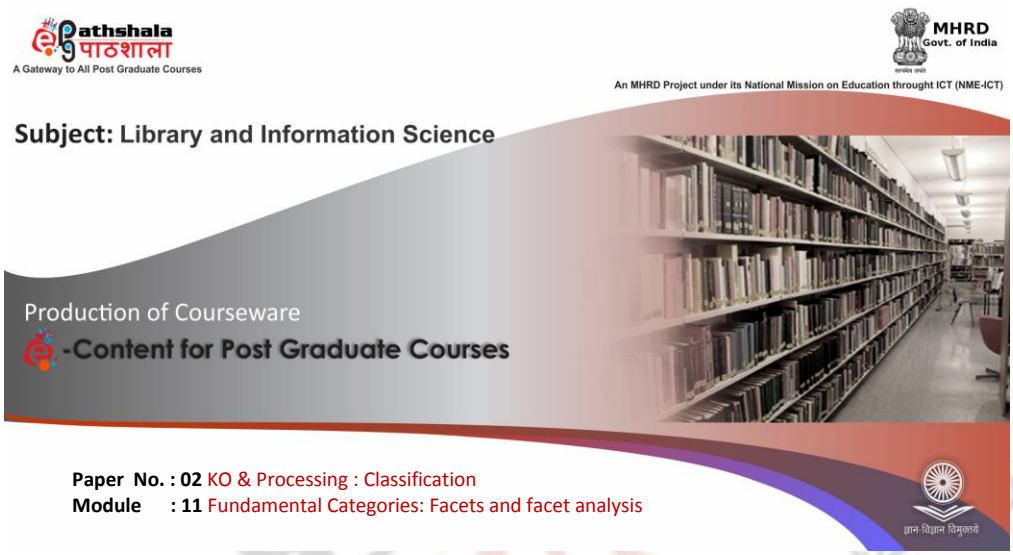

Paper No. : 02 KO & Processing : Classification
Module : 11 Fundamental Categories: Facets and facet analysis

Development Team

Principal Investigator & Subject Coordinator	Dr. Jagdish Arora, Director INFLIBNET Centre, Gandhinagar
Paper Coordinator	Dr. MP Satija Professor, Guru Nanak Dev University, Amritsar
Content Writer	Dr. MP Satija Professor, Guru Nanak Dev University, Amritsar
Content Reviewer	Prof. S.Ravi Professor and Head, DDE - Library and Information Science Wing Annamalai University

Description of Module	
Subject Name	Library and Information Science
Paper Name	02 KO & Processing : Classification
Module Name/Title	Fundamental Categories: Facets and facet analysis
Module Id	**LIS/KOP-C/11**
Pre-requisites	Understanding of the process of making abstract groups of entities.
Objectives	To have an acquaintance with the categorization of concepts and entities into a few basic and seminal patterns.
Keywords	Categories, facets, Facet Analysis. Fundamental categories, Logic.

Structure:

1. Categories: Meaning and Definition
1.1. Beginning with Aristotle
1.2. J. Kaiser : the Pioneer of Subject Categories
2. Categories in Bibliographic Classification
3. Work of Ranganthan
3.1. How he formulated the FFCs
3.2. Debt to Aristotle
3.3. Problem of Defining Categories:
4. Identification of Categories
4.1. Relations among categories
4.2. Time
4.3. Space
4.4. Energy
4.4.1. Manifestations of [E]
4.5. Matter
4.5.1. Manifestations of [M]
4.6. Personality
4.6.1. Manifestations of [P]
4.6.2. Residual Method
4.7. A Practical Example
4.8. Value of his Work
5. Post-Ranganthan Developments:
5.1. The DDC and the Categories
5.2. Debate on the Number of Categories
5.3. Summing up
5.4. Ploy of Rounds and Levels.
5.5. These are postulates only:
6. Summary
7. Glossary
8. References and Further readings
9. Test questions

Categories:Meaning and Definition

Dictionary meaning of the term c*ategory*is a kind of entity, or a group of entities having some similarity among them. Philosophically, a category is an attribute, property, quality, or characteristic that can be predicated of a thing. "(Wikipedia).The idea of categories in epistemology is as old as Aristotle (384-322 BC). The *Categories* (Greek Κατηγορίαι *Katēgoriai*; Latin*Categoriae*) is from *Organon*writtenby Greek philosopher Aristotle (384-322B.C.).It enumerates all the possible kinds of things that can be the subject or the predicate of a proposition. The *Categories* places every object of human apprehension under one of ten categories. Aristotle intended them to be anything that can be either the subject or the predicate of a proposition.

