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Modeling the aesthetic axis of information organization frameworks, part 1

Theoretical basis

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Abstract

Purpose – The purpose of this paper is to propose a theoretical framework, based on contemporary philosophical aesthetics, from which principled assessments of the aesthetic value of information organization frameworks may be conducted.

Design/methodology/approach – This paper identifies appropriate discourses within the field of philosophical aesthetics, constructs from them a framework for assessing aesthetic properties of information organization frameworks. This framework is then applied in two case studies examining the Library of Congress Subject Headings (LCSH), and Sexual Nomenclature: A Thesaurus.

Findings – In both information organization frameworks studied, the aesthetic analysis was useful in identifying judgments of the frameworks as aesthetic judgments, in promoting discovery of further areas of aesthetic judgments, and in prompting reflection on the nature of these aesthetic judgments.

Research limitations/implications – This study provides proof-of-concept for the aesthetic evaluation of information organization frameworks. Areas of future research are identified as the role of cultural relativism in such aesthetic evaluation and identification of appropriate aesthetic properties of information organization frameworks.

Practical implications – By identifying a subset of judgments of information organization frameworks as aesthetic judgments, aesthetic evaluation of such frameworks can be made explicit and principled. Aesthetic judgments can be separated from questions of economic feasibility, functional requirements, and user-orientation. Design and maintenance of information organization frameworks can be based on these principles.

Originality/value – This study introduces a new evaluative axis for information organization frameworks based on philosophical aesthetics. By improving the evaluation of such novel frameworks, design and maintenance can be guided by these principles.

Keywords Evaluation, Research methods, Analysis, Bibliographic systems, Indexes, Retrieval languages

Paper type Research paper

1. Purpose

Designing, building, and maintaining an indexing language, metadata schema, or ontology is an act of creation. In both the act and the artifact we can examine the form and content through a number of different lenses. We find an incipient discourse within

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information science (IS) that views such objects through an aesthetic lens, making judgments based on a conceptualization of what is a beautiful indexing language, metadata schema, or ontology. We can consider indexing languages, metadata schemas, and ontologies generally as knowledge organization systems (KOS), yet coupled with their localized history and in their particular contexts we name them information organization frameworks (IOF). For example a localized Dewey Decimal Classification is not the same as the schedules, yet both are KOS if we only consider the structure. To highlight the contingencies and variation we will use IOF from here forward.

We find an incipient aesthetic discourse in Richardson (1964), Mai (2000), Gorman (2007), Andersen (2008), Tennis (2008), and Feinberg (2011). While Tennis calls for an aesthetic perspective on the craft of information organization work, Andersen (2008) alone calls for such an aesthetic judgment. He says, "Aesthetics, then, brings a new dimension to knowledge organization theory (knowledge design theory); a dimension that provides knowledge organization theory with a view that sees knowledge design as creative digital art" (p. 274).

This calls us to the problem that aesthetic judgments of IOFs may be explicit or implicit. When such judgments are implicit, they often can be seen to interfere with the evaluation of IOFs according to other, explicit criteria, such as economic feasibility, functional requirements, or user-orientation. In order to understand better how aesthetic judgments may or may not interfere with judgments of economic feasibility, functional requirements, and user-orientation, we must make explicit the formulation of aesthetics with regard to IOFs.

The explicit formulation of aesthetic judgments of IOFs is impeded on two grounds. First, the incipient discourse noted previously has not yet matured into a scholarly tradition of aesthetic criticism of IOFs within IS. Second, no overarching aesthetic framework has been proposed from which such a tradition of criticism could draw its principles. The distinction between criticism and aesthetics proper is discussed further in section 2.2.1.

The purpose of this paper, then, is to propose a conceptual framework, based on contemporary philosophic aesthetics, from which principled assessments of the aesthetic value of IOFs may be conducted. To do this we identify the appropriate discourses within the field of philosophic aesthetics and operationalize them as applying to IOFs by means of an evaluative rubric. In this process, we take note of and attempt to meet incipient criticism of the project, particularly concerning cultural appropriateness. We then test the viability of this rubric by thought experiment, applying it to several existing IOFs. We finally propose this application as a potential model for principled criticism of the aesthetic axis of IOFs.

We see this project as consistent with long-standing practices within IS. First, we proceed by conceptualizing an abstract framework from which we can view IOFs. This approach has its origins in theorists like Ranganathan and Gopinath (1967), who proceeds from highly abstract ideas. It continues to be practiced by theorists such as Hjørland (1992), who uses epistemological viewpoints, based on contemporary philosophic epistemology, to provide a framework within which it is possible to evaluate practices of subject-indexing. We then test this conceptual framework by applying it to historical exemplars, selected as rich sources for testing as many aspects of the framework as possible. Again, we view this as consistent with this conceptual

approach within IS as practiced, for example by Hjørland (1992) and Mai (2001). We find this conceptual approach particularly fitting for this project, since our models in philosophic aesthetics operate at a very high level of abstraction, based on a long-established, theory-rich tradition. To proceed from an empirical basis would only repeat the work already done in the philosophic tradition we rely on here.

Our work is published in two parts. In part 1, sections 1-2, we review the background of IOFs, identify the appropriate discourses in philosophic aesthetics and formulate propositions appropriate to IOFs from them, and address incipient criticism. In part 2 (Ojennus and Tennis, 2013) we develop an evaluative rubric, apply the rubric in two case studies, and discuss the results.

2. Background

2.1 Information organization frameworks

Information organization frameworks are types established at the constellation of structures, work practices, and discourses. They are kinds of creatures in the world. For example, social tagging regimes, bibliographic control, library classification, and ontology engineering are all types of information organization frameworks. Particular instances of these types are systems (Tennis and Jacob, 2008). For example, understanding the Library of Congress Subject Headings (LCSH) as an IOF means that we consider not just the controlled vocabulary of the LCSH at a point in time, but also consider the practices that are used to introduce new headings, revise outdated headings, and the like, and the documentation that describes the principles, goals, practicalities, and the like of the LCSH.

2.2 Background in aesthetics

2.2.1 Call for application of aesthetics to information organization frameworks. The need for developing an aesthetic framework within which it would be possible to make principled judgments of the aesthetic value of IOFs can be observed in two ways. First, there is an incipient discourse that already approaches IOFs as objects bearing aesthetic properties. Second, Andersen (2008) explicitly calls for the development of such an aesthetic framework.

We observe an incipient discourse that applies aesthetics to IOFs. This discourse manifests itself in its earliest forms by considering the parallel between IOFs and works of art, literature, or other creative human endeavor, especially in that they often rely on human judgment and creativity, not simply on eternal, impersonal scientific principles. For example, Ernest Cushing Richardson describes this as:

> The classification of books is like classification of specimens in a museum: each is an art; neither is theoretically exact. If we attempt to rearrange things strictly according to likeness with scientific exactness, we have to vaporize them so that the elements may be brought together (Richardson, 1964, p. 23).

