The Colon Classification: A few considerations on its future

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The article highlights the efforts and plans of Sarada Ranganathan Endowment for Library Science for revival of CC. Presents a brief history of the Scheme and explains is features. Discusses areas needing revamping for continual revision and existence of CC. Also seeks feedback from LIS professionals on the revision of the Scheme.

Keywords: Colon Classification; Isolate ideas

Introduction

Among the several seminal contributions of Dr. S. R. Ranganathan, *Colon Classification*, first published in 1933, and the *Prolegomena* stand out. The origins of the Colon Classification scheme lay in Ranganathan's dissatisfaction with the library classification schemes of the times when he was a student at the University of London. Ranganathan found that the structure of Dewey Decimal Classification was not flexible enough for expansion and for accommodating new developments in the universe of ideas / subjects. He hit upon the idea of structuring subjects *'bottom-up'* within each Basic subject (Main class) and came out with the idea of *facets* and built a scheme based on the notions of *facets* and *facet analysis.* The scheme which came to be known as *Colon Classification* (CC), because that was the only indicator digit that Ranganathan employed in the first three editions of the scheme, revolutionized the approach to design of library classification schemes. CC was the first general classification scheme to be designed explicitly on the basis of Ranganathan's idea of Facet Analysis. Of course some of the principles and techniques had been employed in the U.D.C and to a limited extent even in the Dewey Decimal Classification (DDC); but it was CC that heralded the beginning of a new line of thinking and became a turning point in the history and development of schemes of classification.

Quite early in the development of CC Ranganathan had realized the importance of a comprehensive general theory of classification as the basis for design, development and comparative studies of classification schemes. He came out with his *Prolegomena to Library Classification* in 1937; a second edition of Prolegomena was published in 1957 which was hailed by Berwick Sayers as the "most precise, theoretical, practical and comparative exposition of classification theory …. intensely original".[1] A third edition of *Prolegomena* has also been published. The development of CC has been based on the theory expounded in the *Prolegomena*.

Editions of CC

During the life time of Ranganathan, CC saw six editions, a rate of revision matched by no other general classification scheme except Dewey Decimal Classification (DDC). The 6th edition of the scheme was the last one to be published when Ranganathan was alive. Ranganathan also published a preview of the proposed 7th edition in 1969[2]; but sadly Ranganathan passed away in 1972 before the 7th edition of CC could be published. The work of revision of the scheme was undertaken by Ranganathan's associates in the Sarada Ranganathan Endowment for Library Science (SRELS) and a revised edition (7th edition) was brought out in 1987[3]. Unfortunately this was not a complete edition as it had no index. There were also several imbalances in the edition and the user community of *Colon Classification* in India found it extremely difficult to implement this edition. Also since the edition was incomplete, LIS schools continued to teach the 6th edition, a practice which has continued till day. A volume to serve the purpose of demonstrating the use and application of this edition containing a large number of worked out examples was also brought out subsequently by SRELS.[4] Table 1 gives a broad idea of the different editions of CC.

Table 1—Editions of CC

Edition No.	Year	Some Features
Edition 1	1933	The first library classification scheme to be designed on the basis of facet analysis
Edition 2	1939	The first edition to be published after Ranganathan had published the *Prolegomena* outlining his General Theory of Classification; A new main Class "Spiritual Experience and Mysticism" was introduced
Edition 3	1950	
Edition 4	1952	The notion of Five Fundamental Categories was introduced
Edition 5	1957	
Edition 6	1960	
Edition 6 (revised)	1963	A reprint of the sixth edition with corrections and amendments in the form of an 'annexure'.
Edition 7	1987	A vastly expanded schedule of Basic subjects; Only Volume 1 has been published; incomplete edition as it had no index
Edition 7 (revised)	2010	"Dvibindu Vargikarana": A revised bilingual (Kannada-English) version of CC

The different editions of CC could broadly be grouped into three versions[5]. A rough classification of the different editions of CC into these three versions would be:

➢ Rigidly Faceted versions (editions 1, 2 and 3)
➢ Analytico-Synthetic versions (editions 4, 5 & 6)
➢ Freely Faceted versions (edition 7 onwards)

This evolution primarily reflects the developments in the theoretical basis of the scheme and its notation which had been evolving continuously since the publication of the first edition of *Prolegomena*.

