Reviews

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Interdisciplinary Knowledge Organization by Rick Szostak, Claudio Gnoli, and María López-Huertas. Cham: Springer, 2016, 227p. ISBN 978-3-319-30147-1. US$129; 114,99 €; £86.00

1.0 From a manifesto to a monograph

Almost a decade ago, the so-called "León Manifesto" (ISKO Italy 2007) was anonymously presented as an essential outcome of the 8th conference of the ISKO Spanish chapter, devoted to interdisciplinarity and transdisciplinarity in the organization of scientific knowledge. As a matter of fact, this proposal for a new approach to knowledge organization (KO) has received a considerable amount of attention and encouraged many subscribers from the international KO community. But as is typical for an ambitious manifesto, the basic ideas were only sketched out in broad strokes in less than three pages. Now the first monograph dealing with these issues has been published by Springer as *Interdisciplinary Knowledge Organization* in order the flesh out the details.

The three authors, among them undoubtedly the main initiators of the *León Manifesto*, are already well known for their research within the intersection between information science and interdisciplinarity. Rick Szostak, the former president of the Association for Interdisciplinary Studies, is developing the Basic Concepts Classification (BCC) as a knowledge organization system (KOS) explicitly intended to serve interdisciplinary purposes (Szostak 2012; 2004). Claudio Gnoli, library and information scientist with roots in the natural sciences, is leading the international research project Integrative Levels Classification (ILC) that features some experimental innovations and a faceted classification with a remarkable level of detail (Gnoli 2008). Finally, María López-Huertas, library and information scientist and the former president of the International Society of Knowledge Organization, is critically examining the theoretical foundations of KO in face of the challenge of multidimensionality and disciplinary fragmentation of knowledge as exemplified by her research on the interdisciplinary field of gender studies (López-Huertas 2013; 2006).

The line of argument presented in *Interdisciplinary Knowledge Organization* starts from the assumption that the increasing complexity and interdisciplinarity in many research fields call for a new kind of KOS that enables users to cross disciplinary borders and to shift perspectives, for example, in terms of theories adopted and methods applied. Therefore, the point of departure for the development of a comprehensive KOS should not primarily be disciplines or knowledge domains that investigate phenomena from a particular point of view but rather phenomena itself, understood as common sense generalizations. It is proposed that a basic schema of phenomena, which is arranged according to the organizing principle of integrative levels, should be supplemented by analytico-synthetic techniques of faceted classification that allow one to freely combine multiple aspects of phenomena depending on the purpose of investigation such as authorial perspectives or relations to other phenomena.

The structure of the book, which includes many helpful summarizing tables and separated references for each chapter, makes it easy for the reader to follow the central theme. The first part (chapters 1-2) introduces the concept of interdisciplinarity and gives an overview of its role and needs in research and teaching while the main part (chapters 3-7) presents the basic tenets of the proposed phenomena-based KOS and how it can be developed. Most notably, the chapter "Domain Oriented Interdisciplinarity" deals with methodological questions for domain analysis of so-called interdisciplines, that is, fields covering multiple disciplines. Finally, the last part of the book (chapters 8-10) summarizes the expected benefits of this approach, explores further application fields such as semantic web technologies, and discusses some potential theoretical criticisms. The latter point deserves particular attention since the KO community appears to be divided into two opposite camps with regard to the metatheoretical foundation of the field, often summarized as modernist versus postmodernist, ontology-oriented versus epistemology-oriented, or universal versus domain-specific approaches as contrasted, for example, in the ongoing Hjørland-Szostak debate (Hjørland 2010; 2008; Szostak 2008a; 2008b). This book review will focus on the question in which way *Interdisciplinary Knowledge Organization* is able to integrate insights and concerns from both sides, as it is suggested in its recommendation to blend "a comprehensive classification with domain-

specific classification practices" (Szostak, Gnoli, and López-Huertas 2016, VI).

2.0 Knowledge organization and interdisciplinarity

The traditional term "universal classification" has long lost its sublime sound in knowledge organization discourse. Under the condition of epistemic pluralism, it is now widely accepted that different knowledge domains or practice and discourse communities require different and socially relevant KOSs, whereas the practical value for a kind of one-fits-all classification is highly doubted. The general conclusion is often drawn that the development of KOSs should limit the focus to particular user groups such as scientific communities of more or less well-defined disciplines that share a common set of language games or paradigms (Mai 2003; Hjørland 1997). In other words, if different knowledge domains represent incommensurable views, then they could hardly benefit from one and the same conceptual ordering system like a classification, thesaurus, or formal ontology. In the long run, however, this would lead to a fragmentation of knowledge and to isolated domain-specific KOSs, obviously serious challenges for information scientists who seek to serve research in which more than one scientific community or knowledge domain is involved, namely multi-, inter-, or transdisciplinary studies (De Beer 2015). These challenges are in particular addressed by *Interdisciplinary Knowledge Organization*.