Ranganathan also acknowledges the artistic in the act of identifying relevant characteristics. Instead of relying on nature or some other more scientific claim, he tells us that the classifier can rely on genius or flair (Ranganathan and Gopinath, 1967, p. 147). Similarly, theorists of the indexing process liken indexing to an art, in that, although various techniques may be applied, it ultimately relies on more holistic, human judgments than on an impersonal technique. Jens-Erik Mai concludes:

> The reason for this [scholarly focus on technical aspects of indexing] could be that indexing has been approached as an exact skill that can be mastered, such that inter-indexer inconsistency can be eliminated. Instead, indexing must be thought of as a humanistic interpretative art (Mai, 2000, p. 295).

More recently we have seen this discourse develop in tentatively searching for a conceptual basis on which to ground such an aesthetic approach to IOFs. Melanie Feinberg, citing Andersen (2008), focusing on rhetoric, persuasion, and information systems, studied the Prelinger Library. She summarizes her conclusions:

> While the basic outcome of this study has been to advance conceptual understanding of how information systems communicate to achieve persuasive impact, the larger goal of this broader research program is to support the systematic, purposive design of information systems that forthrightly assert a specific interpretation of their subject matter. This orientation accepts the conclusion, as suggested by myriad analyses of bias in information systems [. . .] that neutrality is an untenable design goal. If information systems inevitably impose a particular perspective on their contents, then one response is to expose, clarify, and defend that position, instead of obscuring it (Feinberg, 2011). Continuing in this vein, information systems can be viewed as a means of creative original expression similar to any form of document or artistic work (Andersen, 2008) (Feinberg, 2011, p. 1034).

Feinberg's conclusions bring us to the goal of the project at hand, which, as previously, is to provide a framework, based in philosophic aesthetics, which will be useful to "expose, clarify, and defend" the personal or cultural point of view from which an IOF is created.

Second, then, we see that Andersen directly calls for the development of such a framework, suggesting already that aesthetics is the appropriate discourse from which to approach IOFs (or, in his words "knowledge organization theory") as a human creative endeavor. We quote Andersen at length, since this is a key justification for this research:

> The notion of knowledge organization as a cultural form implies that we must start to understand knowledge organization as a mode of designing and communicating culture and knowledge. Is that not what knowledge organization always has been concerned with? Yes and no. Knowledge organization has been very much concerned with communicating culture and knowledge by means of, for instance, classification systems. But knowledge organization has not been viewed as a production and aesthetic form. In new media the database form is a dominant creative production form. [. . .] Understanding knowledge organization as a cultural form, as knowledge design, invites a rethinking and a reconfiguration of knowledge organization theory and practice. Knowledge organization theory should be reconfigured along the lines of what Manovich calls "info-aesthetics" [. . .] Given that information access is a "key category of culture" (Manovich, 2000, p. 217), it is necessary to recognize the "culturalization" and "aestheticization" of knowledge organization that new media bring with it. This means our present vocabulary and approaches to knowledge organization are limited. We must engage in discussions about how and with what means knowledge is designed in new media, what actions are to be accomplished with knowledge design. [. . .] Building on Manovich's notion of "info-aesthetics", knowledge organization research as a matter of aestheticizing knowledge design activity and to understand this activity as media creation as well. Aesthetics, then, brings a new dimension to knowledge organization theory (knowledge design theory); a dimension that provides knowledge organization theory with a view that sees knowledge design as creative digital art (Andersen, 2008, pp. 272-4).

Again, we see this project as specifically responding to Andersen's call to view the form of knowledge organization as a human cultural product, and to use aesthetics as

the appropriate tool to evaluate knowledge organization objects, i.e. IOFs, since they are human cultural products. Even more specifically, we see this project as addressing the overt need to develop an appropriate language to further that discourse.

Approaching this from the other side, we find that philosophic aesthetics is a particularly amenable discourse from which to proceed in building this critical framework. Because it works at a high level of abstraction, philosophical aesthetics may be reasonably applied to objects not traditionally understood as artworks. This is an important consideration since IOFs do not have perceptual properties, such as color or form, which are the intuitive candidates for aesthetic appreciation. Rather, the aesthetic properties of many objects traditionally considered within the realm of aesthetics are not obviously bound to perceptual properties; the most obvious examples are novels and poems, whose aesthetic properties are more naturally associated with their arrangement of concepts than any sensory properties they may have (Currie, 1989).

Further, as a highly abstract discourse, philosophic aesthetics is an appropriate model for establishing the critical framework from which to evaluate the aesthetic properties of IOFs. Here it is useful to apply the distinction between aesthetics and criticism. Properly, criticism (or appreciation) is the practice that has artworks as its object of study, and aesthetics provides a second-order framework to investigate criticism. In the arts and humanities there are parallel discourses: art criticism, literary criticism, music appreciation, and the like, that assess the aesthetic properties of specific artworks, but aesthetics that addresses questions of procedure that arise within the critical discourses. That is, contemporary aesthetics serves as a philosophy of art (Levinson, 2003). This distinction is not strictly maintained, as aestheticists also engage in criticism, and critics do raise and attempt to answer second-order questions about their practice. The case of literature is also more complicated with the field of literary theory in a parallel position to aesthetics. Nevertheless, the general distinction between criticism and philosophical aesthetics is useful to describe the scope of this project. In Part 1 we establish a critical framework based on philosophic aesthetics at a highly conceptual level; in Part 2 we engage in "criticism" of specific exemplars, but our goal is not to establish canonical judgments of those exemplars, but to test and demonstrate the utility of the framework as a basis for criticism.

From the literature reviewed previously, we find an incipient discourse that likens IOFs to artworks and invites the establishment of an aesthetic framework from which to approach them as such. Whether IOFs are in fact artworks is not ultimately relevant to this project. While it is generally agreed that an "artwork" is ontologically distinct from a "non-artwork", it is also recognized that that distinction is very difficult to define absolutely (Levinson, 2003), and that aesthetic properties do inhere in non-artworks, though perhaps not in exactly the same way (Danto, 1981). Similarly, Walton prefers to push the question of the ontological status of artworks to the background and focus on representational features they share with non-artworks (Walton, 1990). However, the ontological status of an artwork is an ongoing debate in a subfield of aesthetics we find particularly relevant to the assessment of IOFs (see section 2.2.4). Here we do not wish to identify the category of "information organization framework" as a category of artwork, but rather to suggest that it is sufficiently similar to a category of artwork that analysis of an IOF as an artwork will be useful in determining its aesthetic qualities. This analysis in turn helps us assess its aesthetic value in relation to other facts like economic viability, user-orientation, and the like.

2.2.2 Information organization framework as an artwork-like category. The concept of category of artwork is foundational to our application of aesthetics to IOFs. On the one hand, the idea that individual beautiful objects are recognized as such by belonging to a particular class of beautiful objects is coextensive with systematic thought about beauty, as we can see already in Plato:

> A lover who goes about this matter correctly must begin in his youth to devote himself to beautiful bodies. First if the leader leads aright, he should love one body and beget beautiful ideas there; then he should realize that the beauty of one body is brother to the beauty of any other and that if he is to pursue beauty of form he'd be very foolish not to think that the beauty of all bodies is one and the same [. . .] *Symposium* 210a-b (Nehamas and Woodruff, 1997).

