Towards a General Conception of Warrants: First Notes*

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Abstract: The areas of knowledge are organized around the identification of their terms of reference and the relationships established between them. This is the rational basis of -among others- the methodology for the development of knowledge organization systems. The authority from which to select, evaluate or revise the terminology of these systems is established in relation to any of the twenty-one warrants (literary, cultural, etc.) that have been proposed and studied unequally and autonomously in the literature of the area. This paper intends to introduce initial notes and comments to advance towards an overall conception of the warrant notion. For this purpose, the expression "warrant" is studied as a word of the general language as well as a term of specialized languages. Then, the scope of application of the warrants is established. Next, each warrant is placed in one of the approaches proposed by Hjørland to categorize theories and methods (empiricism, rationalism, historicism and pragmatism). From the above, some lines of research problems are identified. A typological table that includes data on all the warrants established until now is proposed, and the first conclusions are drawn.

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1.0 Introduction

Terms constitute the basis of the conceptual structures constructed in each discipline or subject field to present in an organized way its main concepts, as well as its premises, principles, theories, categories of analysis, agreements and divergences (Cabré 1993; Burke 2002, 111-152). The areas of knowledge are organized, reviewed and updated not only based on the identification of their terms of reference but also on the relationships established between them. This is the rational basis of the methodology of vocabulary control operations and, therefore, of the procedures for developing knowledge organization systems, such as thesauri, taxonomies and classification systems (Iyer 2012). The warrants constitute the invisible support, the disguised criteria for the selection of terms for inclusion in knowledge organization systems and information systems in general with the main objective of favoring subject retrieval.

According to a definition given by Beghtol (1986, 110), which can already be considered canonical:

> warrant of a classification system can be thought of as the authority a classificationist invokes first to justify and subsequently to verify decisions about what classes/concepts to include in the system, in what order classes/concepts should appear in the schedules, what unit classes/concepts are divided into, how far subdivision should proceed, how much and where synthesis is available, whether citation orders are static or variable and similar questions.

The abovementioned is the first definition of warrant recognized in the literature of the area, so it is possible to speak of a late identification of the concept, especially if it is considered that Hulme had already established in 1911 the initial explanation of what he called "literary warrant," one of the specific varieties of warrants. It turns out then that the spe-

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cific concept was coined seventy-five years earlier than the corresponding generic concept. Hulme mentions that literary warrant is a test of validity of a heading, as an indirect expression of what he understood as an actual warrant (Hulme 1911, 447). Nowadays, as will be seen, there is a record of more than twenty warrants that have been proposed as support or authority in the selection of the terminology contained in knowledge organization systems, which speaks, on the one hand, of the recognition of the validity of this concept and its usefulness in the processes of construction, revision and evaluation of knowledge organization systems; and on the other, the need to return to the general notion of warrant in order to reflect on its essence, scope and future applications.

Although some authors after Beghtol have made progress on the concept of warrant, especially in recent years (Cochrane 1993; Duff 1998; Campbell 2008; Barité 2011, 2018; Bullard 2017), there is a need to constitute a more homogeneous, stable and profound body of ideas. This work aims to be a first approximation to this objective. To that end, the sequence will be as follows:

i) the warrant as a word of the general language and as a term of the specialized languages;
ii) the scope of application of the warrants;
iii) the tentative placement of the warrants in one of the four epistemological approaches proposed by Hjørland to categorize the theories and methods in knowledge organization: empiricism, rationalism, historicism and pragmatism;
iv) types of warrants and presentation of a typological table that includes all the warrants proposed to date in the literature;
v) the identification of research problems on warrants;
vi) the first conclusions on the way to a general conception of the warrants in knowledge organization.

The mere statement of such an ambitious goal as the development of a general conception may seem excessive or disproportionate. However, there are enough propositions, ideas and contributions of a theoretical and methodological nature scattered here and there in the literature of knowledge organization to begin to assemble the pieces of the puzzle. These brief initial notes, of a generic but comprehensive nature, constitute the first result of exploratory research to be continued.