Beginning with Aristotle

Aristotle had claimed that the following ten predicates or categories could be asserted of anything in general:

Substance (man, dog, stone, gold, timber, house, etc.)
Quantity (large, two feet long, etc.)
Quality(blue,loud,good)
Relation (double, heavier, larger, slave, loudest, etc.)
Place (here, at school, Greece, etc.)
Time (yesterday, 2014, etc.)
Situation (horizontal, upside down, sitting, standing, etc.)
State (fever, clothed, shod, healthy, etc.)
Action (active verbs, running, reading, cutting, etc.)
Passion (passive verbs,affection,defeat, being cut, etc.)

Some commentators have argued that his distinctions were really linguistic. Aristotle's categories seem relevant since they refer to the elements of statements. The primary category is substance, which means individual things that exist, or members of classes in terms of traditional logic. Secondary substances are the species and genera to which individuals belong.However, Aristotle himself thought that he was referring to the nature of reality.

In philosophyof Immanuel Kant(1724-1804), a category is a pure concept of the understanding. A Kantian category is a characteristic of the appearance of any object in general, before it has been experienced. Kant wrote that "They are concepts of an object in general".Kant's categories refer to whole statements and do not appear to have much relevance to library needs. In subject analysis we are not making

statements but phrases.In library classification Aristotle seems to have more influence than Kant.

J. O. Kaiser : the Pioneer of Subject Categories

From here we can jump straight to 20th century.An early simple example is the practice of J. Kaiser in alphabetical indexing for an industrial firm. For this purpose he found that the most helpful distinction was between the categories of concretes and processes, as in the subject spraying (process) of paint (concrete). This is clear enough but obviously limited in the number of subjects to which it applies. Nevertheless his categorization became aspringboard for future research and sophistication in subject indexing.

Categories in Bibliographic Classification

Use of Categories for grouping of terms has become essential to organize knowledge into a coherent structure.Facet analysis is a tool for organization of information.From the beginning of the 20thcentury categories were more generally used in development of the UDC. However, their use was unsystematic and piecemeal. The DDC in its early life worked with two common categories of place and time, though the concept of categories was alien to it until veryrecently. The UDC is credited by many to be the first faceted classification, howsoever primitive, yet its facets never correspond to categories in the real sense.

Work of S.R. Ranganathan

This work was left to S R Ranganthan (1892-1972) “Ranganathan was the first to make full use of a clearly defined set of categories that were also the most generalized ever proposed for bibliographic purposes”, writes D. W. Langridge.Ranganathan slowly developed from 1928 to 1952 the concept of Five Fundamental Categories (FFC) of knowledge. Full development of categories has been seen since the 4thedition (1952) of the CC. His concept of fundamental categories is comparable to any great theory of the order of what Thomas S Kuhn (1922-1996) calls paradigms. The basis of the fundamental categories concept seems to be the recurring symmetry in the whole body of knowledge which in turn is transmitted to the coherent fragments called the main classes. It is a postulate that every idea, every subject is manifestation of one or more (at the most five) categories. It has been postulated by Ranganathan that in the universe of knowledge there are Five and only Five Fundamental Categories--Personality, Matter, Energy, Space and Time. It means that in the CC the recurrence of

the fundamental categories is exactly in the manner a chemist recognizes every kind of matter, in any form, is constituent of any or some of the 104 basic chemical elements.