On the other hand, our particular use of this concept is derived from a much more specific discourse within modern aesthetics, namely the discourse concerned with representation or mimesis. Representation is the logical aesthetic discourse for us to appeal to, since the purpose of an IOF is to represent a body of knowledge in a principled way. Discussion of representation in philosophical aesthetics begins with Gombrich (1960) and Goodman (1968), who argue for an "empiricist" theory, that is, that aesthetic properties depend solely on perceptual properties of the work. The concept of categories of artworks was formulated to address problems apparent in the empiricist approach.

2.2.3 Contemporary discussion of categories of art. Here we review the literature in philosophic aesthetics in the specific discourse regarding the concept of categories of art, identify a dominant conception of aesthetic apprehension of artworks, and suggest how this conception can be used to identify aesthetic properties of IOFs. Before proceeding, a few notes will help clarify our approach here. First, our discussion of aesthetics draws primarily on a core group of scholars (Walton, Currie, and Levinson). We do not attempt to recreate their arguments in any detail or attempt to advance these arguments on our own. Rather, we understand that this is a dominant, stable understanding of aesthetics within the field of philosophy, though not the only understanding within that field. We address a few controversies in 2.3 that are particularly relevant to our application to IOFs, but in general we understand that the argumentation for the propositions we identify is the work of the philosophers, and our task is to propose their application to IOFs.

Second, we locate this approach in a coherent tradition within IS, which we might consider knowledge organization theory, in Andersen's terminology (2008). We see the origins of this approach in theorists like Ranganathan and Gopinath (1967) who appeals to a highly abstract framework. We locate our work in the approach taken by theorists such as Hjørland, who similarly appeals to philosophic epistemology to provide a framework within which to understand and evaluate practices of subject-indexing (1992). Other models for this approach include Mai (2001), who appeals to the philosophical model of semiotics to propose a framework for the practice of subject-indexing, and Svenonius (2004), who uses concepts from philosophical epistemology to propose an evaluative framework for knowledge representation and retrieval languages. We recognize that this is a highly specific approach within IS, where empirical approaches are often preferred; nevertheless, we find this is the appropriate approach to address the task of establishing a critical framework as called for by Andersen previously. On the one hand, our models within philosophic aesthetics work at a high level of abstraction, and, on the other, to proceed from an empirical basis would only repeat the work already done in the philosophic tradition.

Modern discussion of the importance of the concept of category of artwork begins with Walton (1970). Walton argues that aesthetic properties of artworks depend not only on their perceptual properties (e.g. how they look or sound), but also on how the artwork relates to the properties of its category. That at least some aesthetic properties of artworks do depend on their perceptual properties (even in the extended sense that, say, a narrative has perceptual properties) is taken as axiomatic. That is, the color of a painting can be perceived directly as "vivid", or a narrative can be understood directly as "exciting". The properties of a category of art are further subdivided as being either standard, variable, or contra-standard (Walton, 1970). Standard properties of a category are those which are required for it to be recognized as belonging to that category. Variable properties are those whose presence, absence, or content do not affect our recognition of the category. Contra-standard properties are those that normally prevent us from recognizing an artwork as belonging to that category (Walton, 1970). For example, in the category "painting", standard properties are that paintings are flat and motionless, variable properties include the subject represented, and contra-standard properties might be extension in three dimensions or motion.

Recognition of the category to which an artwork belongs affects our judgment of aesthetic properties in several ways. First, the presence of individual standard properties is seen as non-exceptional. In our example of painting, once we have recognized an artwork as a painting, we do not treat the flatness of the painting as having aesthetic content (e.g. it is not making a statement that the represented subject lacked "depth"). Second, close approximation to the standard features of the category, produces a particular effect of "order, inevitability, stability, or correctness" (Walton, 1970, p. 348). Third, we view variable properties within the scope of variation allowable for that category. Again, of a painting, we make the judgment that it is "bright" not in absolute terms (e.g. compared to the sun), but that it is bright compared to other paintings. In some cases, there is a "correct" category within which to perceive a given artwork; perceiving it in terms of a different category results in a mistaken aesthetic judgment (Walton, 1970). This becomes an important point when we consider the applicability of the theory from one culture to another (that is, the concept of category of artwork provides an alternative to appealing to universal standards; we discuss this further in section 2.3). Fourth, presence of contra-standard features, if they are sufficiently limited that they do not interfere with the recognition of the artwork as belonging to its nominal category, may have aesthetic value, especially being perceived as creative solutions to an artistic problem, or as expanding our concept of the category. Walton uses the example of Wagner's Tristan and Isolde as using harmonies not standard to contemporary understanding of traditional Western harmony, but to a limited extent such that they do not interfere with our understanding of the work as essentially tonal. These contra-standard features then have aesthetic value as being "unsettling" and therefore elegantly conveying Tristan's unsettled psychological state (Walton, 1970, pp. 352-4).

From Walton's discussion we understand the following key propositions:

P1. Some aesthetic properties depend simply on perceptual properties.

P2. Certain aesthetic properties depend on a close approximation of the standard properties of the relevant category.

P3. Judgments of aesthetic properties that are variable properties of the relevant category are to be made according to the range of variation in that category.

P3a. For a given work, there may be a correct category within which to perceive it.

P4. Certain aesthetic properties may depend on use of contra-standard properties, as long as they do not interfere with the recognition of the nominal category.

These propositions establish the core of the aesthetic model we mean to apply to IOFs. When we consider further developments of this discourse within aesthetics, it will be necessary to refine these propositions or expand them to meet additional considerations. We may then briefly foreshadow this application. For a given IOF we may assess aesthetic properties:

P1. From perceptual (see discussion immediately following) properties. For example, the terms chosen to represent concepts may be particularly "fine" or "apt", or the distribution of terms may be particularly "even" or "balanced".

P2. From the proximity of the perceptual properties to the standard properties of the category of the IOF. For example, an IOF that closely adheres to its ISO/NISO standard may be considered more "orderly" or "stable" than one that deviates from the standard.

P3. Only within the range of variation available within the category of the IOF. For example, the level of hierarchy within an index may have a particular effect (e.g. "directness" vs "convolution") depending on the number of levels applied, but this would not be an appropriate kind of judgment of a biological taxonomy, which is always highly hierarchical.

P3a. Only when the correct category is identified. In the case of IOFs, the appropriate category will typically be selected as part of the design process, and many will explicitly state the category or standard to which they appeal. Lack of clarity of the category of an IOF (e.g. inclusion of hierarchical relationship in a subject-heading list) complicates the apprehension of aesthetic properties depending on the relationship between the IOF and its category.

P4. From the judicious use of contra-standard properties. For example, if an IOF intended to be deployed in a hyperlinked environment is following a standard originally intended for use in a print environment deviates from that standard to take advantage of the new environment this may be considered a "creative" or "elegant" solution.