CC and, even more so, Ranganathan's ideas of facet analysis and faceted classification have influenced and impacted much of subsequent thinking on classification in the 20th Century. The major general classification schemes of the western world including DDC, *the Universal Decimal Classification* (UDC), FID's BSO, *the Bibliographic Classification* Ed.2 and all the special classification systems developed by members of the British Classification Research Group have been influenced by CC. In fact in 1955 the British Classification Research Group went to the extent of publishing a paper entitled 'Faceted classification as the basis of all information retrieval', which came to be regarded as the manifesto of the Group[6]. Today the technique is widely employed in such areas as information architecture, design of search engines, thesauri and ontologies, to mention a few. It is no exaggeration to say that CC has been a trend setter. To have an idea of the impact and influence of Ranganathan and his *Colon Classification* on thinking in the area of Knowledge Organization in general and on the other classification schemes in particular, one has

only to examine the proceedings of the biennial International Conferences of the International Society for Knowledge Organization (ISKO) published by M/s Ergon Verlag of Germany. To date 14 Volumes have been published by M/s Ergon Verlag in the series, *Advances in Knowledge Organization*; the last volume was published in 2014.

Some features of CC

Before going into a discussion of the major principles of revision of the scheme, it is important to emphasize a few things particularly about the structure and purpose of CC.

CC was designed as, and remains, a library classification scheme. It was also designed as a general classification scheme covering all branches of knowledge. It was Ranganathan's idea that a general classification scheme should be the basis for more detailed depth versions / fascicules for classification of micro-subjects in specialized libraries or specialized bibliographic tools[*]. Although initially the members of CRG differed from Ranganathan on this and went about building several independent special classification schemes, CRG also did a substantial amount of research on a new general classification scheme including examining the *Theory of Integrative Levels* as the basis for such a new scheme. The subsequent work of FID in developing the Broad System of Ordering (BSO, which, in its planning stage was called as Subject-Field Reference Code (SRC)) also emphasizes the importance of a general classification scheme. That renewed attention has come to be paid in recent years to the work of S.R. Ranganathan, his predecessors and his followers is evident. Kuronen[7] writes:

The Colon Classification has not become as popular as it might have deserved. It is possible that the global networking, the evolution of virtual libraries, makes researchers of library and information science look for new methods in organizing documents and subjects for networking purposes. We even think that the theory of facet analysis implies ideas which are still to be explored and to be fully utilised in the electronic environment. Ranganathan developed his CC faceted classification 'too early'; the time is still to come to benefit from it as a structured domain language as used in AI (Artificial Intelligence) and expert systems with sophisticated graphic user interfaces.

Referring to faceted classifications, LaBarre writes: "Website designers became aware of the potential and interest of this particular classification".[8] There is no question that the principles and techniques developed by Ranganathan for use in CC are being employed for a wide range of purposes and this has only expanded in recent years. However, this is another issue. The focus in this paper is on CC as a library classification scheme and we will only make a few references to its potential in the digital environment.

To the extent that CC is a library classification scheme, it is similar to other general classification schemes such as DDC and UDC in its approach to classification. In other words CC, just as any other library classification scheme, begins by dividing the universe of subjects into an array of Basic Subjects (Main classes). However, it differs from the other schemes in several fundamental ways beyond this stage of dividing the universe of subjects into a set of Basic subjects. The scheme adopts the *bottom-up* approach within each Basic class to structure subjects and build their classification codes. In his preface to the very first edition of CC Ranganathan said: "the schedule in the *Colon classification* may be said to consist of certain standard unit schedules. The standard unit schedules correspond to the standard pieces in a Meccano apparatus".

