Facet: itself a multifaceted concept

Abstract
In recent literature on knowledge organization, we have identified four ways of looking at facets. In this paper, we present these four ways of looking at and of exploiting facets, and we use elements related to our own research project to show that it is possible, and not necessarily harmful, for a single facet to assume a dual identity and to play more than one role in an information system.

1. Introduction
The concept of “facet” is more popular today than in S. R. Ranganathan’s own time. This does not mean, however, that a definitive characterization of this abstract concept has been established, or that all those who talk about or use facets are entirely clear as to the nature and function(s) of this handy device. In his article “Des classifications aux thésaurus: du bon usage des facettes”¹, Jacques Maniez (1999) adopted a Linguistics perspective to describe what he perceived as a significant weakness of the faceted approach. In his Colon Classification (CC), Ranganathan allocated concepts to one of five fundamental facets (Personality, Material, Energy, Space and Time) on the basis of their essential nature; but he also proposed suitable indexing formulas for each discipline, giving to each facet a specific function in the “sentence” thus created. Maniez implied that Ranganathan was not able to, or chose not to, dissociate the semantic (nature) and syntactic (function) dimensions of facets in knowledge organization (KO) and information representation. The ambiguity introduced by Ranganathan was maintained by the Classification Research Group (CRG) (1955) and in the many subsequent sets of facets inspired by the CRG proposal. The fusion/confusion of semantic and syntax is observed today in the diversity of definitions and applications in contemporary information systems.

Our research team has had to confront this ambiguity while looking for relevant facets around which to structure an indexing and retrieval system for legal decisions. An analysis of recent KO literature revealed four ways of looking at facets; these have influenced the selection and naming of facets in our project, as well as the system under development. In this paper, we present these four ways of looking at and of exploiting facets, and use elements of our own project to demonstrate that it is possible for a single facet to assume a dual identity and to play more than one role in a single information system.

¹ “From classification to thesauri: making good use of facets”.
2. Nature and role of the facet

The facet has been presented as one of the most significant theoretical developments of the 20th century in Information science. But what is exactly a facet?

The concept of facet is an abstraction and is more difficult to define than any concept representing an object that can be observed and physically manipulated. Maniez (1999, p. 262) remarked that, even after decades of usage, the meaning of the concept remained to be standardized, the term facet appearing both in highly specialized domains and in popular usage and being applied in the context of any grouping process in extremely diverse settings. Today, the technology that makes possible the sharing of responsibilities for information distribution has opened a path to an even wider interpretation of the nature and role of facets in information systems. In 2018, facets are used to refine a search in the library catalogue or to filter commercial goods online.

We have identified four conceptualizations of the facet in KO literature and through functional applications in contemporary information systems. Each conceptualization is presented below in the form of a dichotomy whose poles would appear at first glance to exclude one another; we will see that this is not always the case.

2.1. Process or product?

Facet, as a concept and as a term, is used in everyday language. In general language dictionaries, a facet is a dimension of a complex reality observed from a particular angle, as well as a characteristic common to all members of a class. KO specialists have used facets as criteria, as a basis for allocating objects or concepts to classes, making facets essential to the dividing process. Ranganathan had to use this interpretation when he determined that an entity belonged to the Personality rather than to the Matter facet.

But the facet is often also seen as the resulting class, the product of the dividing process. The facet has been defined as any grouping composed of entities sharing one or more characteristics. Ranganathan reused the term facet to name the set of isolates offered as potential manifestations of a fundamental category in his CC (Beghtol 1995, p. 197).

2.2. Nature or function?

In 2004, the Association française de normalisation (p. 103; our translation) defined facet as “a non-thematic category allowing for the categorization of a set of concepts on the basis of their essential nature or the perspective from which they are considered. For example: phenomenon, process, attribute, tool, etc.”. This definition suggests a second significant way of looking at the facet.