How he formulated the FFCs

At the empirical level we encounter millions of concepts, facets, and subjects. We can easily divide them in a few groups having some common pattern. But these are not seminal categories. A workable method of further abstraction is to descend from the phenomenal level to their roots to reduce them to a few categories falling into a few patterns irrespective of their subjects. Descending to the seminal level is a work of intuition.Ranganthan writes:"One experience is to descend down and down, and down and down, and allow the millions of isolate ideas to get absorbed and assembled, re-absorbed, and re-assembled, and so on, until we find a few manageable seminal patterns." To sum up, by studying deeply the kindof facets to be found in different subjects he would see intuitively that at the seminal level they are manifested in five large fundamental groups. Name them whatever you want. According toD.J.Foskett, categories are clear cut, homogenous, mutually exclusive and exhaustive of their universe.Categories are "ultimate generic or seminal ideas at the bottom of all the patterns"

Debt to Aristotle

Langridgefeelsthat "Ranganathan seems to derive from Aristotle's idea of substance, buthe does not mention any debt to Aristotle… It is easy enough to see how the five of one relate to the ten of the other." The difference is due to different aims.

Problem of Defining Categories:

Formulation of categories is the first step then it is to define them objectively.These fundamental categories are not asdifficult to be identified as it is to formally define them.Categories tend to evade all definitions.It is alleged with some reason by many that Ranganthan has not defined his categories objectively. We know what theymean: but cannot tell what they are. A paradox. It is due tolack of experience. For example, the category Personality occursin all the main classes, but to say with certainty that it is suchand such is very difficult, indeed. It is hard to define, admits Ranganthan. Onlylong work experience helpsto recognise the categories. Flair based on experience may alsohelp. Nevertheless, they are best defined by enumeration. Their formulation was intuitive. Therefore, if somethingpuzzles us, the only answer seems that either we should acquireRanganathan'sintuitive insight, or acquiesce the wayRanganathan did it.

Since the term 'category' has become vague by common usage Ranganathan underlines the significance of his set of categories by calling them "Fundamental Categories". Ranganthan has very cleverly defended their enigmatic nature. To quote him:"I have denoted these postulated fundamental ideas by the term 'Fundamental Categories'. By going to a dictionary, finding out the meaning of each of the two component terms, 'Fundamental' and 'Category' and then combining the meanings, we cannot know what the "Fundamental Categories" are. The word-group forming the term 'Fundamental Categories' is an unbreakable one. It is defined by enumeration only" (*Prolegomena* Sec.RA81, p.398). But the compound term fundamental-categories still remains undefined. In other words it may also mean fundamental categories are PMEST and vice-versa.

Identification of Categories

They have no philosophical significance. These terms are used scientifically, and their practical nature is explicit. In any particular context these categories can manifest themselves in a variety of specific ways in each main class. Of the fivefundamental categories, the last two, viz., Space and Time are recurring, so they are the common categories for all the main classes. They remainthe same whatsoever may be the subject, therefore, have beenenumerated once for all in the CC.

Relations among categories

The sequence PMEST is in the decreasing order ofconcreteness: [P] is the most concrete and least abstract; [T] isthe most abstract and least concrete. But paradoxically the [P],though most concrete, is relatively difficult to identify. Onthe other hand [T] though most abstract is the most easy tobe identified in a given subject. Therefore, in practicalclassification we start by picking the [T] and come down to [P] viaSEM in subject analysis.

Time

Obviously it is the chronological aspectin a subject. 21st century poetry, medieval science, economic progress in thelast decade, or the 2014 Parliament elections, ALA winter conference, all these subjectsinvolve the time facet. In the CC the provision is to representtime up to a particular year, for example, "Political Events in2010". But we cannot indicate a particular month or day.Seasonal and diurnal times such as winter, snow, day, and night can bedenoted. Thus the provisions to indicate time very precisely,are more than that of in the DDC, though in comparison toUDC they are quite less. In the prescribed sequence of categories timecomes last, being the most abstract

of all the categories(certainly we cannot catch it nor touch it). In the facet formulait is represented as [T] and in the class number it is indicatedby an inverted comma. Here are some examples to illustratethe kind and use of time category.

Travelling in Snow Times

History of India in 100 BC

Indian Struggle for Freedom (1857 to 1947)

Future of Tertiary Education in India

Snow times,100B.C.,1857/1947 and Future all refer to the category Time.