To avoid misunderstanding, the authors eschew the term "universal classification," which often means both generality in coverage and unity of perspective. While the preferred terms "general classification" or "comprehensive classification" emphasize the generality of coverage, it is acknowledged that the "idea of disciplinary perspective is a cornerstone of interdisciplinary analysis" (66), which is why the proposed approach is not at all intended to reflect a unity of perspective but rather to express and organize a plurality of perspectives. The underlying concept of "interdisciplinarity" states that insights from multiple disciplines are not simply added together, as defined by "multidisciplinarity," but integrated or synthesized in order to generate a superior understanding of a particular question or object of interest. Accordingly, interdisciplinary research applies theories, methods, techniques, tools, philosophical perspectives, concepts, or types of data imported from different disciplinary contexts for investigating problems whose solutions are beyond the scope of a single domain. Therefore, it is pointed out that shifting perspectives is important for both within-group and across-group communication (205):

> But while views may differ within a domain, some of the most important differences occur across domains and thus will be obscured by an exclusive reliance on domain analysis.

Consequently, the authors argue that neither pure domain-specific KOSs nor the traditional discipline-based universal KOSs are sufficient to serve interdisciplinary research, referring to a long history of criticism regarding disciplines as arbitrary constraints within the field of library and information science including theorists like James Duff Brown, Barbara Kyle, Douglas Foskett, Derek Austin, Clare Beghtol, or Nancy Williamson. As a less arbitrary organizing principle and basic schema for the main classes of a comprehensive classification, the hierarchy model of integrative levels is applied to establish a logical order of phenomena in terms of increasing complexity such as the sequence "from physical particles and molecules, through biological structures, to the most sophisticated products of human thought" (82). For example, the main classes of the *Integrative Levels Classification* rely heavily on Nicolai Hartmann's categorical analysis of levels of reality. Admittedly, one might question some internal relations of this linear level model and suggest alternative approaches that present more coherent levels of integration by taking relations of co-evolution into account, particularly between individual minds and collective culture (Kleineberg 2016). Nevertheless, the logical order inherent in integrative levels, at least if they constitute a generic or genus-species hierarchy that *per definitionem* presents *a priori* conceptual relations between classes and their subclasses, seems generally able to support interdisciplinary research by interrelating basic phenomena independently from disciplinary approaches. Based on the technique of faceted classification, such a basic schema might, in turn, serve as a reference point for the indication of different authorial perspectives that include at least (122):

- Disciplines itself (and interdisciplinarity)
- Theories applied
- Methods applied
- Epistemological outlook
- Ethical outlook
- Aesthetic attitudes
- Ideological outlook
- Rhetorical strategy.

Compared to more or less static enumerative classifications, the advantage of such a dynamic system of freely combinable facets might be seen in its ability to integrate multiple aspects without being forced to privilege one of them over another. Furthermore, it appears to be relatively easy to incorporate further relevant aspects, for example, in

terms of "dimensions of knowledge organization" (Gnoli 2016, 405) or "epistemic contexts" (Kleineberg 2013), even though the loss of useful mnemonic principles offered by more restricted faceted classifications like Ingetraut Dahlberg's (2008) *Information Coding Classification* seems to be a price that has to be paid.

A more serious concern about faceted classifications in general is raised by Birger Hjørland (2013, 545), who claims that facet analysis is based on "the problematic assumption that relations between concepts are a priori and not established by the development of models, theories and laws." Moreover, the idea to decompose complex concepts into basic concepts, as proposed by this kind of analytico-synthetic approaches, is criticized for ignoring the fact that elements might change their meaning in different contexts and that, as a consequence, "different views have much wider implications than just alternative orderings of sets of pre-established classes" (Hjørland 2013, 556).

3.0 Perspectives on perspectives

As it is usually the case with long-standing debates, each party seems to hold some partial truth that should not be neglected. Therefore, it might be worthwhile to have a closer look on the different views on the concept of viewpoint itself since different perspectives on the meaning of perspectives might lead to different but not necessarily contradictory emphases with regard to conceptual ordering systems.