Basic Subjects

Ranganathan's approach to Basic Subjects (Main Classes) has been, from the very beginning, different from those of DDC and UDC. Where as in DDC the number of main classes has been dictated by the limitations imposed by its notational base (This is also true to a certain extent of UDC), CC has had a very flexible approach. The different editions of CC have arrived at their schedules of Basic Subjects by

postulation considering literary warrant. Thus the number of Basic Subjects enumerated in the different editions of CC in the first order array of Basic Subjects has been growing to keep pace with the developments in the universe of subjects. Quite early in the development of his General Theory of Classification Ranganathan came out with the suggestion that Basic Subjects should be postulated depending on the need. The suggestion was that if there are adequate indications (in the form of literary warrant, graduate level educational programmes, journals, professional bodies exclusively devoted to the subject area, etc) that a subject area has matured, the subject area could be elevated and postulated as a Basic Subject (with its own appropriate schedule of special isolates (Concepts / ideas)). A rough idea of the growth of Basic Subjects in CC can be obtained from Table 2 (Figures in the table are old and may not be accurate; these are given only to provide an idea of the growth)

The growth of the schedule of Basic Subjects in CC from the first edition to the 7th edition is in accordance with this broad principle and approach. For example, the 2nd edition of CC (1939) had listed only 28 Main classes (if we consider *Generalia* as a single Main Class). In the Kannada-English bilingual version of CC (Published in 2010) the number of main classes has grown to over 120 (excluding Secondary Basic Subjects, Systems and Specials). Most small libraries – public, school and college libraries – should find the schedule of Basic Subjects adequate for shelf arrangement purposes of a good portion of their collections and will require more detailed classification only in respect of books falling within the traditional main classes. The position of each one of the new basic subjects has been logically determined keeping in mind the mode of formation of the subject and in accordance with the principles enunciated by Ranganathan resulting in a logical sequence of the Main classes. The sequence of Main Classes in CC has, since its inception, been closely parallel to that suggested later by members of CRG based on the application of the Theory of Integrative Levels. The broad order of Physical sciences followed by Life Sciences, followed by Humanities, followed

Table 2—Growth of basic subjects

Type of Basic Subject	CC Ed 6	CC Ed 7
Main Basic Subjects	33	108
Partial Comprehension	9	31
Subject Bundle (Agglomerate Basic Subject)	--	9
Non-Main Basic Subjects	347	575

by Social Sciences reflecting the different levels of integration has been the order from the very first edition of CC. However, there are deviations dictated by pragmatism; e.g., Ranganathan has adopted the principle of '*pure science*' followed by its 'application'. Thus Engineering follows Physics; Technology follows Chemistry; Mining follows Geology; Agriculture follows Botany; Animal Husbandry and Medicine follow Zoology; Social Work follows Sociology, etc. A guiding principle in notating Basic Classes in the revised bilingual edition which will be adopted in the revised editions of CC, has been to ensure that the length of the notation for any Basic subject does not normally exceed 3 digits.

Isolate ideas

The building of the schedules of concepts (special isolates) going with each one of the Basic Subjects in CC has always employed the '*bottom-up*' approach. The concepts / facets going with a Basic subject identified on the basis of examination of the literature on the subject are categorized according to the schema of *Fundamental Categories* enunciated by Ranganathan.

Ranganathan's five *Fundamental Categories* are *Personality* (P)*, Matter* (M), *Energy* (E), *Space* (S) and *Time* (T). Of these *Space* and *Time* figure in most classes; and concepts / facets that are manifestations of *Space* or *Time* are treated as *Common Isolates*, a practice that has been in use in most other classification schemes including *Dewey Decimal Classification* (almost since its inception). It is true that the notion of the *Five Fundamental Categories* in the first six editions of CC and the connotation of *Personality* have been subjects of much criticism. Norman Roberts wrote a very detailed paper on the *Personality* concept of Ranganathan[9]. However, what constitutes *Personality* is now fairly clear: *Personality* is the core entity of study of a discipline. A comparison of the schedules of special isolates in the different editions of CC clearly indicates the vast expansion that has taken place in the 7th edition of CC when compared with the 6th edition. This should not be surprising for two reasons:

➢ The first 6 editions of CC appeared in a short span of 27 years (the scheme was first published in 1933 and the 6th edition appeared in 1960); it took another 27 years for the 7th edition to appear (1987);

➢ There were substantial developments in the universe of concepts and universe of subjects

since the publication of the 6th edition in 1960 resulting in the emergence of a large number of new concepts, new disciplines, etc.

