DEEP STRUCTURE OF SIL

1 INTRODUCTION

Chapter F enumerates a set of postulates and working concepts pertaining to SILs. In their presentation, special attention has been paid to make the set coherent and complete. For this reason, some of the concepts dealt with in earlier chapters have been repeated. But all of them have been presented in a distinct style. This set of postulates and working concepts is necessary to design a specific purpose-oriented SIL. Further, to be scientific in design work, it is essential to conceive a source-structure of SILs.

A specific purpose-oriented SIL may be deemed to be a surface structure of a deep structure of SIL. Through a logical abstraction of the results of analyses of the surface structures of the different outstanding SILs, it has been possible to arrive at a deep structure of SIL. This chapter is devoted to deal with the deep structure of SIL, conceived through logical abstraction. For all practical purposes, the deep structure of SIL presented in this chapter may be regarded as a postulated one.
D = Discipline
E = Entity
A = Action
P = Property
m = Modifier
3 POSTULATES OF THE DEEP STRUCTURE OF SIL

The following are the postulates associated with the deep structure of SIL:

1. The sequence of manifestations in compound subject propositions is governed by the policy of classification — organizing classification, or associate classification;
and by the decision about the Base and the Core.

(2) **Basic Sequence**: The sequence, D followed by E (both modified or unmodified) appropriately interpolated by A and P (both modified or unmodified) is a logical sequence of the elements of a Basic Chain manifesting in a Compound subject-proposition. Any A or P may have A and/or P directly related to it. They always go with the A or P to which they are related. This sequence may be used as the basis for generating an organizing classification; and which in turn may form the basis of associative classifications. For this reason, this sequence may be called the Basic Sequence or Basic Chain. The logic behind this postulate is based on the purpose of generating a "General to Specific" sequence in the vertical arrangement of subject propositions.

(3) **Source Organizing Classification**: The basic sequence of manifestations augmented by the interpolation and extrapolation, as the case may be, of successive superordinates of each manifestation, whenever warranted, gives rise to a Basic Modulated Chain. Basic modulated...
Chains can generate a Source Organizing Classification in alphabetical arrangement with the aid of a suitable apparatus (punctuation, notation, etc) introduced for this purpose. The basic modulated chain can be manipulated to generate chains meant for different specific purpose-oriented organizing classifications; and which in turn may form the basis of different associative classifications. This implies that there is no absolute version of organizing or associative classification. Classification is always purpose-oriented; and it is the specific purpose that determines the optimally efficient and effective version of classification. The common organizing structure of the manipulated versions of basic modulated chains constitute the surface structure of a specific SIL.

The manipulation techniques largely consist of the following:

(a) Rules for eliminating redundant superordinates, as exemplified by Cutter's language of Specific Subject Indexing, Dewey's language of Relative Indexing, Kaiser's language of Systematic Indexing, and Ranganathan's language of Chain Indexing.
(b) Rules for merging categories, as exemplified by Kaiser's language of Systematic Indexing.

(c) Rules for eliminating redundant categories, as exemplified by Kaiser's language of Systematic Indexing.

(d) Rules for analysing categories, as exemplified by the recognition of "Space" and "Time" as distinct categories by Ranganathan's language of Colon Classification.

(e) Decision about the Base and the Core, as exemplified by Dewey's language of Decimal Classification, and Ranganathan's language of Colon Classification.

(f) Rules for reversing the basic sequence, as exemplified by Dewey's language of Relative Indexing, and Ranganathan's language of Chain Indexing.

(g) Any combination of the techniques mentioned above.

These rules are all intended to achieve economy in indexing work. A little bit of details as to how the different outstanding SILs have implemented these
techniques may be taken note of here. Cutter generates his associative classification by giving "Place" (as a manifestation of Entity) the status of the Base in the compound subject-propositions having its manifestation; and treating simultaneously the manifestations of Discipline, Entity, Action, and Property as the Core in all such cases. On the other hand, he treats simultaneously the manifestations of each of the elementary categories as the Base when no manifestation of "Place" is involved. Dewey for his DC, treats the manifestations of each of the elementary categories, Action, Property, and Entity simultaneously as the Core within the Bases consisting of the manifestations of Discipline to generate his specific organizing classification. Kaiser prescribes to eliminate the category, Discipline when it occurs singly, and accommodates its manifestations by analyzing them into Entity (Concrete), and Action (Process). In all other cases of compound subject propositions, his category "Concrete" is Entity; and "Process" merges Discipline, Action, and Property. In the structure designed by him, "Concrete" is the Base, and "Process" the Core. The structure recognized by Kaiser is meant to generate associative classifications. "Place" wherever occurs, is a modifier to "Concrete"; and its sequence is permuted to generate associative classifications under the manifestations of "Place".
Ranganathan for his CC, follows the basic sequence to generate the organizing classification. He eliminates the redundant superordinates, and reverses the basic sequence to generate associative classifications in his Chain Indexing.

(4) **Inter-facet Relationship in Basic Chains:** In basic chains, the relationship between any two manifestations is the Interfacet Relationship.

