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Joseph T. Tennis
The University of British Columbia, Vancouver, Canada

Function, Purpose, Predication, and Context of Information Organization Frameworks

Abstract: This paper outlines the purposes, predications, functions, and contexts of information organization frameworks; including: bibliographic control, information retrieval, resource discovery, resource description, open access scholarly indexing, personal information management protocols, and social tagging in order to compare and contrast those purposes, predications, functions, and contexts. Information organization frameworks, for the purpose of this paper, consist of information organization systems (classification schemes, taxonomies, ontologies, bibliographic descriptions, etc.), methods of conceiving of and creating the systems, and the work processes involved in maintaining these systems. The paper first outlines the theoretical literature of these information organization frameworks. In conclusion, this paper establishes the first part of an evaluation rubric for a function, predication, purpose, and context analysis.

1 Introduction

A diversity of technologies and practices has resulted in a diversity of information organization frameworks. That is, in order to fulfill particular needs, information workers have constructed information organization frameworks for those needs and in many cases have used different technologies and components to fulfill different purposes, built on different predications, to perform different functions, while in a particular context. For example, the theories of bibliographic control state that the library catalogue allows users to find, collocate, identify, select, and obtain materials in a library (Svenonius, 2001).[1] That is, the functions of bibliographic control in a library catalogue are fivefold – find, collocate, identify select, and obtain materials, the functions are built into the catalogue system, and the context is a library.

For the purpose of this paper, an information organization framework consists of information organization systems (classification schemes, taxonomies, ontologies, bibliographic descriptions, etc.), methods of conceiving of and creating the systems, and the work processes involved in maintaining these systems.

Information organization frameworks comprise bibliographic control, information retrieval, resource discovery, resource description, open access scholarly indexing, personal information management protocols, and social tagging. Each of these has grown out of a need to manage the interaction between information and users. However, each of these information organization frameworks addresses these need in different ways. They differ in purpose, predication, function, and context.

Bibliographic control, as outlined by Patrick Wilson (1968), takes as its purpose the delivery of the *best textual means to an end*, which requires the development of tools

(what Wilson calls bibliographical instruments) that offer control over a body of writings. Bibliographic control, made manifest in catalogues, exists in the context of libraries and bibliographic utilities, like the WorldCat database. In contrast, social tagging has grown out of a need to share items among a social group. As flickr.com, a system that uses social tagging, says of itself, "We want to help people make their photos available to the people who matter to them," and "We want to enable new ways of organizing photos," (flickr, 2005).

The differences between social tagging and bibliographic control are at least four-fold. First, the explicit purpose (as seen through the writings on these frameworks) is different. Bibliographic control has as its purpose of facilitating the *best textual means to an end* (Wilson, 1968). Social tagging is a framework whose purpose is to facilitate sharing pictures as well as creating a space for novelty in sharing and describing pictures. Second, the predications of authoritative descriptive control are present in bibliographic control, but absent in social tagging. Third, the functions of the components of the system are not the same – nor are they built to do the same things. For example, the terms in flickr are not controlled vocabulary terms, like many of those in bibliographic control, and there is no explicit functionality desired that is comparable to the catalogue's *find, collocate, identify, select,* and *obtain* (Svenonius, 2001).[2] Sharing is a function that could be dissected in this way, and would point out differences between these two frameworks. Finally, the context in which these information organization frameworks operate is not the same. The context of sharing photos online, of replicating a sharable photo album in a web environment, is not the same as the context in which the catalogue is built and maintained.

The perceived similarity between these information organization frameworks is that they are all built for retrieval. However, retrieval happens in many different contexts, and for many different reasons via a diverse set of systems and components of systems. For example, Svenonius claims that the inventory purpose of the catalogue is primary, and so disagrees with Wilson's (1989) focus on the collocation function of the catalogue (Svenonius, 2001, 204 n24). This is a complicated argument, and an example of disagreement on purpose, predication, function, and context that requires further analysis in order to evaluate the best way to proceed with development and implementation of information organization frameworks in information systems. How much should the inventory function be present in evaluations of contemporary catalogues that do not point to only those items they own? An explication of purpose in line with predication, function, and context would help us answer this question.

The importance of identifying a diversity of purposes, predications, functions, and contexts of information organization frameworks is to create better evaluation rubrics for the design specifications, work processes and resultant representations in information systems across the global learning society. We can refine the evaluation rubrics (checklists, comparative models, fieldwork analysis codebooks, etc.) if we have more refined understanding of the diversity in information organization frameworks, their purpose, predication, function, and context.

The next sections outline the purpose and predication, function, and contexts as seen through information organization frameworks, and discuss components of an evaluation rubric built on this comparison.

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2 Information Organization Frameworks

Information organization frameworks consist of purposes, predications, functions, and context. In this section we introduce these concepts.