As discussed previously (section 2.2.1) "perception" is not a particularly apt description of apprehension of IOFs, which are apprehended intellectually in the first place, but we tentatively retain its use here in the sense of "direct apprehension" (as opposed to the more specific sense "sensory apprehension") to clarify the relationship to this set of properties as discussed in philosophical aesthetics, and to clarify the distinction between direct apprehension and apprehension mediated, for example, by recognition of the work's category. We now go on to build on Walton's properties taking into account further developments in the field of aesthetics.

2.2.4 Development of non-perceptual aesthetic properties within the ontology of art. A number of difficulties entailed by Walton's concept of categories of art are developed by other scholars working within the discourse of aesthetics known as "ontology of

art"; the key approaches here are those of Currie (1989) and Levinson (1996). The discourse of "ontology of art" addresses the question of what sort of thing an artwork is (Levinson, 2003). Not all aspects of the ontology of art are relevant to our discussion, as we discuss further in section 2.2.5. We do find relevant those discussions of the ontology of art that address what non-perceptual properties of an artwork may have aesthetic properties depend on them.

In exploring this issue, we see Currie's (1989) *An Ontology of Art* as the most important development of Walton's work. Currie's theory has not gained universal acceptance within the field of aesthetics; see, for example, important criticisms by Howell (2002a, b) and Davies (1999). Nevertheless it remains an important and central theory of the ontology of art (Levinson, 2003), and many of the contested features do not affect our application of the theory to IOFs. Currie proposes and defends two key hypotheses. The instance multiplicity hypothesis (IMH) states that "all kinds of works are multiple: capable, in principle, of having multiple instances. In principle it is possible for there to be as many instances of a painting as there are instances of a novel" (Currie, 1989, p. 8). The IMH remains contentious (Levinson, 2003), but this does not concern our application of Currie's theory to IOFs; no one would argue that the original autograph copy of an IOF (if such a thing exists) had a superior ontological status to any other instance of that IOF. In practical terms, the print edition of *Dewey Decimal Classification and Relative Index,* 23rd ed. and WebDewey are equally manifestations of the same IOF, and have the same aesthetic properties. Aesthetic and other properties of their interfaces may vary, but that is a different question than the aesthetic properties of the IOF itself. (Note that this allows consideration of a local interpretation of an IOF as a new work worthy of its own aesthetic analysis. For example Vancouver Public Library for a time operated with three different versions of the Dewey Decimal Classification and the Kinsey Institute for Sex Gender, and Reproduction Research has penciled in changes to its original 1974 nomenclature. It is beyond the scope of this paper to consider such particular instantiations, but they are exemplary candidates for future research on the IMH).

Currie's other key hypothesis is the action type hypothesis (ATH), which states that "A work of art is [...] an action type, the tokens of which are particular actions performed on particular occasions by particular people. The things which are the natural candidates for being regarded as the instances of a work – copies or performances – are not tokens of the type which is the work" (Currie, 1989, p. 7). This requires further explanation. According to Currie, the aesthetic properties considered here do not inhere in the art object (e.g. the painted canvas, the sequence of sounds in a symphony, the sequence of words in a novel, etc.). Some aesthetic properties that depend on perceptual properties may inhere in the object, as understood in *P1*, but what is at stake here is the status of non-perceptually dependent aesthetic properties. Rather these aesthetic properties inhere in the action that creates the art object. The art object is a means to recovering the aesthetic properties dependent on its creation. Currie names the process of creation an "action type", since it is (at least theoretically) possible that the same process of creation could be carried out by different agents in different times and different places; these alternate performances of creation are then "tokens" of the "action type" that is the artwork. (Part of Currie's insistence on the type-token model is to allow the theory to encompass different levels of performance. For example, the composition of Beethoven's Fifth Symphony is an action type that has only one token, namely Beethoven's composition of it in 1804-1808; the performance of

Beethoven's Fifth Symphony is an action type that has many tokens. At this time we are only concerned with applying the ATH to the construction of an IOF.) Thinking of a work as an "action type" is a particularly apt way of considering IOFs, since we consider work-processes an integral part of the IOF, not simply the end product (e.g. controlled vocabulary).

The ATH understands that there are two domains of an artwork on which aesthetic properties may depend, its structure and its heuristic. By "structure" Currie means the pattern of shape and color on a canvas, the sequence of sounds in a symphony, the sequence of words in a novel, or the like. The structure of an artwork is taken as a necessary but not sufficient condition for establishing correct instances of the work (Currie, 1989). Though we follow Currie specifically here, we note that Levinson takes a very similar approach, identifying both a tonal/verbal structure and a creator in historical context as relevant to aesthetic judgments (Levinson, 1996). Again, "structure" is an apt way to describe the manifestation of an IOF. Currie's concept of structure here is analogous to the structure of an IOF as described by Tennis and Jacob: "the structure [. . .] instantiates both the discourses underlying the framework and the work practices that make it visible" (Tennis and Jacob, 2008). We may thus rephrase proposition no. 1 (what we will label *P1*):

P1. Some aesthetic properties may depend simply on the work's structure.

The second domain on which aesthetic properties may depend is the work's heuristic. The work's heuristic refers to all the relevant historical and cultural data that explain how the artist arrived at the work's structure. Currie elaborates:

> It is to help us to understand, by means of historical and biographical research, the way in which the artist arrived at the final product. He [the critic] must show us in what ways the artist drew on existing works for his inspiration, and how far that product was the result of an original conception. He must show us what problems the artist had to resolve in order to achieve his end result, and how he resolved them (Currie, 1989, p. 68).

We can see then, that *P2*, *P3* and *P4* are comprehensible in terms of the work's heuristic. The necessity of appealing to heuristic as well as structure is well described by Danto:

> Imagine that we learned that the object before us, looks like a painting that would spontaneously move us if we believed it had been painted – say the *Polish Rider* of Rembrandt, in which an isolated mounted figure is shown midjourney to an uncertain destiny – was not painted at all but is the result of someone's having dumped lots of paint in a centrifuge, giving the contrivance of a spin, and having the result splat onto canvas, "just to see what would happen." And what happened is that, by a kind of statistical miracle, the paint molecules disposed themselves in such a way as to produce something to all outward appearances exactly like one of the deepest paintings of one of the deepest artists in the history of the subject [. . .] (Danto, 1981, p. 31).

Danto's point is, of course, that the *Polish Rider* and its identical paint-splotch have different aesthetic properties, despite the fact that they have identical structures. The difference in their aesthetic properties, then, depends on the difference in their heuristic. A category of art's heuristic is the set of circumstances surrounding how they came to be. Since any work of art is created within a certain category, its instantiation of that category is a relevant element of its heuristic.