Some examples should illustrate this point. In his critique of universal classifications, Hjørland (2008) stresses that descriptions of objects are purposeful and theory-laden since they are made from a particular perspective. For instance, chemicals might be described by chemists in terms of their structural properties, whereas pharmacologists would describe them in terms of their medical effect. Likewise, there might be disagreement of how to classify mental disorders (Hjørland 2010). This kind of disagreement, Hjørland claims, is closely related to Thomas Kuhn's famous thesis of incommensurability, and he concludes that phenomena (or a document dealing with them) should be described within the domain-specific framework of a particular user group. Therefore, Hjørland's (1997, 95) version of comprehensiveness can only be achieved by a kind of bottom-up approach to the plurality of perspectives:

> If many libraries' different subject descriptions of this book are merged in one database (a union catalog), this book would be visible from many different epistemic interests. This would be an ideal situation.

In opposition, the authors of *Interdisciplinary Knowledge Organization* advocate a kind of top-down approach by organizing such "epistemic interests" in the first place. They argue that, for example, chemists and pharmacologists would not *per se* disagree about the structural properties or medical effects of chemicals; whereas, both of them might benefit from a shared general classification that allows them to take each other's perspectives. In a comprehensive phenomenon-based and faceted classification, chemicals would be classified according to their constitution and structure in terms of levels of reality, located higher than subatomic particles and lower than cells, while their medical effects would be indicated by a facet of causal links (Gnoli and Szostak 2009). Likewise, mental disorders would initially be defined and classified with respect to symptoms and then linked to several facets like causes or effects. From this point of view, much of the ambiguity can be handled by distinguishing phenomena, relations between phenomena, and authorial perspectives.

However, the crucial question remains as to what extent phenomena or their descriptions are incommensurable in the sense suggested by Kuhn (1970). As a historian of science, he was primarily interested in the diachronic dimension of scientific revolutions and their implicit paradigm shifts, for example, between Aristotle's, Newton's, or Einstein's views on the natural world. Therefore, the incommensurability thesis might work much better for the historical dimension of phenomenon interpretation or subject description that has come into focus recently (Buckland 2010; Tennis 2002). In *Interdisciplinary Knowledge Organization*, it is acknowledged that in the course of history, human knowledge of phenomena changes and might become more precise, for example, if one compares the ancient concept of "air" as a primary substance together with fire, water, and earth, with the modern one as a compound of nitrogen and oxygen. But the authors simply conclude that "while the phenomenon is still there, it is now better placed within the system of knowledge" (155). In other words, historical paradigm shifts and the resulting incommensurable views on a phenomenon (or as one might prefer: incommensurable phenomena occurring in different views) remain undifferentiated if they are all classified according to the recent view, a unity of perspective which the authors seek to avoid. Instead, one should ask in which way this plurality of different frames of reference, might they be called paradigms, semantic fields, language games, epistemes, or worldviews, can be made visible and organized in a meaningful way. Although the authors acknowledge that Tennis's (2002) epochs of knowledge or Kleineberg's (2013) levels of knowing seem to be promising in this regard, there is not much theorizing about how knowledge organization systems should deal with, for example, out-of-date phenomena (e.g., witch, phlogiston, ether) or the simultaneity of the non-simultaneous in cases where traditional, modern, or post-modern views confront each other in recent discourses on

the "same" phenomena (for example, on the question what a "phenomenon" actually is).

In order to distinguish perspectives that are more or less commensurable (Szostak's, Gnoli's, and Lopéz-Huertas's emphasis) from perspectives that appear to be incommensurable (Hjørland's emphasis), philosopher and developmental psychologist Zachary Stein (2007, 92) offers a helpful analytical framework for evaluating interdisciplinary endeavors in which a distinction is made between "levels-of-analysis issues" and "perspectival issues." Levels-of-analysis issues mean that there are different valid descriptions and explanations of phenomena that, notwithstanding, share the same basic perspective like the recent scientific worldview (e.g., physics and biochemistry; comparable to our case: chemistry and pharmacology). In contrast, perspectival issues are concerned with different types of validity claims (e.g., sciences versus humanities) or different degrees of complexity (e.g., cognitive competencies; comparable to our case: ancient and modern concepts of air) that represent fundamentally divergent basic perspectives. According to this view, one might conclude that the strength of *Interdisciplinary Knowledge Organization* is to offer a theoretical foundation for a comprehensive KOS that is able to deal with levels-of-analysis issues, which still belong to the most important challenges of interdisciplinarity; whereas, a weakness remains with regard to some fundamental epistemological questions, even though the authors frequently underline that the organization of knowledge should be pragmatically rather than philosophically strong.

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