2.1 Purpose and Predication

Purpose is defined in this paper as *the reason for why something is created.* The purposes of information organization frameworks are retrieval, attestation, and inference. We will first discuss retrieval. Retrieval can be achieved in various ways, and furthermore, it can be assumed that retrieval is not defined the same way for each information organization framework. That is, we cannot assume that the purpose of retrieval is operationalized in the same way, and that by extension each information organization framework functions in the same way and in the same context. To understand these differences we must first outline the explicit predications (operationalizations) of information organization frameworks, and then their functions and contexts.

Retrieval, as a purpose for information organization frameworks, is built on a combination of predications. Predications are the assertions of purpose on which functions are built. They are operationalizations of purpose. They are a bridge between purpose and function. Retrieval, if we understand it to be the ability to *find something*[3] relies on a spectrum of predications – specifically, control measures, matching measures, and display measures.

One wants control over a set of documents in order to retrieve a set of them. Wilson argues there are two types of control *descriptive control* and *exploitative* control. Following Wilson we can say that descriptive control is the power line up writings in some arbitrary order (Wilson, 1968, 25), and exploitative control is ability to procure the best text for the intended use of said text (Wilson, 1968, 25). Control guides the implementation of catalogues. It also guides decisions to employ standards for the various functions of the catalogue (find, collocate, etc.).

The second predication on which retrieval is built is on a spectrum of *matching* measures. In current systems matching can be seen as necessary for control while control is not necessary for matching. For example, we do not need to achieve control over documents in order to match, especially in full-text corpora. In many cases, matching is required to illustrate that one has control over a set of documents. In most online catalogues we are dealing with a mix of both purposes. However, that is not the case for most web search engines. Thus, control is predicated on matching, but matching is not predicated on control.

The third predication on which retrieval is built is display. This predication also borrows from another purpose (attestation), but it is important to retrieval because it aids control and matching. We must have conceptual and actual mechanisms in place that display the results of matching and control. Work on display has been a concern of many who work with information systems, and is an ongoing field of research in information organization frameworks (Carlyle, 2002; Yee, Swearingen, Li, and Hearst, 2003). Display is often assumed, and not accounted for as a separate operationalization of the purpose of a system. Carlyle's work opens up this discussion in bibliographic control,

and in so doing asks us to reflect in a purposive way on what we are doing with displays in information organization frameworks.

Another purpose of information organization frameworks is *attestation*. Information organization frameworks make attestations about resources (descriptions of them e.g., subject matter, title, relevance ranking etc.), which are reinforcements of matching and control and enable subordinate functions. The predications of these attestations can be explicit and static in the form of *representation* of title or subject matter, or they can be dynamic and derived from relationships between documents as decided by query expansion algorithms or ranking algorithms. Attestations require a link to authority – either based *terminology* employed (that of a authorized scheme or not) or in *identity* of tagger (indexer) as seen in flickr or Amazon.com's use of tagging (Amazon, 2006).

Inference is the third type of purpose employed by information organization frameworks. Inference can be simple or complex. For example inference allows users of catalogues to *identify* particular documents – a function of catalogues (Svenonius, 2001). Inference is also what the structure of ontologies allows machines and users to do. Inference, like control, requires some representation and attestation of authority in identity and terminology.

These purposes and predications can be seen at work in information organization frameworks, and they vary by matters of degree between these frameworks. For example, we might see little to no inference done by machine in bibliographic control, but we can see how structures employed in bibliographic control could be modified for inference – this would then add a layer of purpose to those structures that we want to account for in evaluation. Making purposes explicit lays the groundwork for evaluation because we can see the relationships between purpose and function.

2.2 Function

Functions in this paper are *the actions intended by an information organization framework.* The functions facilitated by the library catalogue, as outlined by Svenonius, are to allow users *find, collocate, identify, select,* and *obtain.*[4] Functions of social tagging, as seen in the flickr example, might be called *sharing* and *annotation*, where the system facilitates these functions above all other accidental functions related to collocation, for example.

The question then surfaces, can *sharing* be seen as *finding, collocation,* or *identifying?* Here we have the intersection of purposes of retrieval and attestation, and its consequent functions. It is also a case where identity in attestation affects the function of flickr as an information organization framework. Because much of what is done in bibliographic control is delegated (Fairthorne, 1961, 124-134), and sharing photos is not, we can see bibliographic control as an anonymous aid in finding, collocation, and identification based on some third authority (published controlled vocabularies and standards). Whereas the sharing function of flickr is built on social groups and identity – my social group decides what terms to use, and builds these uncontrolled vocabularies for itself. So in the case of flickr, sharing can be seen as a social function linked to a type of identity (my tags versus your tags) distinct from identity, as it is understood in

bibliographic control (identity of a an authoritative list of subjects and standards and training in applying these subject headings).

It is of course to see accidental functions of information organization frameworks. So we might search flickr thinking it should function like a catalogue, and in some cases we may be pleasantly surprised, but we cannot evaluate flickr based on this accidental function, and read into it a different purpose than for which it was built.