Returning to the propositions gathered from Walton, we may generalize *P2* to apply to IOFs, which similarly appeal to a pre-existing category or standard. For ease of reference, we will refer to this element of the heuristic as invocation, that is, an artist or creator of an IOF "invokes" the category that his work is to be understood within. (Both Walton and Currie find that artistic intention is not sufficient to guarantee appeal to the correct category (Walton, 1970; Currie, 1989). We do not discuss the details of this problem, and consider intention to be normally sufficient to identify the category of an IOF. That is, we can assume that IOFs are intentional interventions, and it is not normally necessary for information scientists to allow for the category of "found art" as it would be in art criticism.) An example of invocation in IS would be where the TF/IDF (term frequency-inverse document frequency) value may be understood differently depending on the algorithm used to compute it (raw, Boolean, logarithmical, etc.). We define invocation as "reference to the category in which a work is to be understood or appreciated, normally determined by the creator's intention". We may thus rephrase *P2*:

P2. Certain aesthetic properties depend on the work's invocation.

Again, the range of variation within a category is part of the historical reality in which the artist works and part of the artistic problem he sets himself to solve, and, therefore, part of the heuristic. Again we may generalize this proposition to apply to IOFs, which are similarly created at historical moments and with limits on variation imposed by the techniques available. A pair of illustrations may help clarify this point. On artistic variation, Walton suggests the example that a passage played on the piano will be perceived as "fast" or "energetic", but will not be so perceived when the same sequence of notes is generated by a computer because, in the former case, we recognize it as approaching the limits on speed imposed by the physical structure of the instrument and the technique available to a human player, where in the latter case we recognize those limits do not apply (Walton, 1970). Currie accepts this basic insight, but expands it, demonstrating that category alone is not sufficient to establish the context within which aesthetic judgments may be made (Currie, 1989). For the sake of clarity, we continue to address the context delimited as "category" here, and address other aspects of context later. Levinson also argues for the centrality of the historical context in forming aesthetic judgments (Levinson, 2002). We can imagine the same principle applied to IOFs. For example, the rule in the Subject Headings Manual on number of headings that "Generally a maximum of six is appropriate" and that in LC practice "Do not assign more than ten headings to a work" (Library of Congress, 2008, H 180.3), can be understood as "expressive" if we understand this to have been formulated in reference to a card-cataloging environment, but "severe" if we understand it to have been formulated in a hyperlinked environment. For ease of reference we refer to this as the "context of variation". We may rephrase *P3*:

P3. Judgments of aesthetic properties depend on the context of variation.

We show previously that it is necessary to refine this proposition, in that, for a given artwork, there may be more than one category within which its aesthetic properties may be determined; for a proper aesthetic judgment, it is necessary first to determine the work's correct category. Currie develops this idea; he argues that determination of the correct category is dependent on the larger context of production (Currie, 1989). That is, the determination of the correct category is part of the work's heuristic. In the

case of an artwork, the clarity of the appropriate category may entail various aesthetic properties, e.g. an artwork that labors over its clarity may come across as "ersatz" or "derivative", while one that cleverly defies determination may be taken to make a subtle point about the categories themselves. In the case of an IOF, the situation will normally be simpler, with a clearly manifest category entailing properties such as "lucid". For ease of reference we refer to this as "accessibility of category". Given this perspective, we can rephrase this refinement (previously listed as *P3a*) as an independent *P5*:

P5. Certain aesthetic properties may depend on accessibility of category.

We saw earlier that Walton allowed aesthetic properties to depend on contra-standard properties, as long as the work's category was not obscured. Currie develops this in two ways. First, use of contra-standard categories, whether or not they obscure the work's category may be taken as evidence that the artist is working to solve an artistic problem or develop a new technique, or even a new category. As such they can be taken as evidence of the level of creativity involved in the process, and thus have aesthetic properties depend on them. Currie's example clarifies:

> Consider, first of all, the case of Picasso's *Les Demoiselles d'Avignon*, a picture that is often said to be the first Cubist painting. But though the work is highly valued for its originality, many have been critical of certain features of the work. Critics have described the composition as "hasty and confused" and involving "stylistic inconsistencies". But the work's greatness is recognized at the same time, and this recognition is partly dependent on the recognition that, with this work, Picasso was struggling to bring forth a new conception of representational painting (Currie, 1989, pp. 34-5).

We see the same principle as applicable to IOFs; an IOF that does not conform to its standard, or whose standard is unclear, may be judged as "unclear" or "inconsistent", but it may at the same time "elegantly" solve a problem that the acknowledged standards do not. For example, within the context of folksonomies in social tagging sites, we see evaluative tags, and these deviate from most regimes of indexing. For ease of reference we refer to this deviation from category to solve a problem or take advantage of a new technique as "origination". Leaving aside the second development for the moment, we may rephrase the proposition:

P4. Some aesthetic properties may depend on the work's origination.

Second, Currie expands Walton's taxonomy of "standard, variable, and contra-standard" properties to encompass the artistic tradition the artist is working in. Thus, not only are the "rules" of the category relevant for determining the work's context, but anything the artist knows or might be expected to know about the tradition, the broader cultural context of the artist, and even more broadly the potentials and limits of the human condition (Currie, 1989). Previously we noted this move to abstraction from "category" to "context" in Currie's development of Walton, but chose to retain the concept of "category" because of its usefulness in operationalizing the much more abstract notion of "context". The concept of "category" also has special usefulness in assessing the non-perceptual properties of IOFs, since many IOFs are explicitly designed with a certain standard in mind. Here, then, it is necessary to address elements of the context of the work's production not covered by the concept of category. Currie does not systematically develop the further elements beside "category" that make up "context", but suggests

some general areas as level of development of the tradition in which the artist is working (e.g. ability to use formal perspective is a minor accomplishment today, but a major breakthrough in the fourteenth century), historical context (e.g. presence of limiting factors imposed by culture, politics, or realities of production that the artist worked around), and the context of human possibility (Currie imagines Martian toddlers whose scribbles are technically superior to any human artwork, but argues they are not aesthetically superior because they must be judged according to what is possible for the artist). Again, historical context is a central tenet in Levinson's approach as well (Levinson, 2002).

We see two applications of this general idea as being particularly apt (or useful) to the case of IOFs. First, the historical date and/or level of development of the particular approach to information organization should be taken into account in assessing the achievement of an individual IOF. For example, we should consider whether the IOF uses or imitates the best practices established by similar frameworks, simply repeats the achievements of other frameworks, builds on them, or breaks new ground altogether. For example, we might consider constraints or innovations in relation to information organization. For ease of reference we refer to this as the work's "historical context". Thus we may add the proposition:

P4. Some aesthetic properties may depend on the work's historical context.