(5) **Modifyee-Modified Relationship:** In a modulated chain, the relationship between the Modifyee and the manifestation resulting out of its modification is the "Whole-Type" (Genus-Species) relationship.

(6) **Associative Classification Effect:** The simple cyclic permutation of each of the sought manifestation, in any style, with the indication of the structure of the subject-proposition meant for organizing classification has every effect of an associative classification. (This mechanical device has not yet been used by any SIL other than the POPSI Language).

(7) **Systematic Grouping:** Only the notational representations of modulated chains can ensure
in arrangement the ideal systematic grouping by juxtaposition. Only the alphabetical arrangement of modulated chains with suitable apparatus (notation, punctuation, etc.) is the closest approximation to the purely notational grouping.

(8) **Organizing Classification Effect:** Grouping by referencing has the organizing classification effect.

(9) Synonyms, quasi-synonyms, and antonyms can be controlled only by referencing, or by some acceptable substitute for referencing.

(10) A SIL to be optimally efficient and effective should possess the following attributes:

(a) It should make provision for all terms-of-approach.

(b) It should ensure, as far as possible, organizing classification in general, and also under each term-of-approach.

(c) It should ensure all possible associative classifications going with the different terms-of-approach, or its effect as far as possible.

(d) It should make the structure of subject-propositions for organizing classification
serve simultaneously the purpose of systematic grouping by juxtaposition, and of creating organizing classification effect by referencing.

Basic sequence-based modulated chains complemented by cyclic permutation of sought components can endow a SIL with all these attributes.

4 PRINCIPLES OF SEQUENCE OF COMPONENTS

(1) A modifier is to go with the manifestation modified; e.g. Infections disease, or Diseases - Infectious, as the policy of grouping demands. When the pattern of grouping warrants it, the modifier is to follow immediately the manifestation in relation to which it is a modifier.

(2) The determination of the sequence of two or more modifiers going with the same modifyee is to be governed by the principle mentioned above. If more than one sequences are equally valid according to this principle, the choice of any one would serve the purpose equally well. This is because, there will always be the need for permutation in such a situation. The sequence of modifiers in a grammatically correct natural language expression works alright in most of the
cases. For example, "Steel-made reading table", or "Reading table (made of) steel" works alright. The idea is that the formulation should be such that its accurate meaning is easily understandable. For this purpose, if necessary, auxiliary words such as, prepositions, conjunctions, participles, etc., are to be used. When the pattern of grouping warrants it, the reverse sequence of the sequence of modifiers in a grammatically correct natural language expression would work alright, and it would satisfy the general principle of sequence. In certain cases, it may be found easy and helpful to arrange the modifiers being governed by some principles -- such as, Ranganathan's Wall-Picture Principle, the Entity-Action Correlation Principle, and the like. According to Wall-Picture Principle, if there are two concepts A and B and if B cannot become operative unless A is conceded, then their sequence should be A followed by B. For example, in the subject "Seasoned teak wood table", the concept behind "Wooden table" cannot become operative unless the concept behind "table" is conceded; the concept "teak wood table" cannot become operative unless the concept behind "wooden table" is conceded; and similarly, the concept
behind "seasoned teak wood table" cannot become operative unless the concepts behind "teak wood table" is conceded. Therefore according to Wall-Picture Principle, the sequence of components would be "Seasoned teak wood table"; or "Table - Wooden - Teak - Seasoned"; or "Table. Wooden. Table. Teak wood table. Seasoned teak wood table", as the case may be according to the intended pattern of grouping. According to the Entity-Action Correlation Principle, if there are two modifiers A and B, of which A is based on Entity, and B on Action, then their sequence should be A followed by B. For example, in the subject "Sugarcane harvesting machinery", "sugarcane" is Entity correlated, while "harvesting" is Action correlated; and therefore, the sequence of the components should be "Sugarcane harvesting machinery"; or "Machinery - Harvesting - Sugarcane"; or "Machinery. Harvesting machinery. Sugarcane harvesting machinery"; as the case may be according to the intended pattern of grouping. It may be noted that all these principles satisfy the Principle of Natural Language Sequence, which is used either as-it-is (normal) sequence, or in reverse sequence.

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(3) Each compound subject proposition has a Base; and the Base is the first facet; e.g. in CC, Medicine is the Base in the subject "Anatomy of lungs, in medicine"; and it is the first facet.

(4) The Core follows the Base immediately; e.g. in CC, "Lungs" is the Core, and it follows Medicine (the Base) immediately in the subject "Anatomy of lungs in medicine"; and in DC, for the same subject-proposition, "Anatomy" is the Core, and it follows Medicine (the Base) immediately.

(5) An Action follows the manifestation in relation to which it is an Action — that is, Self-Action, or External Action. A Self-Action follows the manifestation in relation to which it is a self-action. An External Action follows the manifestation on which it is performed. For example, "Migration" follows "Birds" in the subject "Migration of birds". "Treatment" follows "Diseases" in the subject "Treatment of diseases of lungs".

(6) A Property follows the manifestation of which it is a property. For example, "Infections diseases" follows "Respiratory system" in the subject "Infections diseases of the respiratory system".