2.0 Analysis of the notion of warrant

2.1 Warrant as a word of the general language and as a term of specialized languages

A first issue to be noted from the semantic point of view is that "warrant" is a word of the general language as well as a term registered in the language of different specialized fields. Thus, it appears in the terminology of domains such as banking, finance, business, constitutional, civil and commercial law. The term "warrant" has also been used in academic texts as the justification for an argument, the evidence that supports an idea (for example, Nunns, Peace and Witten 2015) or the philosophical discussion of beliefs (Plantinga 1993).

It is not the object of this work to determine whether the word went from the general language to the specialized language or vice versa, although it can be presumed that the need to strengthen commitments, debts and obligations between people, and later between people and/or institutions or states, has accompanied the parallel evolution of the word in the general language, and the term in the mentioned specialized areas. In its semantic evolution, the expansion to meanings such as "foundation," "justification" and "reason" is also included.

In the territory of knowledge organization, the warrant strengthens in the first place the relevance and adequacy of a term to represent a concept, so that this term can be used for the classification or indexing of data, documents or information. That said, it would seem that the issue of warrants is settled term by term. However, if the warrant will constitute an intellectual criterion to select the terminology of a knowledge organization system (Huvila 2006), which aims to obtain a consistent and updated subject representation of a domain, then a comprehensive view should prevail. Bullard points out (2017, 76) that the

> warrant is an element of all classification design, regardless of whether it is named as such and regardless of the particular technological basis of the system. Indeed, warrant is a common thread across a wide variety of systems ranging from traditional library classification to in-application menus and categories for web-based collections [because] all designers of textual organizing schemas must look to some source of terminology.

From this broad perspective, the warrant should be seen as a tool not only for conventional resources such as a thesaurus, but also for the choice of expressions intended for any grouping of documents or data on the internet. Going a little further, their use and potential could be extrapolated to other areas, such as the selection of the terms to

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be included in a specialized dictionary, based on the same arguments and methods.

In order to better justify the need for an integrated epistemological perspective, Olson (2004) tracked the bottom line of the notion of warrant in Francis Bacon's knowledge classification work and its reflections on library classification systems. In that work, she points out that Bacon created a knowledge structure based on a common episteme on which the classificationists have been assembling their system designs from the nineteenth century onwards. And she concludes (Olson 2004, 4) that: "perhaps we should also follow his epistemological warrant and let our classifications not only reflect knowledge, but also have a role in directing the creation of new knowledge." This neo-positivist perception may have led, in a more or less intuitive way, the classificationists to fuel—over a century and a half—an allegedly common epistemological vision, in order to validate the idea that the precepts of science are objective, neutral and universal in scope.

In a more hidden way perhaps, it was gradually established that the justification of the terminology of a knowledge organization system should be taken in full, either from the formal language of science and science education (Bliss 1929) or from the terminological evidence provided by the documentation (Hulme 1911). This traditional scheme gradually broke down with the proposal of new warrants (cultural, user, organizational, among others), which constituted breakpoints in two ways: 1) in relation to the alleged objectivity and neutrality of the language of science; and, 2) regarding the desirability of maintaining a single warrant for all the terminology selected in the process of developing a knowledge organization system.

When Beghtol states that the warrant is the authority that a classificationist invokes (Beghtol 1986, 110), she places in that authority the source of legitimacy and the ultimate basis for decision-making regarding the terminology to be included in or excluded from a knowledge organization system. She says it unequivocally: the warrant is the authority. This principle of authority may be firmly established in the terminology chosen by those responsible for a knowledge organization system, or it may be more or less blurred, as a consequence of the selection of ambiguous, generic or hybrid terms, or not sufficiently representative, according to the greater or lesser degree of methodological rigor in the selection and systematization of the terminology. A more or less corresponding relationship should then be presumed between the strength and the adequacy of the authority or warrant and the quality of the final terminology product.