Second, the human cultural context and the context of what is humanly possible should be taken into account in assessing the achievement of an individual IOF. (Levinson approaches this idea of cultural context in the agent (signified by X) and time (signified by *t*) in his definition of a work: S/PM structure-as-indicated-by-X-at-*t* (Levinson, 1980); "agent" is, however a less appropriate way to mark context in the case of IOFs). Here several different ideas are relevant. First, we should consider the achievement in establishing a framework that is accessible to its target audience on a cultural level. We understand this on both the level of national culture and the culture of an academic discipline. For example, an aristocratic culture (e.g. nineteenth century England) and a democratic culture (e.g. twenty-first century United States) presumably have different predispositions to a highly hierarchical IOF; the development of an IOF in either cultural context that addresses that predisposition is part of its aesthetic achievement. *Mutatis mutandis* indexes of scholarship in physics and French literature have opportunity for aesthetic achievement in addressing the different cultural contexts of those disciplines. Second, we should consider the achievement in terms of what is humanly possible. It is not necessary to invoke Martian toddlers of preternatural intellectual capacity to imagine that some IOFs approach the limit of human possibility, while others do not. For example, we can appreciate the Library of Congress Subject Headings (LCSH) as "monumental" in terms of approaching imaginable human limits of comprehensiveness. For ease of reference we refer to this as the work's "cultural context". We may thus add the proposition:

P6. Some aesthetic properties may depend on the work's cultural context.

Now that we have outlined some useful propositions taken from philosophical aesthetics we intend to apply to IOFs, it is necessary to acknowledge that there are a number of further discourses within philosophical aesthetics that potentially impinge on this project, but which are outside the scope of this paper to address directly.

2.2.5 Limits of scope in appeal to philosophic aesthetics. In appealing to philosophic aesthetics to establish a framework for assessing aesthetic properties of IOFs we have narrowly focused on the discourses concerning representation and the ontology of art. This is by no means exhaustive of the variety of discourses within philosophic aesthetics. As summarized by Levinson (2003), these discourses may be roughly divided into three foci, which he labels "art", "aesthetic property", and "aesthetic experience". Of these three foci, we address only the first, since, as discussed previously, our purpose is to investigate how we may assess an IOF as if it were an artwork (i.e. as a bearer of aesthetic properties). Although we refer to the concept of "aesthetic properties" in the previous discussion, we do not address this focus of discourse within philosophic aesthetics, which addresses questions of what the nature of an aesthetic property is and how individual properties (e.g. "beauty") are to be defined. We recognize that these are potentially relevant questions in assessing the aesthetic properties of IOFs, but they lie outside the scope of the current discussion.

Similarly, we do not propose to address the debate between "aesthetic realism" and "anti-realism", although this ultimately impinges on the concept of aesthetic property, which we do employ. Aesthetic realists hold that aesthetic properties are existent entities that can be apprehended; the existence of these entities allows judgments about artworks to be objective in some sense (Zangwill, 2003). Anti-realists hold that aesthetic judgments are inextricable from the taste of the judge, and that this accounts for the differences in aesthetic valuation between equally competent judges (Bender, 2003). Although, historically, philosophical aesthetics has been conducted from a realist position, this continues to be an ongoing debate, as Schafer discusses (2011). Assuming a background of aesthetic realism provides a sounder foundation for this project, since our goal is to provide a framework within which to arrive at (more-or-less) objective aesthetic evaluations of IOFs. However, we do not see the establishment of a realist background as critical. Rather, for the purposes of this study we approach the literature and instantiations of IOFs (library classification, boundary infrastructures, and social tagging), from a neo-pragmatic perspective. Looking to Rorty's discussion of the kind of knowledge social science should create, we follow his epistemological line of reasoning, and have made usefulness the criteria for our statements (Rorty, 1982). We hope that the findings from this research will create a vocabulary that will help us cope with the social world, specifically the social world of IOFs – their similarities, differences, and various criteria for usefulness. This approach has been acknowledged as a fruitful path in LIS (Sundin and Johannisson, 2005).

Within the focus of "art", Levinson (2003) similarly divides the discourses between "form", "expression", and "representation". Among these we address only the last as being the appropriate discourse from which to address IOFs. An IOF is a representation of the structure of information within a given field; therefore it is the manner of that representation that is subject to aesthetic scrutiny. The content (i.e. "expression") of the IOF is determined by its functional requirements. That is, an IOF is created to provide access to a certain body of information for a certain user group; it is not in this way parallel to an artwork where conception of the subject or content to be expressed is in the hands of the artist. Similarly, the discourse concerning form is not of obvious applicability to IOFs. In its severe formulation, this discourse considers only perceptible properties of artworks, but, as discussed previously, we find that perceptible properties of IOFs are only one of a number of classes of properties on

which aesthetic properties may depend. Thus we focus on the discourse concerning representation.

2.3 Criticism entertained

2.3.1 A criticism of the application of "invocation" as an aesthetic criterion for IOFs. When an earlier version of the previous aesthetic framework was shared at conference talks (Tennis, 2007, 2010), it was suggested that the presented criteria, especially that of "invocation" may be too culturally specific to serve as a universal framework for assessing the aesthetic properties of IOFs. More precisely it was considered an essentially "Hellenic" conception of aesthetics (Campbell, personal communication). We will explore the implications of this criticism and consider whether the approach discussed previously addresses these implications.

The first implication of this criticism appears as being that the concept of "invocation" relies on an idealist-objectivist paradigm of the Platonic kind. That is, that the category which the IOF aspires to instantiate is taken to be prior to the IOF and that it is objectively existent (We understand this to be logical priority rather than temporal priority; the point being not that the category is taken to be described prior to its instantiation in a work, but that the category is taken to be ahistorical, that is, eternally applicable, whether or not it has any instantiations). On this understanding the criticism questions the tenability of the idealist-objectivist paradigm in the first place (*I1a*), and suggests that the assumption of ideal categories such as social tagging regimes, bibliographic control, library classification, and ontologies is a misreading of historical Anglo-American traditions (that is the traditions establishing the various knowledge organization categories) as logical necessity (*I1b*). That is, even if we assume the existence of Platonic-form like categories of IOFs, we should not assume that because there is a NISO standard for construction of thesauri that it predicates the existence of a Platonic-form like category of "thesaurus", or, that if such a thesaurus category does exist that the NISO standard describes it, or, that if the NISO standard does describe the thesaurus category that we can know that it does.

The second implication is that the whole concept of the IOF's heuristic is unnecessary (*I2*). That is, that "something, just as it is, can be considered beautiful" (Campbell, personal communication).

The third implication is that the process of assessing an IOF in terms of its heuristic presupposes an essentially static aesthetics that is founded on Hellenic ideals, which, again, should not be confused with logical necessity (i.e. that Currie's aesthetic theory is historically and culturally contingent, not ahistorical). This implication claims that we proceed from an assumption that the work (conceived as an action-type or otherwise) precedes appreciation of it as a work, that the process of appreciation is to reveal properties that the work already possesses (*I3a*). This conception of art is taken to be specifically Aristotelian and, as such, may not be appropriate to non-Western cultural traditions, and, indeed, may be questioned whether it is always appropriate within the Western cultural tradition. Implicit within this implication is that an alternative, kinetic, model needs to be incorporated within our framework (*I3b*).