2.3 Context

Functions, predications, and purposes are conceived and realized in a context. Context in this instance comprises the information system, the user, and the larger social system in which the information system and the user operate. Context for bibliographic control then, is the catalogue, catalogue users (including professionals), and the environment in which the users and the catalogue operate. The context for flickr is different. Here we are not dealing with a catalogue. We are dealing with personal collections of photos that can be shared with a small group or with anyone. There is not attempt at controlling these photos. And in many cases, the tags used to identify these photos are shared via email or face-to-face interaction. Context here then is not in anonymous mediation to controlled representations. The context here is a social group deciding how to share photos in a novel tool. Contexts offer secondary functions and purposes as well.

The definition of, and the unit of analysis for, context are not clearly defined in LIS. There are a number of discussions of context at various levels and with different foci (Cool, 2001; Davenport and Hall, 2002; Hjørland and Albrechtsen, 1995; Hjørland and Kyllesbech Nielsen, 2001; Rasmussen, Mark Peijtersen, and Goodstein, 1994; Solomon, 2002; Tennis, 2003; Wilson, 1968). We cannot develop this idea here. This is an area that requires further work.

3 Evaluation Rubric for Information Organization Frameworks

This section presents a brief rubric. The evaluation rubric presented here is not comprehensive. It is a start, but more frameworks can be analyzed in order to improve this rubric. The purposes of the rubric are to attest to (1) the purposes of the information organization framework, (2) the predications of the information organization framework, (3) the functions that enable that purpose, and (4) how well it achieves its purpose. This rubric makes explicit these four categories in order to (a) speciate the information organization framework – making explicit the tenets on which the framework was built and distinguishing intended use from accidental use, and (b) laying bare the relationship between intension and action in information organization frameworks.

The fourth point above, the degree to which an information organization framework achieves its purpose, is a complicated matter to interpret. It is important to consider the evaluation in a number of ways, fulfilling purpose is just one of those ways. And even with this partial look at evaluation we are left with only the rubric. We do not have the values that might be associated with the categories in the rubric. That is substance for future research.

The rubric that follows uses the elements of information organization frameworks as the grid through which we can identify purposes, predications, functions, and the

degrees of success. It is important to note that evaluation here does not account for interface interactions or other kinds of usability concerns. The evaluation rubric presented here only addresses the structures for information organization. The first table presents purposes and predications.

PURPOSES and PREDICATIONS		
Purposes	**Predications**	
Retrieval		
	Control	
		Descriptive (arbitrary criteria)
		Exploitative (best texts)
	Matching	
		Without Query Expansion
		With Query Expansion
	Display	
		Descriptive (arbitrary criteria)
		Exploitative (best criteria)
Attestation		
	Terminology	
		Opaque Language
		Transparent Language
	Representation	
		Static (e.g., alphabetical)
		Dynamic (ranking)
		Explicit (from record or document)
		Implicit through Relationships between other Documents
	Identity	
		Anonymous (no identity)
		Link to some Authority (e.g., LCSH)
		Link to Assertions (link to other indexing work, e.g., other tags in flickr)
		Profile Available (as in Amazon.com)
Inference		
	Relatedness	
		Explicit (in vocabularies, etc.)
		Implicit (interpreted by user)
	Joint Assertions	
		Through combining structures (merging)
		Through *if then* statements (logical inference)

Table 1. Purposes and Predications

This table schematizes the discussion in section 2 above. The intended use of this rubric is to lay bare the intended (and accidental) purposes and predications of information organization frameworks. This makes explicit the components and intension of design. The functions make explicit the actions of an information organization framework. They are perhaps too numerous to list in their entirety here, but a short list can be provided in Table 2.

FUNCTIONS (an incomplete list)	
	Find (locate)
	Collocate
	Identify
	Select
	Obtain
	Share
	Recall
	Pinpoint [precision]
	Store
	Input
	Inventory

Table 2. An Incomplete List of Functions

4 Future Work

Future work in information organization frameworks will apply the rubric presented here to different frameworks. It will also identify the boundaries of the construct *information organization framework.* It will also outline a vocabulary for discussing how well a framework achieves its purpose.

5 Conclusion

This paper is a first step in a identifying an analytical tool for evaluating information organization frameworks. It is also a first step in comparing these frameworks in an attribute-by-attribute manner. Researchers have illustrated concern of reinvention of information organization frameworks by fields unfamiliar with the literature of LIS (Soergel, 1999; Vickery, 1997; Veltman, 2004). However, these accounts have not dissected the purposes, predications, functions, and contexts of these frameworks. As the work unfolds, it is hoped that this rubric will aid researchers is making claims about indention and design in information organization frameworks, and that this will provide a richer vocabulary for evaluation and comparison of these important tools for the global learning society.

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[1] Svenonius (2001) has a sixth function – navigate – but is seems different in kind, and deserves longer discussion than this paper allows.
[2] See note 1 above.
[3] Or Wilson's *best textual means to an end* (Wilson, 1968).
[4] Svenonius (2001) also discusses and *inventory* function, not listed as an explicit part of the full-featured bibliographic system. However, in a wider context of information organization frameworks this is important to consider. It is also a clue to the more implicit or hidden purposes, predications, and functions that have yet to be discussed.