

Principles for helpful sequence and their relevance in technical writings: A study

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A modest attempt is made in this paper to show how Ranganathan's Principles for Helpful Sequence are relevant in technical writings as writers need to organise the knowledge in a helpful sequence. Instead of relying on intuition, a deliberate understanding of the Principles for Helpful Sequence as recognised by Ranganathan would be more useful in bringing out effective products. The paper first outlines the eight Principles for Helpful Sequence and then goes on to explore the relevance of each of these eight principles to a wide range of technical documents. The paper concludes that an understanding of these principles is part of the core competencies of technical writers even in the web environment.

Keywords: S. R. Ranganathan; Ranganathan's Principles for Helpful Sequence; Technical Writings; Knowledge Organisation; Classification

Introduction

Classification is innate to human cognition as it brings some order into the chaos that surrounds human beings. As bringing order into anarchy is germane to human existence, human mind intuitively and continuously positions entities whether animate or inanimate, abstract or concrete into comprehensible groups. Whether we chronicle our history or recount our mundane everyday life or visualise the cosmos, we do so taking the recourse of harmonization. We harmonize on the basis of certain likeness that individual entities share. This process of sorting and grouping the like entities is called classification.

Eugene Garfield while paying a tribute to Ranganathan commented that "Ranganathan is to library science what Einstein is to physics"¹. Ranganathan strode like a colossus on the landscape of library science touching all its areas, big or small. However, his *Prolegomena to Library Classification*², which is a comprehensive theory of classification continues to have an immense international impact. In this historical work, Ranganathan gives a series of technical definitions for classification, explains the work of library classification on three planes, details the normative principles relating to classification, and ideates the canons, postulates and principles of classification; in other words he lays down the theory of classification thread bare which could lead to designing of new classification schemes. He has devoted an entire chapter to "Innateness of Classification" in his *Prolegomena*² where he says

that the essence of classification is "arrangement" and this "arrangement" has to be in a "helpful sequence." Further, this arrangement and its sequencing may be instinctive in humans, but the complexity of the nature of things demand deliberate classification. The innate ability to classify has to be deliberately exercised especially when we are talking of ideas and not just sundry physical objects around us. Thus he states that, "But innateness of classification holds good in respect of ideas too. Sharpness in thinking, clarity in expression, expedition in response, and exactness in communication depend ultimately on the deliberately [sic] exercise of the innate power of deliberate classification"². It would not, thus, be an exaggeration to say that out of the fifteen canons that Ranganathan has propounded for the work of classification in the Idea Plane, the Canon of Helpful Sequence appears to be taking the crowning glory.

Objective of the present study

The objective of the present paper is to explore the relevance of Ranganathan's Principles for Helpful Sequence in technical writings. A deliberate and conscious cultivation of classificatory knowledge is essential for clarity in thinking and communication. However, a course in theory of classification is not introduced in curriculum across disciplines at any stage of formal education, a concern that Ranganathan has voiced in his *Prolegomena*. Indeed a few subjects such as logic, zoology, production engineering, library and information science, etc. train their

students in deliberate classification, but a systematic training to all students in classification is an intellectual training that is essential for human progress. In fact Ranganathan points out that classification is “Itself an Education”². While pondering over the subject of ‘computer and classification’ Ranganathan wonders whatever may be the level of development in technology, whether librarians can ever totally abdicate their knowledge of classification? He very rightly states the following:

The library profession cannot throw away the responsibility to learn the discipline of classification and to keep it continuously cultivated. To get the best result from the computer, classification may need enrichment of a new kind, which calls for new research...can the computer be made to do research in classification?²

Hence, it is important to systematically train oneself in deliberate classification even in today’s web environment. A modest attempt is made in this paper to show how the Principles for Helpful Sequence are relevant for writing of technical documents as the writers need to organize knowledge in a helpful sequence in such documents. Instead of relying on intuition, a deliberate understanding of the Principles for Helpful Sequence as recognised by Ranganathan would be more useful in bringing out effective products. As information professionals are also engaged in information repackaging and consolidation services, a thorough understanding of these principles would enhance their skills and competencies.

