- Step 7. Title in kernel numbers (eg) for CC:
F83 (BS). 3Zn (IPI).
0 (a 6;k) (Sp to IPI).
4 (IMI). 33 (Sp to IMI).
85 (IE).(NaCl) (Sp to IE).
(eg) for UDC:
664(BS). 95(IPI). 12(Sp to IPI). 632 (IMI). 4 (Sp to IMI). (NaCl) (Sp to IE)
- Step 8. Class number (eg) for CC:
F83, 3Zn-0(a6;k)2 433-85-(NaCl)
(eg) for UDC:
664. 9512:632.4.(NaCl).

G ABSOLUTE SYNTAX OF IDEAS

The subject-structure derived on the basis of Facet analysis technique has been found to reflect majority of users approach to information. This may not coincide with the linguistic syntax—that is, the

syntax of words — in all languages. It is conjectured that this syntax of facets may parallel the absolute syntax. Absolute syntax is defined as the sequence of the component ideas in a subject helpful and acceptable to a majority of the users.

If the syntax for facets is made to conform to Absolute Syntax, the resulting structure of subject is likely to be:

1. Helpful to a majority of normal intellectuals;
2. Consistent in pattern in subjects falling in different subject-fields;
3. Relatively more stable and continue to be helpful to a majority of normal intellectuals so long as there is no mutation in their mode of thinking;
4. Free from aberration due to variations in linguistic syntax from the use of the verbal plane in naming subjects;
5. Capable of representing and indicating of subjects co-extensively with a minimum number of variety of component elements;
6. Helpful in recognising the less explored and unexplored regions in the universe of ideas; and
7. Helpful in probing deeper into the pattern of human thinking and modes of combination of ideas.

Thus, in general, the Facet Analysis approach to structuring of a subject aims at a mechanism for organisation for information that will be harmonious with the user approach to information.

This in turn would improve the efficiency of an Information Storage Retrieval, and Dissemination Systems.

Reference

1. RANGANATHAN (S R) Prolegomena to Library Classification. Ed.3, 1967 Part R and Part X.