Two of the six definitions established by the Dictionary of the Real Academia Española for the entry "authority" are applicable in this context. The third meaning says "prestige and credit attributed to a person and/or institution for its legitimacy or its quality and competence in some matter." And the sixth meaning establishes that authority is every "text, expression or set of expressions of a book or writing, which are cited or alleged in support of what is said" (Real Academia Española 2014, 246). Although the two meanings seem to fit better with the traditional vision of warrants, considering the social respect for the word of scientists and thinkers, and the veneration for the written word, the truth is that they also allow new authority figures to fit into them: the leaders of certain cultures or minority groups, the alternative terminologies proposed by thinkers or social movements—especially the countercultural ones—or even by the suppliers of new technologies. The doors can only be opened to new authority figures if new warrants different from the traditional ones are introduced, warrants which meet the needs of subject representation of groups, cultures or subcultures of low visibility.

2.2 Scope of application of the warrants

Beghtol's groundbreaking definition (1986), besides being extremely detailed, is very accurate. For example, it is a merit of hers to propose the incidence of the warrant at two levels or times: that of the initial justification (that is, when creating or selecting a descriptor or subject heading) and in the verification (for example, at the time of the evaluation of the quality and relevance of a term). This implies that the warrant can be used as guidance and as a tool in the three most important processes that a knowledge organization system can go through: its construction, its evaluation and its revision. Therefore, the tuning of specific methodological devices to choose, assess and replace or update their terminology fits here.

Another of the high points of Beghtol's work is the statement—never contested in the literature of the area—that the warrant must be applied at all stages of the design of a knowledge organization system, namely:

i) in the selection of the terms of classification and indexing;
ii) in the selection of the relationships established between them, an issue also mentioned later by other authors (Rowley 1987; Barité et al 2015, 77);
iii) in the arrangement of the terms of the facets, thus resuming the original application of the literary warrant proposed by Ranganathan in his Prolegomena (Ranganathan 1967, 196);
iv) in the choice of criteria for the subdivision of matters;
v) in the determination of the specificity levels;
vi) in the application of synthesis mechanisms (as in the choice of auxiliary tables or the signs of combination of issues), the selection of syntax devices; and
vii) in the citation order of matters (Beghtol 1986, 110)

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At this point, it should be noted that warrants can become epistemological references, organizational criteria or tools at the service of a terminology selection method.

It is noted that the type of warrant applied to the selection of classification or indexing terms may affect not only the decision to include or exclude terms but also the distinction between authorized and unauthorized terms. Indeed, the decision that is taken, for example, to establish in a thesaurus that the term "small states" will be a descriptor, while its synonym "microstates" will be considered a non-descriptor, must be based on a criterion supported by a warrant. The way to warrant relationships between terms has been an issue just outlined in the literature, both from a theoretical and methodological point of view, so it constitutes an open line for research. In these notes, as a first statement subject to review, it is suggested that the warrant procedure for hierarchical relationships between terms should be different from the procedure for associative relationships.

Indeed, the hierarchical relationships established in a knowledge organization system are usually those formally stated and accepted in different disciplines. They are stable, proven and not casual relationships. On the other hand, the systems usually provide the possibility for the classifier, the indexer or the end user to establish an associative relationship between two issues, perhaps because it may be temporary or provisional. Of course, this division of qualities between hierarchical and associative relationships is not absolute, at least as regards a large set of associative relationships that are firmly established in the world of knowledge and documentation (for example, the relationships between church and state, or the relationships between certain plant or animal substances and the treatment of diseases). If this provisional starting point is accepted, the warrant for hierarchical relationships that are established in a knowledge organization system should more reasonably come from the formal classifications of the disciplines (what is known as academic warrant). While to justify an associative relationship the most appropriate warrant for each case should be identified.

2.3 Warrants and epistemological theories

In different works, Hjørland (2003, 2006, 2013, among others) has given evidence of the importance of associating epistemological approaches to the analysis of theories and methodologies in knowledge organization. The most evident advantage of this procedure is that each theory or set of ideas and each method can be inserted into a more general category of analysis, thus taking advantage of all the accumulated flow of reflection made from each epistemological approach. Thus, information science (in particular knowledge organization) is linked in an approachable way to the more general foundations of the sciences and disciplines. Besides, these intellectual tools can be applied to any topic of interest as an object of study for knowledge organization (as is the case with warrants).