Principles for Helpful Sequence

Ranganathan has devoted an entire chapter, viz, Part F of Prolegomena² to Principles for Helpful Sequence which belong to the work in the Idea Plane. Table 1 charts out the fifteen canons for the Idea Plane.

As seen in Table 1, Canon of Helpful Sequence is one of the four Canons for Array advanced by Ranganathan which belongs to the Idea Plane. An

Array is a set of coordinate classes that satisfies four conditions. Corresponding to these four conditions are the four Canons for Array. The classes or isolates in a set of classes or ranked isolates should be exhaustive as well as exclusive. In other words no entity in a universe of entities should be left out without a class in the process of grouping and at the same time the classes should be exclusive where no entity can claim a position in two classes resulting in cross classification. The classes or array isolates need to be arranged in a helpful order and not in an arbitrary sequence. Ranganathan has advanced eight Principles for Helpful Sequence to arrange the classes or array isolates in a set of classes or isolates. The fourth canon for Array merely guides to maintain consistently the sequence once decided as long as the purpose of classification remains the same. Table 2 displays the eight Principles for Helpful Sequence with their brief description².

Apart from library classification, these eight principles can be followed for organizing knowledge in any kind of document. These principles are equally relevant even in today’s web environment.

Relevance of Ranganathan’s Principles for Helpful Sequence in the electronic era

Many may argue that classification is no longer needed for retrieval purposes in the web environment. However, Knowledge Organisation (KO) as a science of arranging concepts systematically according to their elements would hold well as much in physical as in electronic environment. Precisely for that reason now more research is geared towards developing more and more Knowledge Organisation Systems (KOS) that are conducive to networked environment. Theory of classification underlies the construction of KOS tools used in the web environment, whether they are relationship models, categorisation schemes or word lists. Asund³ has detailed the application of Ranganathan’s Principles for Helpful Sequence in the tools and components of KOS. For instance, he shows that ontologies in the subject of medicine

Table 1 — Canons for Work in the Idea Plane

Canons for Characteristics	Canons for the Succession of Characteristics	Canons for Array	Canons for Chain	Canons for Filiatory Sequence
1. Differentiation	1. Concomitance	1. Exhaustiveness	1. Decreasing	1. Subordinate classes
2. Relevance	2. Relevant	2. Exclusiveness	Extension	2. Coordinate classes
3. Ascertainability	Succession	3. Helpful Sequence	2. Modulation	
4. Permanence	3. Consistent Succession	4. Consistent Sequence		

Table 2 — The eight Principles for Helpful Sequence

Eight Principles and their corollaries	Brief Description
1 Principle of Later in Time	Arranging according to time of origin
2 Principle of Later in Evolution	Arranging according to evolutionary sequence
3 Principle of Spatial Contiguity 31 Principles for entities along a Vertical Line	Arranging according to contiguity/nearness of space which could be bottom upwards, top downwards, left to right, right to left, clockwise direction, counterclockwise direction, from periphery to centre, centre to periphery or away from a certain starting position
311 Principle of Bottom Upwards	
312 Principle of Top Downwards	
32 Principles for Entities along a Horizontal Line	
321 Principle of Left to Right	
322 Principle of Right to Left	
33 Principles for Entities along a Circular Line	
331 Principle of Clockwise Direction	
332 Principle of Counter Clockwise Direction	
34 Principles for Entities along a Radial Line	
341 Principle of Periphery to Centre	
342 Principle of Centre to Periphery	
35 Principle of Away from –Position	
4 Principle of Quantitative measure	Arranging according to increasing or decreasing quantity
41 Principle of Increasing Quantity	
42 Principle of Decreasing Quantity	
5 Principle of Increasing Complexity	Arranging according to degree of complexity
6 Principle of Canonical Sequence	Arranging according to the traditional sequence
7 Principle of Literary Warrant	Arranging according to decreasing quantity of published documents on the entities
8 Principle of Alphabetical Sequence	Arranging, as a last resort, alphabetically according to the current names of entities

use the principle of Top Downwards when dividing the components of human body and the Principle of Increasing Complexity while arranging the diseases. Similarly, taxonomies use the Principle of Later in Time to display genealogy³.