Space

Any division of earth such as physiographical, directionalorientation, political and administrative units, or populationclusters are manifestations of the space category. World, Asia,India, Punjab, Amritsar, Middle East countries, South Asia,Nordic countries, French empire, UN Member countries, Arab League, G-8, SAARC,BRICS,Developing countries,Muslimcountries, English speaking world, Hills,Mountains, Valleys, Deserts, Forests, Water bodies, all are examplesof the Space category in the CC, It occurs mostly in socialsciences. In the facet formula it is indicated as [S]. In the classnumber it is indicated by a dot, "."In the PMEST sequence itcomes after energy. It means that it is less concrete than energy,but more concrete than time.

Energy

Next to Personality, it is the most important facet--asimportant that from its indicator digit Colon ":" the schemedraws its name, the Colon Classification. In the facet formulait is represented as [E]. In order of concreteness it lies halfwayof all the five categories. It means it is as concrete as it isabstract. As compared to Space and Time categories energyposes some difficulties in identification or detection. Thereseems no single term which may comprehensively define thecategory Energy as it exists under various main classes.However, broadly we can say that it is the manifestation ofactions, reactions, problems, solutions, processes andoperations. Linguistically speaking, verb takes the form ofenergy in the CC.

Manifestations of [E]

In Library Science, energy manifests itself in the technicalprocessing of documents and other library operations and activities; inMathematics, it is solution to theorems; in Chemistry it is thechemical manipulation, and in Technology it is the industrialprocess. In Life Sciences, energy wears the vesture ofmorphology, anatomy, physiology, diseases, their diagnosis cureand prevention. In Linguistics, it is the philological

problem suchas grammar, phonetics and composition. In Psychology it takesthe form of cognitive processes, feelings,psychometry. In Educationit is characterized by curriculum, teaching techniques, assessingstudents ability, and educational management. In politicalscience and History it is functions, powers and policy of thestate. In Economics, it is trade, transport, consumption,production, management and labour problems. In Sociologyenergy takes the form of social institutions, civilization, culture,social pathology and welfare:

Matter

As the name suggests it is the material facet, somethingless concrete than Personality but more concrete than Energy,Space and Time. It lends itself as a medium to be acted upon(kind of surface in Paintings: material in sculpture or building construction): or acommodity for consumption (wine in metabolism). It issomething passive on which energy facet acts.In the facet formula it is represented as [M], and in the class number it is indicated by a semicolon ";"

Manifestations of [M]

In Library Science matter is akind of document, whetherbooks, periodicals, manuscripts, microforms or a CD. Inphysiology, it is the substance which goes into the body; innitrogen metabolism, nitrogen is the matter --something beingconsumed. In Textile it is the thread material. In Music it is thekind of musical instrument. In money (Economics) it is thepaper or the kind of metal--the medium of currency.

In most of the subjects in the CC-6 this category remains absent.

Personality

Of all the five categories Personality is the most concreteandyet most difficult to recognize and describe. Like human personality it is anelusive something. Ranganathan describes it ineffable. It imparts a distinct personality to the subject.It bestows an identity upon the subject. Without it a subjectmay be formless—without a face. It is wholeness of a topic. Let us consider the subjects:

Atomic Weight

Atomic Weight of Gold

Constitution

Indian Constitution

The subjects 2 and 4 are more distinct and identityholders than the subjects 1 and 3 respectively.

Manifestations of [P]

Personalityincarnates itself in persons (individual or groups), institutions,entities and their parts, substances, chemicals, kind of life or plant, bodyorgans, nations, languages, religions and the like. In Library Science,the various kinds of libraries constitute the personality; inChemistry the chemical substance, in life sciences the kind oflife, in Agriculture, the agricultural produce, in Medicine thebody organs and in Fine Arts, the style (what else can givepersonality to an art) constitute personality. Language is thepersonality in linguistics and literature. In Psychology andeducation individuals form the personality; while in sociology,history and law, human groups constitute personality.

Residual Method

Since the personality facet in a subject is difficult to recognize, therefore, Ranganathan has prescribed theResidual Method for its identification. A simple logic workshere. It consists in eliminating one by one all the other easilyrecognizable categories, starting from the identification of Timefacet. Since the number of categories never exceeds five, so ifthe other four categories have been identified, then obviouslythe remainder one will be the Personality. Chemists usuallyemploy this method of elimination in laboratories forsalt analysis. The remaining category, which Ranganathan called personality, is the one that has been most difficult for many people to understand or accept. Ranganathan himself was at least partly responsible for making it look difficult by describing this category as ineffable and proposing a negative method for its identification. M.A. Gopinath, a close associate of Ranganathan, later claimed that the [P] can be identified directly in a subject without resorting to the residual method.