The four epistemological-based approaches proposed by Hjørland are: 1) the empiricism, which is justified by the data coming from the set of observations and their corresponding inductions; 2) the rationalism, which proposes the development of knowledge based on principles of pure logic or pure reason and which relies substantially on deductive processes; 3) the historicism, which promotes the organization of knowledge based on chronological, evolutionary and/or contextual studies of each field of knowledge; and finally, 4) the pragmatism, in whose essence the analysis of reality is based on the determination of values, goals and consequences (Hjørland 2003, 2006, 2013). In this exploratory work—in the table presented in Appendix A—each warrant will be related to at least one of the four approaches mentioned on account of future particular analyses.

2.4. Warrant types

In a recent review of the existing literature on the topic, a total of twenty-one warrants proposed, named and used in knowledge organization and close subject fields (Barité 2018, 528) were registered. In that work, there is a synthesis table with the relation of all the warrants. Not all the authors explicitly coined the term "warrant" although it was clear in the respective texts that, in essence, they were talking about the authority invoked to represent knowledge through descriptors, headings, keywords, classification numbers, taxa or others symbols. For the purposes of this paper, the aforementioned table (which due to its length is presented—as we said—in Appendix A), was revised and expanded, with the aim of presenting the twenty-one warrants in a single graphic expression, clear and exhaustive, with the following data: name in English, name in Spanish, author who proposed it and the year of coinage. A column of comments was also added as well as another column that provisionally places each warrant in one of the four epistemological-based approaches outlined above. In the table, the warrants are arranged in chronological order of proposal.

Since the concept of literary warrant (Hulme 1911) was introduced, of the twenty remaining warrants, those most frequently referenced are cultural warrant (Lee 1976; Beghtol 2002a), academic warrant (Bliss 1929; Sachs and Smiraglia 2004) and user warrant (Lancaster 1977; Hjørland 2013). Basically, they are distinguished, because they invoke different sources of authority to collect terms: the language of communities with their own cultural or local identity (cultural warrant), the formal vocabulary of disci-

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plines, consensus among specialists and expert opinion (academic warrant) or the expressions that users use in their searches (user warrant). The other warrants, however, have only been sporadically dealt with, and there is no sufficient theoretical, methodological and critical reflection on them.

Anyhow, the proposal of such a high number of warrants, which implies the resort to their corresponding—and different—sources of authority, may be due to some (or several, or all) of the following causes:

i) the insufficiency of each particular warrant to decide in each instance in which it is required to select terminology to represent knowledge and retrieve information;
ii) as a consequence of the above, it can, therefore, be stated that there are no universal solutions, but only options of scope and partial effectiveness to justify terminology;
iii) in accordance with what is established by one of the premises of knowledge organization, the same articulated set of knowledge can be organized in n number of ways (Barité 2001, 48-49), according to the possibility of using different epistemological or practical perspectives of that set, which implies that each of these perspectives can be supported by a particular type of warrant;
iv) the increase of the issues related to the subject representation of knowledge in digital information environments, which are geared towards setting, tagging and translating the terms of any field or discipline to favor its search and access.

2.5 Identification of research problems on warrants

The status of the situation that has been outlined in this exploratory research regarding the works related to warrants in knowledge organization allows us to identify three kinds of matters that could be subject to research: theoretical, methodological and applicative issues. From a theoretical point of view, the exhaustive review of literature carried out to support this work shows that there is a more or less consolidated body of accumulated knowledge on literary warrant: canonical articles (Rodríguez 1984; Beghtol 1986), comprehensive studies and postgraduate theses (Barité 2011, 2018), regular production in recent years (Howarth and Jansen 2014; Bullard 2017), as well as a recurrent analysis of the application of literary warrant to the *Library of Congress Classification* (for example, Hallows 2015) or the *Dewey Decimal Classification* (for example, Vizine-Goetz and Beall 2004).