When reference is made to the nature, the essence of an object or a concept, the categorization process consists in allocating objects and concepts to a facet, giving them a meaning which will not vary with the context of use; this is what Ranganathan did in
the first stage of developing the CC, and most faceted classification structures have adopted this approach to using facet. Fundamental and mutually exclusive facets (for example, living being, physical object, attribute, activity, space, time) are capable of conveying the true nature of a concept.

The facet can also specify the role played by the concept, its function in a specific communication context, such as the analysis and representation of a complex subject. In this case, the allocating of a concept to a facet is determined by this concept’s relationship(s) with others rather than by its essential nature. A single concept, whatever its nature, can play various roles in subject representation, in the same way that a word can play different roles in different sentences. This conceptualization of the facet brings to mind linguistic techniques of discourse analysis, such as Charles J. Fillmore’s case grammar.

The CRG (1955) insisted on the importance of this functional dimension of the facet by demonstrating that the same entity did not belong to the same grouping (or facet) in different disciplinary environments; straw, for example, is an Entity in Botany, a Material in Construction, and a Product in Agriculture.

Maniez believes that Ranganathan’s indexing formulas assign a distinct function to each concept in the context of subject representation and notes that Ranganathan’s Personality, Matter and Energy facets are simultaneously fundamental and functional.

Both Mills (2004) and Vickery (2008) confirm that there exist two distinct types of facets: fundamental facets (living being, time, matter, etc.) and relational facets (agent, type, part, product, etc.).

2.3. Object or subject?

Maniez has suggested that the unresolved ambiguity surrounding the notion of facet has something to do with the type of entities that facets describe and/or categorize: physical objects such as commercial goods and library documents, or abstractions such as the components of a subject in a subject heading (1999, p. 261). Ranganathan establishes a clear link between facet and subject when he refers to the facet as a generic term designating any part of a complex subject (Maniez 1999, p. 253).

Should facets be used to describe an object (a document, for example) or to identify the components of an abstract subject? Although this distinction does not appear to reduce the efficiency of information systems, one must wonder if it is possible to use identical sets of facets to describe a physical object, represent a subject and structure the concepts of a discipline. Broughton (2001, p. 88) accepts all interpretations when she states that categories can be based on any attribute of documents/subjects (our emphasis) which it is useful to identify to facilitate indexing/classification and retrieval.

The association between facets and documents as objects is best illustrated by the frequent use of the term facet to name those elements of the bibliographic description
used as filters in a library catalogue. Authors’ names, original language, subject and other elements of the descriptive record are thus assimilated to facets. Gnoli (2008, p. 129) views the practice as a loose interpretation of the faceted approach, more common in North America than in Europe. Broughton (2006, p. 61) talks of non-semantic filters, but does not reject this conceptualization, which leads to a fourth interesting dichotomy.

2.4. Structure or navigation?

During the course of the 20th century, KO specialists have concentrated their efforts on the best use that could be made of facets to classify documents and organize collections. They continued to focus on hierarchies, notation and citation order, expending much energy in describing the design stages of faceted classification structures that would end up being quite similar to their predecessors.

While the function of classification is to group similar objects and subjects, that of indexing is to emphasize distinctions between similar subjects in order to facilitate a more targeted retrieval (Tudhope and Binding 2008, p. 217). Users must be able to isolate any aspect of a subject that is relevant to their information need; this presupposes that each component of the subject has been represented clearly and independently by the analyst (Vickery 2008, p. 148); Vickery suggests that each element thus represented is a facet.

While KO specialists were busy looking for the ideal classification system, other interested parties discovered Ranganathan and his faceted approach, seeing the potential of facets to describe and explore more or less structured digital contents. Facets came to be seen as essential keys for discovery. Broughton (2013, p. 742) remarks that very few existing faceted systems are based on a classification structure or use a controlled vocabulary; rather, facets are applied to structure the navigation interface and they play a critical role as search filters.