➢ The 7th edition also reflects many new features. For example:

➢ A vastly expanded schedule of Basic Subjects (to which reference has already been made):

➢ Re-definition of some *Fundamental Categories* resulting in many facets / concepts that were considered manifestation of *Energy* in the earlier edition(s) being grouped under *Matter Property*;

➢ Vast expansion of the schedules of *common facets* belonging to P, M and E categories:

There are also many imbalances in the 7th edition (1987). Just to mention a few:

➢ Some of the schedules are very detailed while some or not; (E.g., a very detailed schedule for *Mass Communication* as compared with a much smaller schedule for *Physics* which is difficult to justify given the rate of growth of Physics as a discipline;

➢ Only the first volume (The schedules) was published and the index to the schedule was not published even several years after the publication of the 7th edition;

➢ There are a large number of typographical errors present in the 1987 edition;

➢ The notation has become even more complex than in the earlier editions. There have also been many changes in the Notational Plane. We shall later refer to these.

The revision of CC

Recognizing its scientific approach, *CC* is being taught in many schools of library & information science although the emphasis may vary from school to school and country to country. In India there are a large number of libraries that continue to use the scheme. Some university libraries, a few special libraries, a large number of public libraries and even many college libraries are using the scheme. The *Indian National Bibliography* being compiled by the Central Reference Library, Kolkata (coming under the Department of Culture, Government of India) assigns Colon class numbers to every item listed in the bibliography – i.e. for all books received under the Delivery of Books & Newspapers (Public Libraries) Act. The lack of a complete revised edition of the scheme has been a major issue for many of these libraries. For want of a complete edition, many

schools of LIS in India continue to teach classification practice based on the 6th edition. Some have even discontinued teaching CC altogether.

The revision of any classification scheme is a massive and large scale exercise. General classification schemes such as the DDC, the Universal Decimal Classification and the Library of Congress Classification have strong institutional support and are able to bring out revised editions at regular intervals. The revision of these schemes has been a continuous process and the institutional support also enables these schemes to be continuously updated. The libraries which are using these schemes are regularly notified of changes and modifications through newsletters and other means. The institutional support for these schemes has ensured the availability of adequate number of trained staff devoted exclusively to the work of revision. The situation is very different in respect of India's own scheme, the CC. Satija mentions that there is no national committee or a substantive institutional backing responsible for the revision of the scheme.[10] The responsibility for revising the scheme remained essentially in the hands of S. R. Ranganathan for nearly four decades since the scheme was first published in 1933. After his passing away the revision of all of Ranganathan's works has been the responsibility of SRELS, a registered *not-for-profit* society that was founded by Ranganathan himself with the objective of furthering the cause of library science. There is no question that since the last complete English edition of CC was published there have been significant developments in all branches of knowledge; many new disciplines and a very large number of new concepts have emerged. There is an urgent need for a substantial revision of the scheme. Some developments have taken place towards realizing this objective. In 2007 the Central Institute of Indian Languages, Mysore funded a project to bring out a bilingual (Kannada-English) edition of CC based on the 7th incomplete edition that was published in 1987. This was a time-bound project and was completed in 2010. Given the very short time span, a comprehensive revision of the scheme was not possible; nevertheless a bilingual edition of CC as envisaged in the project was published in 2010.[11] In 2012 prior to the holding of the International Conference of ISKO in Mysore (Jointly organized by SRELS and the University of Mysore), a meeting was convened by A. Neelameghan, the then Member-Secretary of SRELS, to discuss the subject of revision of CC. A few major principles / guidelines were formulated which were to serve as the basis for the revision of CC and for bringing out a substantially revised edition of the scheme. These broad principles/ guidelines are explained below with the idea that there will be reaction and feedback from LIS professionals and more particularly the user libraries. The feedback and suggestions will be used as the basis for formulating a definitive strategy for the revision of the scheme.

Broad principles

Some of the broad principles being considered for adoption in the revision are:

- The incomplete 7th edition of CC published in 1987 and the bilingual Kannada-English version of CC published in 2010 by the Central Institute of Indian Languages (in association with SRELS) will be the basis for the revised edition of CC; In addition the recent editions of DDC and UDC will also be consulted to identify concepts that need to be accommodated in the revised edition;

- The revision should consider the need to remove the imbalances in the existing version – some schedules are very elaborate while some do not even include essential isolate ideas; In revising the schedules special attention will be on those schedules that have not been comprehensively revised since the publication of the 6th edition;