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(7) The principles of sequence of components
given above are always affected by the choice
of the Base, and the Core. But, the choice
itself suggests the operative principles.
There can be only the following types of syn-
tactic relationship between components of
compound subject-propositions:

(i) Inter-facet relationship;
(ii) Modifyee-modifier relationship;
(iii) Whole-type relationship (Genus-species);
    and
(iv) Whole-part relationship.

Of these relationships, the whole-type and
whole-part relationships do not change. The
change takes place between inter-facet, and
modifyee-modifier relationships. For example,
In DC, Medicine is the Base, and Anatomy (Pro-
erty) is the Core in the subject-proposition
"Anatomy of the heart in medicine". Here, the
sequence of "Heart" is decided by the principle
governing the sequence of modifiers. In this
subject-proposition, the suggested sequence
would be "Medicine; Anatomy - Heart", which is
a particular form of representing the subject-
proposition "Medicine; Anatomy; Anatomy (of)
heart". On the other hand in CC, Medicine is
the Base, and Heart (Entity) is the Core for the same subject-proposition. The sequence of all the components would be in this case as follows: Medicine, Heart; Anatomy. It may be noted that in case of CC the relationship between Heart and Disease is inter-facet; while in DE, it is modifyee-modifier relationship.

(8) The sequence of related subjects in a complex subject proposition, is governed by the decision about the Base-subject. Within each of the component subjects, the sequence of facets, wherever warranted, is regulated by the principles of sequence of facets in compound subject-propositions.

5 IMPLICATIONS OF POSTULATES OF DEEP STRUCTURE OF SIL

The set of postulates, principles, and working concepts furnished in the earlier chapters are general in nature. They hold good in relation to any one of the outstanding SILs. They can explain the individual structure of each of them, which is quite distinct from others. From this point-of-view, this coherent set of postulates, principles, working concepts, and methodologies can be regarded as hospitable, versatile, and adoptable. They together constitute the General Theory of SIL. This theory furnishes the guidelines as to the
recognition of the Base and the Core out of the elementary
categories Discipline, Entity, Action, and Property. There­
fore, being governed by the specific purpose in hand, a
set of specific postulates and principles of sequence
can be formulated to take care of the information needs
of the specific group of users. This becomes evident
from the structures of the different outstanding SILs.
That their individual structures are fully "interpretable"
in terms of the General Theory of SILs has been demonst­
rated in the later chapters. However, some of the
general implications of the General Theory of SIL are
unmistakably discernable at this stage. They are as
follows:

(1) On the basis of the set of general postulates,
principles, working concepts, and methodologies,
a "Classaurus" -- that is, a faceted systematic
scheme for classification having all the
necessary features of a thesaurus -- can be
developed as the device for vocabulary control,
which can be adapted with advantage by deciding
the Base and the Core for generating an organiz­
ing classification or its effect, as the case
may be. (12, 20).

(2) There may be several sets of specific postulates
and principles of sequence formulated in confor­
mity with the set of general postulates and
principles of sequence. The set serving the
policy of grouping -- organizing, or associative --
is to be interpreted...
is to be adopted.

(3) A coherent set of rules are to be formulated for the choice of terms-of-approach for generating associative classifications, and for rendering recording, and arrangement of subject-propositions for organizing classifications, and associative classifications.

The deep structure presented schematically in Section G2 may be regarded as the source-structure to design a new SIL for implementing a specific policy or pattern of grouping. POFSI, discussed in a later chapter, is an example of such a new design. At the same time, the source-structure can explain the surface structures of the different SILs for precoordinate indexing in one or more of the following terms:

(1) Decisions about the Base and the Core.
(2) Rules for eliminating redundant categories, and manifestations.
(3) Rules for analyzing categories.
(4) Rules for merging categories.
(5) Rules to ensure compromising economy.
(6) Decision about the style of presentation of subject propositions.
(7) Decision about terms-of-approach.
(8) Rules for reversing the basic sequence.
A glimpse of such surface structures have been furnished in Category 3 of Section G3.

The degree of "generality" of a theory can be measured in terms of the following:

1. Its capability of explaining the existing practices; and
2. Its capability of serving as a source for deriving new consistent practices to meet new demands.

From these two points-of-view, the General Theory of SIL presented in the earlier chapters has a claim for an adequate degree of "generality". It may be noted here that the examples of different surface structures furnished as "logical interpretations" of the "abstracted logical form" of SIL do not claim that their designers have followed the structure uniformly in their respective whole schemes. For example, in case of Dewey's SIL, the surface structure is readily discernable in his schemes for biological sciences; on the other hand it is not so readily revealing in his schemes for social sciences. So far as the SILs of Cutter, Kaiser, and Ranganathan are concerned, they may be said to have followed their structures more or less uniformly in their respective whole schemes. The purpose behind

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the logical abstraction, and logical interpretation of the deep structure of SIL has been to search for logical forms in the landmarks in the field of SILs. There has been no intention in this study to turn the focus on a criticism of these outstanding contributions in the field of SILs.