In the digital world, the need to organize and structure has lost much of its relevance. Nowadays, the first priority is to describe precisely all types of information objects. The second priority is the design of interfaces and search engines that will facilitate browsing, navigation, retrieval and presentation of results. A set of well-defined and functional facets specifies the dimensions on the basis of which an object or subject can be represented and retrieved.

Even if it is possible to discuss the concept of facet without reference to classification and classification systems, we believe that it is not essential to do so. The same facets (criteria) used to generate subsets of entities (classes) can also be used, conversely, to describe each entity without the necessity to preserve any link to its parent subset. For instance, sex, occupation, age, and residential address are facets used to group individuals; the same facets can be used to characterize any single individual. This explicit way of describing facilitates retrieval by criteria without any obligation to apply
syntactic rules (or citation order) or to know which class should be looked into (Hudon 2007, p. 152).

3. Selecting and naming relevant facets

The possible combinations of these conceptualizations of the facet (for example, facet as function used to describe a subject with a view to facilitating navigation, or facet used to organize a collection of objects according to physical characteristics) add complexity to the definition and theorizing of the concept.

In the framework of an ongoing project whose objective is to propose an innovative approach to the analysis and retrieval of legal decisions (Hudon and Cumyn 2017), our team has had to confront such complexity. The four ways of looking at facets have influenced the selection and naming of facets in our project, and determined to some extent the role(s) they will be playing in the new information system. We have observed that a single facet could assume a dual identity and play multiple roles within a single information system.

At the start of the project, we believed that it would be possible to identify a small set of fundamental facets which would allow us to organize concepts in the discipline of Law. But this needed to be done while taking into account the necessity to use functional facets allowing for the discrimination of concepts relating to facts and context, legal problem and applicable rules of Law. Diverging visions within our team led to a priority shift from structure to navigation.

We first established a bank of general concepts extracted from sources such as Moy’s (1968) classification, and Sweet and Maxwell’s (2010) Legal Taxonomy. To these concepts, we added specific notions identified through the process of indexing a representative sample of court decisions. A first set of fundamental facets was generated, which would allow for categorization on the basis of the essential nature of concepts. These fundamental facets were: Person, Process, Physical object, Attribute, Event and Space. We soon realized that it was too often impossible to allocate a concept to a single facet, and the six original facets were replaced by a restricted set of three fundamental facets: Person or relation (for example, husband), Thing, Event. Kaiser (as cited in Svenonius, 1978) and Bhattacharyya (as cited in Maniez, 1999) had indeed suggested that a smaller set of facets would solve the difficulty of creating mutually exclusive classes, but we discovered easily that it was far from being the case. Furthermore, a most important facet was now missing, that of Action (Ranganathan’s

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2 Conception et évaluation d’un nouveau modèle d’indexation de la documentation juridique (Design and evaluation of a new indexing system for legal documents). Funded by the Canadian Humanities and Social Sciences Research Council for the period 2015-2020. Project leader: Professor Michelle Cumyn, Faculté de droit, Université Laval, Québec.

3 In his Systematic indexing system, Kaiser used three facets: Things (real or imaginary), Processes and Localities. Bhattacharyya built the POPSI system around four facets: Discipline, Entity, Action and Attribute.
Energy), which is almost always at the heart of a subject, or in our case, at the heart of the legal problem.

Moving away from fundamental facets, we tested a third set of facets, applicable to the Law domain. Each facet would now be considered functional, specifying the role of a concept in the statement of facts causing the legal problem, and in the description of consequences. A characterization of the legal discipline and practice suggested six functional facets: Subject (of Law), Action, Object, Context, Legal regime/rules, Consequences/Sanctions.

These six facets allowed for a precise description of non-legal elements in the representation of facts generating the legal problem and court case, as well as for the description of Law-related elements invoked by the judge in his or her decision. Following discussions and terminological adjustments, it was decided that the set of functional facets that would be used to index and retrieve legal decisions in our prototype database would be: Person, Action, Thing, Context, Legal regime and Remedy/Sanction were excluded from the set of functional facets, as they would not be extracted from the decision itself; they are now seen as classes to which decisions are allocated after analysis.