- The revision should recognize that a large number of concepts / ideas (especially *Matter Property* and *Energy* type ideas) going with different Basic Classes are equivalent at the near seminal level. The revision will therefore focus on developing more comprehensive schedules of Common *Property* and *Common Energy Isolates*; Thus *special isolates* in the schedules of different Basic Classes can largely be limited to *Personality* type ideas unique to the concerned Basic Classes;

- The *Colon Classification* scheme has been seen by many as a scheme with great potential for use in automated systems. However, there are problems with its complex notational system which was developed primarily as a scheme for logical arrangement of documents on the shelves of a library or their bibliographic records in bibliographic databases such card catalogues / bibliographies. The proposed revision is aimed at keeping this in mind and simplifying the notation of the scheme to a very large extent so as to make

it easy to implement and acceptable for a large number of user libraries in the country. It is recognized that the complex notation of CC has been a major obstacle in its adoption by libraries. In view of this it has been suggested that the scheme should permit broad classification that is adequate for shelf arrangement of books and other documents. We consciously recognize that very minute classification for the purposes of shelf arrangement is not only not necessary but also could be a major obstacle in retrieval. It has been suggested that the class number should not exceed 7 plus or minus 2 digits. As mentioned earlier, the schedule of Basic classes itself should be reasonably adequate for classification of a large proportion of document collection especially in small and medium-sized libraries.

• While revising the scheme the schedule of Basic subjects will be expanded to accommodate the disciplines that have emerged in the last 4 decades. The idea is that smaller libraries and even public libraries should be able to classify, notate and arrange a good proportion of their collection without having to go beyond the schedule of Basic Subjects.

• The revised classification scheme should be a rich source of terminology. Keeping this in mind a more comprehensive Index will be prepared. In other words the idea is that even if specific class / isolate numbers are not available for certain subjects / concepts, the index will be a comprehensive one including

➢ Terms of higher level of specificity (Even those that are not part of the schedule) with a link to the broader class code / isolate number; and

➢ Synonyms

References to some experiments based on the terminology of the bilingual edition have already been made.

• The revision should adequately reflect and map the universe of subjects and in a manner that is acceptable to most user institutions. For this purpose, the *Indian National Bibliography* and a few user libraries will be requested to test the revised schedules by way of applying the scheme to a test collection of a reasonable size. Extensive testing of the revised schedules of the scheme will also be carried out at the SRELS by way of applying the scheme for

classifying books available on Amazon.com and similar e-commerce sites. The testing will also be a continuous process and will be done separately for different disciplines as and when the revised schedules for the disciplines become available. Subject experts will be requested to examine the resulting sequence of subjects in each discipline for its helpfulness and logical order.

• CC unlike UDC has adopted a facet sequence right from the very first edition. The feature in UDC that allowed combination of facets in more than one sequence was seen by many as an advantage offering flexibility. In today's environment a standard facet sequence is probably more desirable than flexibility. This will continue to be the norm in revising the scheme and the facet sequence will continue to be guided by the Wall-Picture Principle and its derivatives.

In revising the schedule SRELS will continue to adopt the *bottom-up* approach as shown in the figure below:

The future

CC has been in existence for over eight decades now. As a scheme of library classification different editions of CC are still being used in a large number of libraries in India. Recent years have seen the application of the principles that were developed to serve as the theoretical base for CC, in such areas as information architecture, search engines, etc. CC began, unlike any other classification scheme, with a new and fundamentally different approach to the building of classification schemes. It has continued to
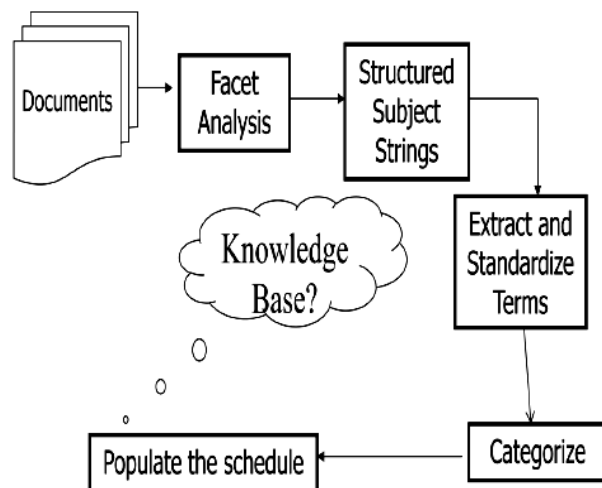