Technical writings

Technical writing or its broader field technical communication has perhaps existed ever since the beginning of written languages. However, there was a spurt in scientific enquiry during the renaissance that resulted in more technical writings. Besides the advent of journals and the practice of research report writings, a series of technological developments starting from printing to electrical and electronic communications have had a tremendous impact on technical communications⁴. The advances in industries in general and in the field of medicine,

defence, commerce and consumer goods both electrical and electronic in particular have accelerated the growth of technical writings.

Technical writings endeavour to present information in a manner that is comprehensible to the audience that it is intended for. Society for Technical Communication attempts to define Technical Communication in the following manner⁵:

Some of the documents that contain technical writings are:

- Communicating about technical or specialized topics, such as computer applications, medical procedures, or environmental regulations.
- Communicating by using technology, such as web pages, help files, or social media sites.
- Providing instructions about how to do something, regardless of how technical the task

is or even if technology is used to create or distribute that communication⁵.

The same definition holds true for technical writings which happens to be a subset of the broad area of technical communication. Although technology is now being used extensively in technical writings and is demanding the need for digital and web skills, the core competency of organising information would remain the same. Therefore, the Principles for Helpful Sequence are very relevant for organising information in the technical documents.

Technical writings could be of a wide variety spanning an extensive range of audience and purposes. An attempt is made to list some of them below.

- User Manuals for consumer products, computer programmes, etc.
- Warning labels
- Product specifications and descriptions
- Memoranda
- Formal letters and other correspondences written to people outside the organization
- FAQs
- Websites
- Proposals to undertake projects
- Feasibility reports
- Technical reports
- Research reports
- Press statements
- Policy statements

In effect the list of technical writings can just go on. What is imperative is the clarity of presentation in such writings as they are aimed at a specific audience to quickly imbibe the required information. Hence sequencing the pieces of information in a logical order that is helpful to the audience in focus is the key to successful presentation.

Relevance of Principles for Helpful Sequence to technical writings

This section of the paper would explore the application and relevance of the Principles for Helpful Sequence to a wide genre of technical documents.

Principle of Later in Time

This principle is very useful in writing manuals that explain step by step installation of software or assembling of any home appliance or furniture. For instance, software especially like SQL server, Oracle, Android studio, etc. that involve complex steps

require step by step installation guidance starting from the first step and screen shot to the last step, exactly in the sequence of later in time for the user to understand. Similarly, assembly instructions for furniture or gadgets become effective when action diagrams along with assembly operations are given in the later in time sequence. Cookery books (for the method of preparing a particular food item), airways, railways or roadways time tables (for a particular destination) also follow the later in time sequence. In fact wherever the pieces of information can be arranged in their progressive time sequence, the Principle of Later in Time can be followed in such writings.

Principle of Later in Evolution

Quality research reports present a narrative in its evolutionary sequence. From the germination of the research problem to the fruition of its solution is an evolutionary process that every effective report writer follows. Phylogenetic trees representing evolutionary relationships among biological entities are often used in medical reports to present the diagnosis of a patient's disease. A process specification often uses an evolutionary sequence to document and explain the decision making logic. For clarity in process specifications, flow charts and decision trees are used which present the processes and procedures in their evolutionary sequence.

Principle of Spatial Contiguity

Instruction manuals for home appliances print the diagram of the appliance and number the various parts with arrows indicating the names of the parts. The diagram could be circular, oblong, rectangular, square, etc. depending on the shape of the appliance. User manuals become effective when parts are numbered based on the Principle of Spatial Contiguity. Those manuals which number the parts at random and use a legend to decode the numbers leave the harried user confused. An understanding of the Principle of Spatial Contiguity and all its corollaries by the technical writers would result in effective user manuals.