A limited number of works has been devoted to a second group of warrants, in which generic introductions and general approaches to the characteristics, purposes and utilities that each warrant can offer are usually found. This is the case of cultural warrant, user warrant, organizational warrant, academic warrant and more recently indigenous warrant. A third group brings together the warrants that have been proposed and/or mentioned occasionally and that do not have significant subsequent development, as in the case of market, structural or autopoietic warrants. These last two groups of warrants do not have enough critical analysis yet, and they need it.

From the methodological and applicative point of view, there is a wide research scope on a series of issues that have no definitive answer, and in some cases, not even partial hypotheses or interpretations. These questions can be grouped into two categories: those related to the application of a warrant autonomously and those that propose the convenience of combining two or more warrants to support the box of terms of a knowledge organization system or an information system.

Among the first, there appear the following questions: 1) How do we decide the most appropriate warrant for each system?; 2) How do we guide the choice of one warrant and not another one?; 3) What methodologies does each warrant offer for its application?; 4) In what thematic, documentary or information contexts can a warrant be applied?; 5) How is the "performance" of a warrant evaluated on the basis of the principles of consistency, exhaustiveness, thematic adequacy, linguistic adequacy and other indicators that can be proposed?; 6) How do technological advances contribute to or hinder the application of warrants based on algorithmic mechanisms of automatic or semi-automatic subject assignment?; 7) What theoretical principles and methodologies related to warrants are valid in digital information environments?; 8) How are warrants linked to natural language indexing?; and, 9) On the other hand, can it be proven that the selection of a single warrant ensures the terminological consistency required for the system to be useful for users? In relation to the latter, it is pertinent to wonder, given the variety of warrants that have been proposed by different authors for over a century, if they can be combined or complemented to obtain a better quality and adequacy of the terminology, or if some exclude others, and in the latter case, which do and which do not and why.

Opinions in the literature of the area are divided. Svanberg believes in the complementary use of warrants but also that some may be opposed to others, without providing further explanations (Svanberg 1996). Bullard, on the other hand, expresses (2017, 77) that "the various warrants available to classification designers represent contradictory positions in classification theory yet they compete and are combined by classification designers in daily practice." After taking a position on the literary, academic, user and ethical warrants, and discussing the possible compatibilities and incompatibilities between them, she states (2017, 77) that "inevita-

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ble compromises of daily classification work" [require] "the interaction between warrants."

Huvila believes that two or more warrants may be opposed to each other, but he proposes to incorporate the concept of hospitality, as reinterpreted by Beghtol (2002a), because (Huvila 2006, 60) it "may be used to denote an ability to incorporate both intra and inter warrant differences i.e. eventual changes within and between individual warrants." Wan-Chen Lee, on the other hand, generates ideas to understand the nature of the conflict between several semantic warrants, and offers some negotiation alternatives for their use and combination, within the framework of the evaluation processes of knowledge organization systems (Lee 2017).

From this brief review, there appear to be many blind spots that can be used for research on the theory, methods and applications of warrants, in an area in which the emergence of new types of knowledge organization systems has been constant in the last twenty-five years (ontologies, web taxonomies, folksonomies and social classifications, among others), as well as technological innovations that have had an impact on customs and habits in relation to the search of and access to information.

3.0 Conclusions

Warrants are currently seen as an essential component in the process of construction, evaluation and revision of knowledge organization systems, to the extent that their proper understanding and application should ensure consistent terminology, updated and adjusted to the purposes of system designers, and users' information needs. Moreover, warrants can be used as tools to guide natural language indexing, contributing to correct the undisciplined tagging of social classifications, or they can contribute to the selection of terms to be defined in a specialized dictionary, among other possible uses. There are no substantial differences regarding the definition of the notion of warrant. The authors seem to agree that these are theoretical-methodological criteria that guide the selection of terminology in all information contexts where subject representations are needed, and they are assigned as their main task to justify the inclusion, weighting or exclusion of terms.