A Practical Example

To illustrate, let us take a title “Cataloguing of Periodicalsin University Libraries”. In this compound subject, whose main class is 2Library Science, we can see at the outset that the Time andSpace categories are absent. Energy is cataloguing(being some action) and theperiodical (being the kind of document) is the Matter facet. Nowwhat is left in the residue, i.e., University library, must be thePersonality. In the facet formula, it is represented as [P] and inthe class numbers it is indicated by a comma “,". There arealso cases where personality facet does not require any indicatordigit in the mechanics of the facet formula.

Value of his Work

Their value has been further confirmed by the experience of the Classification Research Group. They began by accepting Ranganathan’s ideas in general principle but refused

slavishly to be bound by his system in detail. Ironically, they ended up using the same five categories for research in general classification, three of them under the more objective terms of Entity, Property and Activity in the PRECIS, a subject indexing system for the BNB developed by Derek Austin (1921-2001). These have been recognized as the major categories, even when a more extended set has been used.

Post-Ranganthan Developments:

The discussion of categories in bibliographic (or library) classification came only after the introduction of the idea by Ranganathan and later by other faceteers (like the CRG) and faceted schemes of classification for special libraries on Ranganathan's pattern. Many librarians, such as B.C. Vickery, D.J. Foskett, J. Mills, D.W. Langridge and other CRG members, have constructed many faceted special subject schemes on the assumption of varying number of categories. Indeed these are facets in terms of Ranganthan.They extendedcategories to the following and never asserted them to be called categories, far from being fundamental. Their categories in order are:Thing-Kind-Part-Material-Property-Process-Operation-Agent.

Formation of these categorieswas the distillation of British experience with special subjects during the 1950s. From the 1960s the Classification Research Group (CRG, London established in 1952) turned its attention to the problems of general classification, and the outstanding product of this attention has been the ingenious work of Jack Mills(1918-2010) as a member of the CRG in total revision of the internal structure and detail of the Bliss Bibliographic Classification. He was assisted by Vanda Broughton. A full account of the categories and their use is to be found in the Introduction to the BC-2 scheme, 1977-.It has elucidated categories to thirteen numbers:Thing-Kind-Part-Property-Material-Process-Operation-Patient-Product-Byproduct-Agent-Place-Time. These facets and theircitation order represents a high degree of generality, but the names of the categories reflect their derivation from the study of empirical subjects: their validity in technology is more obvious. Despite this, they have been found to have wide application in the construction of BC2.Ranganathan would easily reduce all these facets to his five fundamental categories in rounds and levels

5.1. The DDC and the Categories

DDC being a hierarchical scheme does not recognize categories as such though Timeand Geographical areas have been used as common tables for synthesis of numbers for quite a long time. Now it has of late realized that there is no escape

from categories. In choice or precedence of facets it now prescribes standard citation order of categories: Things and their Kinds, Parts, Materials, Properties, Processes, Operations, Agents, Place, and Time

5.2. Debate on the Number of Categories

Ranganthan writes,"One may ask 'Why should the Fundamental Ideas postulated be five? Why not 3? Why not 6?' It is possible. There is absolute freedom for everybody to try it out. A person may be fond of six. He must classify on that basis some thousands of assorted articles. If they produce satisfactory results in arranging the subjects of the articles along a line, that postulate may be accepted. This is not a matter to be argued out *ex cathedra* without such a thorough and prolonged try-out. Working on the basis of five fundamental ideas has produced satisfactory results during the last six decades. Even while keeping to the number five, the ideas postulated may be different. This is also possible. The hypothesis of Five Fundamental Categories (FFC) is only a working assumption.His sole justification for the five is that they have worked in practice