Principle of Quantitative Measure

Product catalogues are used to expand the user base as well as to act as an advertising tool. They are very carefully designed and organised to entice the potential customers. Often the printed product catalogues for one type of product would list them in

the order of their ascending or descending prices. Such an organisation is important so that potential customers can easily have their pick. Most of the sales and merchandising apps also provide the facility to display the pricing of the product or consumer plans in increasing or decreasing measure. This application of the Principle of Quantitative Measure to display the pricing makes the product catalogues more user friendly than any of their other features such as colourful photographs, exotic write ups or well designed websites.

Principle of Increasing Complexity

The leaflets or brochures that come with medicines while mentioning the ailments for which that medication can be used, list diseases in their increasing degree of complexity. For instance, the list of the tablet *Stemetil* goes like this: prevention of nausea and vomiting, treatment of nausea and vomiting, vertigo and Meniere's syndrome, schizophrenia and other psychotic disorders. However, the side effects of the medicines are often mentioned in their decreasing order of occurrence. Further, user manuals giving assembly instructions for larger appliances or furniture where several units have to be assembled to achieve the whole are effective when they use the Principle of Increasing Complexity. In other words, the instructions are given first to assemble simpler units and then complex and more complex units before finally installing big furniture such as huge kitchen cabinets or wall mounted TV sets.

Principle of Canonical Sequence

If subjects in an array of subjects are traditionally arranged in a specific sequence even when there is no underlying discoverable principle, then Ranganathan advocates maintaining such a traditional sequence². For instance, for writing of research proposals there is a traditional basic structure with some variations to organise the information. The traditional sequence is Introduction and background, statement of the problem, objectives of the research, literature review, research methodology and design, expected timeframe and budgetary considerations, and lastly bibliography. It would be better for a researcher to maintain this traditional sequence with slight variations than go for a sequence that is vastly different which causes confusion.

Principle of Literary Warrant

Wyndham Hulme's concept of 'Literary Warrant', which advocates inclusion of subjects in

book classification only when there is published literature on these subjects, was used by Ranganathan with a slight variation for his principle. According to him the subjects or isolates in an array may be arranged in the sequence of decreasing quantity of documents published on them². Many classification schemes follow this principle. There are also others such as Classification Research Group and National Information Standards Organisation (NISO) who have interpreted Hulme's concept slightly differently by shifting the focus from book titles to terms used in the published literature of the field. This interpretation is used in the selection of terms for controlled vocabularies. All such interpretations are relevant for technical writings. Whatever may be the technical document, it would be better for the writer to use professional words and concepts that are found in their respective literature. Also, while preparing a list of publishers or authors in a particular subject field, the technical writer can use the Principle of Literary Warrant.

Principle of Alphabetical Sequence

As per this principle, when no other sequence is more helpful than the earlier seven principles then subjects or isolates in an array of subjects or isolates can be arranged alphabetically according to their current names in the international usage². In technical writings alphabetical sequence can be used in a wide range of documents for sundry purposes. For instance, all kinds of reports such as feasibility reports, technical reports, research reports, project proposals, research proposals, etc. arrange their bibliographies at the end in alphabetical sequence as per the name of the authors. Often the lists of references in such documents are also arranged in alphabetical sequence by the name of the authors. Brief indexes, if any, at the end of manuals are arranged in alphabetical sequence by the terms indexed. If any glossary of terms for quick reference is included in such documents it follows an alphabetical sequence. Alphabetical sequence is the most convenient sequence for writers, but it should be used as a last resort when more helpful sequences for users are not possible.

Conclusion

Technical writings are age old and important for communicating technical and specialized topics. Owing to technological advancements, skills required for technical writings have undergone a radical

change and may be subject to more changes in the future. However, the core competencies would always remain the same and Ranganathan's Principles for Helpful Sequence are part of those core competencies. Rather than relying on intuition, a deliberate understanding of the eight Principles for Helpful Sequence become quintessential to the writers of technical documents because the basic aim of technical writings is to make the complex information helpful and usable to those who need them.

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