2.3.2 Response 1: conceptual analysis. We will address these implications first on the level of theory, and then briefly examine two non-Western aesthetic models to see whether they are radically incompatible with the framework laid out previously. We

consider that *I1a*, *I1b*, and *I2* do not seriously apply to the framework as it is described here. *I3a* and *I3b* offer a more substantial theoretical challenge to the framework.

I1a, that the concept of "invocation" relies on an idealist-objectivist paradigm of the Platonic sort does not employ an appropriate understanding of the framework. Walton and Currie's theories that we draw on here are better described as "historicist" (Levinson (2003) uses the label "historicistcontextualist" for this group of approaches (p. 17)). Categories are explicitly conceived not as eternal verities, but as historical constructs. Currie (1989) does not so much speak of "categories" as "what artistic conventions and limitations the artist was accepting" (p. 39). We find it useful to accept Walton's concept of "category" as an important set of these "conventions and limitations" because the conventions and limitations of IOFs are, at the moment, readily recognized according to a number of categories, many of which are highly formalized (e.g. by ISO or NISO standards). Moreover, invocation (i.e. as *P2*) is neither a necessary criterion (as defined previously only "certain" aesthetic properties depend on it) nor a privileged one (it is only one of seven key propositions). We find Walton's argument that a certain set of aesthetic properties depend on a close approximation of a work's category (e.g. orderliness, cohesiveness, inevitability), but many other aesthetic properties are indifferent to this relationship.

I1b, that assumption of access to ideal categories confuses cultural tradition with logical necessity or universal application similarly misunderstands the role of the concept of invocation within the framework. First, again, we do not hold that categories are objective ideals, but rather historical constructs which are nevertheless readily recognizable. Second, setting the question of the appropriate paradigm aside, *P2* as stated here does not specify any certain set of categories which are to be taken as the sovereign set of categories against which IOFs are to be measured. It only posits the concept of category as a useful way to operationalize assessment of the relationship between an IOF and the tradition within which it is created. In such cases where there is not an appropriate category within which to assess an IOF, the framework does not disqualify the IOF from consideration, it only states that the aesthetic properties particular to invocation cannot be assessed in this way (In a similar way Scarry tries to divorce what she sees as the key aesthetic response, i.e. the search for a precedent, from its often assumed entailment that there must be some eternally prior, ideal beauty to which the beautiful object refers: "What happens when there is no immortal realm behind the beautiful person or thing is just what happens when there *is* an immortal realm behind the beautiful person or thing: the perceive is led to a more capacious regard for the world. The requirement for plenitude is built-in" (Scarry, 1999, pp. 47-8).)

I2, that the work's heuristic or context of creation is unnecessary, can be addressed on several levels. First, the framework as presented here allows that some aesthetic properties may depend on the work's structure (*P1*). Thus, some works may have the property of "beauty" simply dependent on their structure without reference to the work's heuristic at all. (Logically, such aesthetic properties are ones that depend on the work's form, such as "balance", "proportion", and the like; whether "beauty" is such a property is an open question, one that belongs to a discourse on aesthetic properties, and not within the scope of this investigation.) This approach seems to meet the objection as formulated. Second, we can understand this implication as referring to an "empiricist" ontology of art, i.e. one that holds that all aesthetic properties depend solely on the perceptual properties of the work. In this case, we find that Currie (and

others working in the same tradition) has shown that such a position is counterintuitive at best and incoherent at worst. We do not intend to repeat Currie's arguments here (see Currie (1989), pp. 17-40). Third, Currie argues that some aesthetic properties may be apprehended directly if there is no ambiguity as to which category they should be interpreted through: "A work will be dynamic simpliciter if it is dynamic for a K, for every category K to which it belongs" (Currie, 1989, p. 34).

I3a, that the framework presupposes a static view of the work, that aesthetic properties depend either directly on the work (i.e. its structure) or at one remove (i.e. on its structure as understood in terms of its heuristic), and that appreciation of these properties is the process of revealing pre-existent properties, is a reasonable characterization of the framework. As such, the framework is liable to the entailments of that implication, that this is a specifically Aristotelian conception of art (and criticism, for that matter), and is therefore not universal. This is a serious consideration, and has been paralleled in discussion of Currie's theory (Howell, 2002b). This implication, then, is bound up with the idea of aesthetic realism. As noted previously, aesthetic realism holds that aesthetic properties are existent things that inhere in artworks. This is contrasted with anti-realism, which holds that they essentially depend on the taste of the critic, and are therefore created in the process of viewing (hearing, reading, etc.). Again, as noted previously, we are agnostic in regards of aesthetic realism, but hold the pragmatic position that, even if it is not a universal truth that aesthetic properties are objective entities that inhere in works, this is still a useful perspective from which to consider them. We recognize that this is not a comprehensive response to this implication, but also that a comprehensive response to this essentially philosophic problem is outside the scope of this paper.

I3b, that in response to the cultural embedded-ness of our framework, we should incorporate alternative models, such as a "kinetic" model of appreciation, is also a serious consideration. We understand this also to be a meta-theoretical concern. That is, aesthetic responses are traditionally understood in terms of revelation, not movement. Levinson describes the traditional position on aesthetic experience as "disinterestedness, or detachment from desires, needs and practical concerns; non-instrumentality, or being undertaken or sustained for their own sake; contemplative or absorbed character, with consequent effacement of the subject; focus on an object's form; focus on the relation between an object's forma and its content or character; focus on the aesthetic features of an object" (Levinson, 2003, pp. 6-7). That is, it is a question of whether a kinetic response to the IOF would be an aesthetic response at all. Again, because this is a meta-theoretical question and because it impinges primarily on the focus of aesthetic experience, we consider further discussion to be out of scope for this paper, but an engaging concern for future research.

2.3.3 Response 2: pragmatics. Since we consider the implication that this framework is culturally bound defensible in pragmatic terms, we will attempt to show that non-Western aesthetic standards can be understood in its terms. We will briefly describe the aesthetic standards of *wabi-sabi* and *mono no aware* and then consider how they might be interpreted in terms of the seven key propositions introduced previously.

Wabi-sabi is a distinctly Japanese conception of aesthetics that is based on the observance that all things are impermanent, all things are imperfect, and all things are

incomplete. Further, *wabi-sabi* holds that greatness exists in the inconspicuous and overlooked details and that beauty can be coaxed out of ugliness (Koren, 1994). To this end, there is no one ideal, that we might find in a NISO standard. Rather beauty in this case is the structure that is ordinary or perhaps even slightly broken or worn, yet still functional. This is like the concept of origination mentioned previously, except with a significant shift in the available categories for consideration. Provided the function is preserved in the cup with a rough side and a partial imperfection (intentionally or unintentionally present), then invoking the category of a *wabi-sabi* cup we can see that origination is a useful heuristic to assess its aesthetic qualities.

Mono no aware is a similar aesthetic conception. However, it seems to emphasize the reaction of the perceiver as well as a non-duality conception of representation and perceiver (Yoda, 1999). The non-duality conception eschews the objectification of the art object, and turns a mirror to perceiver as to what they are in relation to what is perceived – the representation. In this case, we care more about the interrelationship between these two than in the representation alone.