5.3. Summing up

Notwithstanding his justification the number of categories has been challenged. It is vulnerable, no doubt.The number depends on how you define a category. Ranganthan seems to have a fascination with the number five(recall his Five laws). Indeed the number five has a great significancein Indian mythology and culture. For him this number seems sacrosanct which he does seem to change despite evidence to the contrary. Though he himself admits the number is neither natural or absolute-- only an assumption, postulate that works. To this it can be said any number could have worked--Kaiser did with two, CRG did with ten and now BC-2 is doing well with thirteen. In his spiritual moments he thinks that this number can even be reduced to One. The postulate of FFCs is a mould in the CC where everything has to be forced in. Classifcationistsdesigning new classifications especially for specialized narrow subjects have difficulty in analyzing the subject into FFCs.Since Space and Time being not central to most subjects, it may appear that three categories are somewhat inadequate for dealing with the majority of knowledge (It is only one category more than Kaiser's). Micro subjects require far more than three concepts to express their subject matter.

5.4. Ploy of Rounds and Levels.

Any concept referring to a phenomenon can be allocated to one of the five categories. Categories being deep and nebulous manifest themselves in facet – these cannot be

seen directly. That is why Ranganathan prescribes facet formula for each main class.Though thecategories are five but facets within them can be numerous. A lady who had obsession with her age to be of 22 years when asked about her age she replied 22 years and a few months. When further asked how many months then she said hundred twenty months. So iswith five categories and their facets. Though Ranganthan has given a mechanical formula for formation of mazy rounds and levels and their sequence using the principles of facet sequence, but has never made clear the substance of facets going with say second or third round, except that [S] and [T] categories are to be placed in the last round.What constitutes levels within a round has never been explained. In fact the concept of rounds and levels has made the facet formula mazy instead of keeping them in a linear mode of many facets succeeding logically one after the other. Recent splitting of the FC [M] into three categories of matter–property, matter–method and matter –material has taken away even the crispiness of the five categories. If these are fundamental how then these can be further broken --they no more remain fundamental.Something which is fundamental is immutable so cannot impersonate as something else as Space and time often masquerade as personality. Anyhow, it is admitted that so far only he has given the least number of categories in library classification.

5.5. These are postulates only:

Of these seminal ideas, nothing can be asserted about their being true or false. If they prove helpful, we have just to postulate them and work with them. The terms we use to denote them should be taken only as assumed terms and not as fully defined terms. We should start in this way. On the other hand, if we say, “We shall first settle fully what these five ideas are and then only start working”, we may not at all start working. Therefore, we start with something about which we vaguely agree. We go forward. As we go on classifying with their help, this or that may become clearer and even be modified if necessary. This is how postulational classification begins. Here Ranganthan is very rational and open. But despite more than six decades of their clear formulation and work by the CRG the Indian school has never moved further to assimilate the research in Europe and elsewhere in the US. There is a need to relookat the postulate of FFCs to reconcile with the latest developments.

Summary

A category literally means kind or type. In philosophy, the term goes back to Aristotle (384-322 B.C.) who divided the entire phenomena into 10 categories. Since then many

philosophers like I. Kant have tried to sum up or abstract all phenomena into a few categories. In library science, we begin with J.O. Kaiser who in 1911 divided all the concepts into two categories of concrete and process. He was concerned with indexing than with systematic classification. Despite their inadvertent use in the DDC, the clear credit to fully develop and employ categories in subject analysis goes to S.R. Ranganathan (1892-1972). Though he brought a revolution in theory and practice with his faceted classification published in 1933 but assimilation of various facets took slowly from 1928-1952. In 1952, he formulated his postulates of Five and only Five Categories in the universe of knowledge depicted by the acronym PMEST. The concept clicked especially with its British disciples who founded the CRG, London in 1952 and designed many special subject classifications based on facet analysis. But they didn't subscribe to the postulate of five fundamental categories. They elaborated the five to almost ten and worked successfully. One of their outstanding memberJ.Mills (1918-2010) who revised rather overhauled the Bibliographic Classification (BC, 1944-1953) by H.E. Bliss (1870-1955) elaborated them to thirteen:Thing-Kind-Part-Property-Material-Process-Operation-Patient-Product-Byproduct-Agent-Place-Time. The Mills' BC-2 which is being published in parts since 1977 is considered a very technically sound and up to date library classification based on facet analysis. There has always been a debate on the number of categories. Though Ranganathan wants to prove by all means that the postulate of five categories is working well. On the other hand (with a tongue and cheek) he declares to be open to any number. It seems that in the present age of micro subjects the mould of five categories is small to accommodate all the facets in subject analysis. The concept of Rounds and Levels is a backdoor admission of more categories than five. Splitting of the matter category into three kinds of Matter-Property, Matter-Method and Matter-Material is a severe blow to the number five. It is time the Indian school takes cognisance of the research in categories done in Europe and North America.