Fig. 1—The revision process

be a testing ground for many ideas and experiments many of which have been adopted by other schemes. Experiments aimed at using computers for synthesizing Colon class numbers were carried out even in the 1970s.[12] Reference has also been made to some other experiments involving CC that have been carried out in recent years. The 2010 bilingual edition of CC (about which mention has already been made) has been stored as a master file to make the task of revision involving insertion of new terms and replacing / relocating concepts easier. The Master file is also being used for some interesting experiments. Recently a pilot project to design and develop a multilingual thesaurus – with descriptors in English and eight other Indian languages –for 'Education' derived from the bilingual (English-Kannada) edition of CC was carried out.[13] There has also been a small-scale experiment in which CC was used as a *bridge* language to search a multilingual digital collection. The search term in a natural language was automatically translated into search terms in other languages (in which there were resources in the digital collection) using the schedule of CC as the *bridge*.[14] In other words the input search term was first translated into the CC number and from that to equivalent search terms in other languages. Some more experiments that will use specific schedules of CC as a source of terminology and, to a limited extent, as a source for defining relations between concepts, for developing thesauri and in developing ontologies are underway.

Conclusions

For CC to remain in active use as a classification scheme the most important and crucial thing is to bring out a comprehensive revised edition which is long overdue. CC is unlike any other classification scheme in that it is based on a theory of classification, viz., the General Theory of Classification developed by Ranganathan. There are some major issues that have affected the wide and continued use of CC as a library classification scheme:

- The lack of a strong institutional support for regular and continuous revision, and publication of revised editions of the scheme; No doubt SRELS was founded by Ranganathan for, among other things, the very purpose of revising his works; unfortunately SRELS does not have the financial resources required for such huge tasks;

- The lack of a mechanism by which regular feedback from users of the classification could be obtained; for example the users of UDC have established a UDC Consortium (UDCC) that has strategic, managerial and promotional responsibilities related to the UDC. In addition UDCC also organizes regular international events to bring together specialists in knowledge organization and practitioners for deliberations and exchange of ideas

- The notation of CC has been a complex one and this has largely been due to the fact that in the earlier revisions the emphasis was on, what Ranganathan had referred to as, '*co-extensive classification*'; Increasingly it is being realized that for shelf arrangement of documentary resources in a library or their metadata records in a database (such as a bibliography), minute classification is not required. It is possible to cater to the more specific searches of end users without resorting to minute notational classification, if the index to the classification scheme is a comprehensive terminological resource.

To summarize, the idea is that the revised edition of *Colon Classification*

- should be simpler, easy to adopt use, and implement;

- should not require too much of re-classification on the part of libraries already using the scheme; The maintenance of the Master file should also make it possible to generate tables providing equivalents in the new edition for existing classification codes;

- should be a good source of vocabulary for building knowledge organization tools such as thesauri and ontologies;

- should be amenable for use to adequately explain and demonstrate the general theory of classification of Ranganathan and its application.

In other words the principal goal is to bring out a revised edition of Ranganathan's *Colon Classification* to ensure its continued use in libraries, its continued teaching in schools of library & information science and to comprehensively overhaul the scheme. As already mentioned this will benefit a large number of libraries in the country which continue to use the scheme as also ensure the continued teaching of the scheme in university schools of library & information science which are at present teaching an outdated

edition of the scheme. The principal advantage of teaching the scheme is that it will help the learners to think in a scientific and more logical fashion. CC is a scheme that has impacted thinking on library classification schemes and knowledge organization in general in the eight decades of its existence. The issue of maintaining the integrity of notation vis-à-vis accommodating new subjects and concepts in the universe of ideas will continue to be an important issue in the revision just as it is for any knowledge organization scheme. Technology has, however, made it possible to maintain master files of the schedules and index making the task of revisions in the future easier once a substantially revised edition is brought out.

The purpose of this paper is to generate some discussion and debate among LIS professionals in the country and particularly among those who are using the scheme. The SRELS looks forward to this feedback from LIS professionals in the country which will be used as a major input in the revision process.

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