Wabi-sabi is in our operationalization here, closely aligned to origination, so does not pose a great burden on the particulars of our propositions. *Mono no aware* as operationalized here is different. It evokes other response theories that we ruled out-of-scope previously, but are worthy of future exploration in relation to an aesthetic evaluation of IOFs.

This concludes part 1, where we establish the theoretical basis for this project. In part 2 we will develop an evaluative rubric, apply the rubric in two case studies, and discuss the results.

References

Andersen, J. (2008), "Knowledge organization as a cultural form: from knowledge organization to knowledge design", *Culture and Identity in Knowledge Organization: Proceedings of the 10th International Conference for Knowledge Organization in Montreal, Quebec*, Vol. 2008, pp. 269-274.

Bender, J.W. (2003), "Aesthetic realism 2", in Levinson, J. (Ed.), *The Oxford Handbook of Aesthetics*, Oxford University Press, Oxford and New York, NY, pp. 80-98.

Currie, G. (1989), *An Ontology of Art*, St Martin's Press, New York, NY.

Danto, A.C. (1981), *The Transfiguration of the Commonplace: A Philosophy of Art*, Harvard University Press, Cambridge, MA.

Davies, D. (1999), "Artistic intentions and the ontology of art", *British Journal of Aesthetics*, Vol. 39 No. 2, pp. 148-162.

Feinberg, M. (2011), "How information systems communicate as documents: the concept of authorial voice", *Journal of Documentation*, Vol. 67 No. 6, pp. 1015-1037.

Gombrich, E. (1960), *Art and Illusion: A Study in the Psychology of Pictorial Representation*, Pantheon Books, New York, NY.

Goodman, N. (1968), *Languages of Art: An Approach to a Theory of Symbols*, Bobbs-Merrill, Indianapolis, IN.

Gorman, M. (2007), *RDA: The Coming Cataloguing Debacle, Special Libraries Cataloguing*, available at: www.slc.bc.ca/rda1007.pdf (accessed 21 February 2012).

Hjørland, B. (1992), "The concept of 'subject' in information science", *Journal of Documentation*, Vol. 48 No. 2, pp. 172-200.

Howell, R. (2002a), "Types, indicated and initiated", *British Journal of Aesthetics*, Vol. 42 No. 2, pp. 105-127.

Howell, R. (2002b), "Ontology and the nature of the literary work", *The Journal of Aesthetics and Art Criticism*, Vol. 60 No. 1, pp. 67-79.

Koren, L. (1994), *Wabi-sabi for Artists, Designers, Poets & Philosophers*, Stone Bridge Press, Berkeley, CA.

Levinson, J. (1980), "What a musical work is", *The Journal of Philosophy*, Vol. 77 No. 1, pp. 5-28.

Levinson, J. (1996), *The Pleasures of Aethetics: Philosophical Essays*, Cornell University Press, Ithaca, NY.

Levinson, J. (2002), "The irreducible historicality of the concept of art", *British Journal of Aesthetics*, Vol. 42 No. 4, pp. 367-379.

Levinson, J. (2003), "Philosophical aesthetics: an overview", in Levinson, J. (Ed.), *The Oxford Handbook of Aesthetics*, Oxford University Press, Oxford and New York, NY, pp. 3-24.

Library of Congress (2008), *Subject Headings Manual*, Library of Congress, Washington, DC, available at: www.loc.gov./cds/PDFdownloads/shm/index.html (accessed 3 February 2012).

Mai, J.-E. (2000), "Deconstructing the indexing process", *Advances in Librarianship*, Vol. 23, pp. 269-298.

Mai, J.-E. (2001), "Semiotics and indexing: an analysis of the subject indexing process", *Journal of Documentation*, Vol. 57 No. 5, pp. 591-622.

Manovich, L. (2000), *The Language of New Media*, MIT Press, Cambridge, MA.

Nehamas, A. and Woodruff, P. (1997), "Symposium", in Cooper, J.M. (Ed.), *Plato: Complete Works*, Hackett Publishing Company, Indianapolis, IN, pp. 457-505.

Ojennus, P. and Tennis, J.T. (2013), "Modeling the aesthetic axis of Information Organization Frameworks II: case studies", *Journal of Documentation*, in press.

Ranganathan, S.R. and Gopinath, M.A. (1967), *Prolegomena to Library Classification Theory*, 3rd ed., Asia Publishing House, Bombay.

Richardson, E.C. (1964), *Classification: Theoretical and Practical: Together with an Appendix Containing an Essay Towards a Bibliographic History of Systems of Classification*, 3rd ed., Shoe String Press, Hamden, CT.

Rorty, R. (1982), *Consequences of Pragmatism*, University of Minnesota Press, Minneapolis, MN.

Scarry, E. (1999), *On Beauty and Being Just*, Princeton University Press, Princeton, NJ.

Schafer, K. (2011), "Faultless disagreement and aesthetic realism", *Philosophy and Phenomenological Research*, Vol. 82 No. 2, pp. 265-289.

Sundin, O. and Johannisson, J. (2005), "Pragmatism, neo-pragmatism and sociocultural theory: Communicative participation as a perspective in LIS", *Journal of Documentation*, Vol. 61 No. 1, pp. 23-44.

Svenonius, E. (2004), "The epistemological foundations of knowledge representations", *Library Trends*, Vol. 52 No. 3, p. 571.

Tennis, J.T. (2007), "The economic and aesthetic axis of information organization frameworks", *Proceedings of the North American Symposium on Knowledge Organization in Toronto, Ontario, 2007*, pp. 112-113.

Tennis, J.T. (2008), "Epistemology, theory, and methodology in knowledge organization: toward a classification, metatheory, and research framework", *Knowledge Organization*, Vol. 35 No. 2/3, pp. 102-112.

Tennis, J.T. (2010), "Measured time: imposing a temporal metric to classification structures", *Proceedings of the 11th International Conference for Knowledge Organization in Rome, Italy*, Vol. 2010, pp. 223-228.

Tennis, J.T. and Jacob, E.K. (2008), "Toward a theory of structure in information organizatin frameworks", *Culture and Identity in Knowledge Organization: Proceedings of the 10th International Conference for Knowledge Organization in Montreal, Quebec*, Vol. 2008, pp. 262-268.

Walton, K.L. (1970), "Categories of art", *The Philosophical Review*, Vol. 79 No. 3, pp. 334-367.

Walton, K.L. (1990), *Mimesis as Make-believe: On the Foundations of the Representational Arts*, Harvard University Press, Cambridge, MA.

Yoda, T. (1999), "Fractured dialogues: *mono no aware* and poetic communication in the Tale of Genji", *Harvard Journal of Asiatic Studies*, Vol. 59 No. 2, pp. 523-557.

Zangwill, N. (2003), "Aesthetic realism 1", in Levinson, J. (Ed.), *The Oxford Handbook of Aesthetics*, Oxford University Press, Oxford and New York, NY, pp. 63-79.

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