Glossary

Abstract entity: An intangible conceptual object which cannot be perceived by any of the sense organs. An abstract entity resides in the mind, and outside the mind it has only manifestations. Examples are love, bravery, honesty. In J. Kaiser's terms it is a process or action.

Category: A category is very broad and general division of the universe into homogenous groups at the seminal level.A concept of high generality and wide

applications which can be used to group other entities or concepts.Categories are "ultimate generic or seminal ideas at the bottom of all the patterns"

Concrete: An object or phenomena which can be perceived by any of the sense organs, e.g. Table, music, pungent odour, sour, soft. It corresponds to thing or entity in Kaiser's terms.

Facet: A subgroup of equally ranked entities obtained by the applications of single characteristics to agroup.A facet is mostly taken synonyms with category in the Western literature. However, on the Ranganathan's CC the facets occur with a category. In Literature there are four facets, namely, Language, Form Author and Work of the Personality Category.

Facet analysis: The process of breaking a subject into its constituent topics and assigning each concept to any of the pre-determined category. Another name for subject analysis.

Phenomena: Any existence, abstract or concrete, in the universe; a fact or event in nature or society. It is any observable occurrence.In scientific usage, a phenomenon is any event that is observable, however common it might be, even if it requires the use of instrumentation to observe, record, or compile data concerning it.

PMEST: A famous acronym for Ranganathan five fundamental categoriesshowing their order and intra relations in the specific to general order.

Subject analysis: See Facet Analysis.

References and Further readings

Foskett, A.C.1996.*The Subject Approach to Information,* 5th ed.London: LA Publishing, pp.316-318

Foskett, D.J. 1974. *Classification and Indexing in Social Sciences*, 2nd ed. London: Butterworths, pp.117-120

Grolier, Eric de.1962.*Study of General Categories Applicable to Classification and Coding in Documentation*. Paris: Unesco.

Kaiser, J. O. 1911. *Systematic Indexing.*London:Pitman.

Krishan Kumar. 2004. *The Theory of Classification*. New Delhi: Vikas, pp. 260-272.

Langridge, D. W.1989. *Subject Analysis: Principles and Procedures*. London:Bowker-Saur, pp.37-44

Maltby, A.1975.*Sayers' Manual of Classification for Librarians*, 5th ed. London: Andre Deutsch, pp.192-196.

Meadows,A.J.1991.*Knowledge and Communication: Essays on the Information Chain*. London: Library Asssocation,pp.14-15
Mills, J. 1962. *A Modern Outline ofLibrary Classification*. Bombay: Asia, pp. 24-25.
Moss, R. 1964."Categories and relations" *American Documentation*. October, pp.296-301
Ranganathan, S.R. 1967.*Prolegomena to Library Classification*, 3rd ed. Bombay, Asia, pp.395-411.
Roberts,N.1969. "An examination of the personality conceptand its relevance to the Colon Classification scheme" *Jl. of Librarianship,* July: 131-148
Satija, M.P. 2004.*A Dictionary of Knowledge Organization*. Amritsar: Guru Nanak Dev University, 248 p.
Satija, M.P. 2011.*A Guide to the Theory and Practice of Colon Classification*, 5thed. New Delhi: EssEss, pp. 64-72.
Srivastava, A.P.1992. *Theory of Knowledge Classification for Librarians,*2nd ed./assisted by M P Satija,*et.al*.New Delhi: The Learning Laboratory,pp.18-28.
Vickery, B.C. 1960. *Faceted Classification: A Guide to the Making and Use of Special Schemes*. London: Aslib. 70p
Vickery, B.C. 1975*Classification and Indexing in Sciences*, 3rd ed. London: Butterworths,pp.193-209
Wikipedia:http://en.wikipedia.org/wiki/