The root of the issues faced in this work has a promising basis: in the last twenty-five years, the academic production on this topic has increased and has been greatly enriched, and in its diversity of approaches it has left a particularly fertile ground for the discussion of ideas. In the mentioned period, thirteen different warrants have been proposed, a regular work flow has been generated (both in the form of journal articles and conference papers) and the critical mass studying the warrants has significantly increased on an international level. However, a reorganization of the area is necessary. It is noted that there is a need to build an overall view, and to go in-depth in a series of issues that have been treated generically so far. It is also necessary to induce from what has been produced rules, premises, principles and methods that may be common to all warrants or that require their proper specification. Longer term works (monographs, books, postgraduate theses) that focus on this subject are also required.

On the way to a general conception of the warrants, this exploratory work has revealed—without exhausting the matter—different points of conflict, discussion or exchange of ideas around the warrants, and in particular, an important number of questions that could guide future research on the subject have been formulated. Perhaps the time has come when instead of thinking about expanding the list of warrants, it would be more productive to devote greater conceptual, methodological and applicative content to each of them, since they mostly have scarce literary warrant to support them.

The establishment of the relationship between warrants and epistemological theories is also relevant to promote a greater conceptual depth as well as to provide more support to field studies. Perhaps the most significant aspect to promote research in the area is that the topic of warrants remains particularly valid due to the importance assigned nowadays to subject retrieval on the internet, databases and databanks and other sources and information systems, linked to science, commerce, e-government, culture and entertainment industries. Their projection and utility are, therefore, sufficiently consolidated.

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Appendix A: Typological table of warrants

Name in English	***Name in Spanish***	***Author and year***	***Comments***	***Approach***
Usage	Uso	Cutter, 1876	Antecedent of the user warrant	Empiricism
Literary warrant	Garantía literaria	Hulme, 1911		Empiricism
Scientific/philosophical and educational warrant (consensus)	Garantía científico / filosófica y educacional-consenso	Bliss, 1929	Antecedent of the academic warrant	Rationalism
Cultural warrant	Garantía cultural	Lee, 1976		Pragmatism
User warrant	Garantía de usuario	Lancaster, 1977		Empiricism
Logical warrant	Garantía lógica	Fraser, 1978		Rationalism
Request oriented warrant	Garantía orientada a la consulta o solicitud	Soergel, 1985, p. 230	Maybe a type of user warrant	Empiricism

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Name in English	*Name in Spanish*	*Author and year*	*Comments*	*Approach*
Semantic warrant	Garantía semántica	Beghtol, 1986	Generic name given to the literary, cultural, user and scientific/philosophical and educational warrants	Empiricism Rationalism Pragmatism
Gender warrant	Garantía de género	Olson and Ward, 1998	Maybe a type of cultural warrant	Pragmatism
Phenomenological warrant	Garantía fenomenológica	Ward, 2000		Empiricism
Structural warrant	Garantía estructural	Svenonius, 2000		Rationalism
Ethical warrant	Garantía ética	Beghtol, 2002b	Related to the cultural warrant	Pragmatism
Academic warrant (also named scholarly warrant)	Garantía académica	Sachs and Smiraglia, 2004	Similar to the scientific/philosophical and educational warrant	Rationalism
Organizational warrant	Garantía organizacional	National Information Standards Organization, 2005		Empiricism
Autopoietic warrant	Garantía autopoiética	Mai, 2011	Based on Rafferty and Hidderley, 2007. Maybe a type of user warrant	Empiricism
Textual warrant	Garantía textual	Tennis, Thornton and Filer, 2012		Empiricism
Market warrant	Garantía de mercado	Martínez Ávila, 2012		Empiricism
Indigenous warrant	Garantía indigenista	Doyle, 2013	A type of cultural warrant	Pragmatism
Genre warrant	Garantía de géneros	Andersen, 2015	A type of cultural warrant	Empiricism Pragmatism
Epistemic warrant	Garantía epistémica	Budd and Martínez Ávila, 2016		Rationalism Pragmatism
Policy warrant (corresponding to policy based indexing)	Garantía en políticas	Hjørland 2017,	A type of cultural warrant ?	Rationalism Pragmatism

Source: Barité (2018), revised, modified and expanded table for this paper.

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