The facets and classes are being tested by indexers who have been provided with three autonomous controlled vocabularies. The first vocabulary is a structured list of descriptors, whose form and meaning have been standardized. Descriptors are associated to one of the four facets (Person, Action, Thing, Context) at the time of indexing only, each concept being given a function in the statement of facts leading to the court case. The second vocabulary is a classification system replicating the structure of laws and regulations applicable to the sub-domains represented in our prototype database. The third vocabulary is a controlled list of applicable remedies and sanctions.

In a system structured around functional facets, each concept is allowed to play different roles in different contexts, all the while preserving its true nature and essential characteristics. A concept can represent the action at the heart of a particular court case, but be an element of context in another case; for example, the accident is at the heart of the decision where the issue is one of responsibility, but it belongs to the context where the court has to judge the fairness of a sanction imposed to the worker who was late because of the accident. In our set of facets, Person and Action, and Person and Thing are mutually exclusive (a person can neither be an action nor a thing). Context is the most inclusive of all four facets since it will comprise concepts referring to persons, actions and things. Person and Action are simultaneously fundamental and functional facets, since they evoke both the nature and the function of a concept.
4. Conclusion

As a foundational element of classification systems, facets have traditionally been used to structure document collections, disciplines, even the whole of knowledge. In the digital information world, facets more often act as filters to facilitate navigation and retrieval, and to improve the presentation of search results. But the very nature of the concept of facet remains ambiguous.

Maniez has suggested that terminological refinements could clarify the contemporary discourse around the concept of facet (1999, p. 261). He proposed that the term facet always be associated with the qualifier “classificatory”, so that it is recognized as an Information science concept. He also distinguished two types of classificatory facets; categorial facets apply to any classification of concepts, regardless of domain, while structural facets describe the essential components of an entity or a subject. Maniez connects categorial facets with the paradigmatic axis and the structure of language, and structural facets with the syntagmatic axis and the discourse. There should be very few of the former but a great number of the latter, which will differ from one field of application to the others. Though intriguing, such terminological specifications are not sufficient to solve the original ambiguity as to the nature and function of facets. Furthermore, Maniez’s proposal reflects a conceptualization of the facet as a basis for classification, as a structuring device rather than as an aid to navigation and retrieval.

The term facet is widely used today by various groups of people concerned with the exchange of goods and of information; used in different contexts, it can designate a category, a class, a cluster, a characteristic, a criterion, an aspect, a filter; the term facet can designate the chronological dimension expressed by a subdivision in a subject heading as well as a non-essential attribute, its cost for example, of a product sold online. The ambiguity introduced by Ranganathan and maintained by the CRG and others authorizes such a wide appropriation of the concept; there seems to be no way around it.

It remains to be proven, however, whether this ambiguity has significant negative consequences on information representation and retrieval. Research is needed to examine the actual impact of the phenomenon on the quality of retrieval. Though facets and faceted analysis have been at the heart of numerous publications and scientific gatherings over the past 20 years, discussions seldom ventured beyond theoretical grounds. Applications of facets in operational retrieval systems, as abundant and popular as they may be, must be rigorously evaluated. As KO specialists, we need to demonstrate that the use of predefined facets in subject analysis and representation, as well as in the search and navigation interface, leads to quantitatively and qualitatively better search results, or minimally to results that are at least equivalent in relevance to those obtained in systems using descriptors or keywords, without syntax, to represent...
the same subjects.

In our project, two stages of validation of the four functional facets and two classes
guiding the indexer and the searcher (here the lawyer looking for one or more relevant
court decisions) are scheduled. Usability studies will support our assessment of the
usefulness of facets, and make possible a comparison of the relevance of decisions
retrieved with or without the assistance of those same facets.

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