

Toward a Theory of Structure in Information Organization Frameworks

Joseph T. Tennis and Elin K. Jacob

In this paper, we adopt a formal and systematic approach to explicate the role of structure in information organization and outline a limited set of constructs that we contend are useful for understanding the similarities and differences that obtain across information organization systems. This work builds on and extends previous work in classification theory, and provides the necessary groundwork for development of a *theory of structure* which will serve as a lens through which to observe patterns across systems of information organization.

We begin by defining the construct of an Information Organization Framework as a tool that has been designed and created both to represent and to organize information resources. An information organization framework has three major constituents: structure, work practice(s), and discourse(s). Discourse establishes the “limits of acceptable speech” (Butler, 1997) of representation and organization by constraining the objectives and operations of the framework. These constraints have a direct affect on the application and evaluation of the Information Organization Framework since it is through such discourse that values, priorities, and identities are articulated by and subsequently influence both the work practice(s) and the structure of the framework itself. Work practice(s) are those actions which, taken at the micro and macro levels, serve to implement the structure of the framework and shape its subsequent evolution. Loosely defined, then, structures are the mechanisms for representing and organizing the information made manifest by work practice(s) within a discourse.

We define the construct of structure as a metaphor for a constructed and bounded space containing a set of internal partitions, each of which is connected to other partitions in the set in a meaningful way, either as a linear sequence (i.e., a continuum or process), a network of links (i.e., a web), or a hierarchical (or polyhierarchical) organization of part-whole and/or is-a relationships. In the context of an information organization framework, a structure is a cohesive whole or “container” that establishes qualified, meaningful relationships among those activities, events, objects, concepts which, taken together, comprise the “bounded space” of the universe of interest. The level to which this container establishes meaningful relationships is governed both by its type and aggregation level.

In order to define a theory of structure, this partitioned and bounded space, it is necessary to examine what is intended by the term *structure* in Knowledge Organization and in extant discourses. From this starting point, we then present a set of essential postulates for a theory of structure that provide support for two axes of structural differentiation: *prototypical structures* (the primary structural units described in the literature of knowledge organization and implemented in organization systems) and *levels of aggregation* (ranging from simple combinations of the primary units to large complexes of structure). We then introduce specific examples from the literature to substantiate our claim that a coherent theory of structure is a fruitful approach to the study of these tools and to support our claim that such a theory of structure would, through its lens, provide insight for identification and evaluation of current and future patterns of structural

diversity appearing in the interdisciplinary world of knowledge organization systems design.

This work grows out of a pressing need to compare the structures of folksonomies, thesauri, term lists, and ontologies. While these indexing languages all point to resources, they work in very different ways. While the knowledge organization community shares a basic understanding of these structures based upon extant textbooks and dispersed theoretical discussion, there is increasing need for a theory of structure that will provide a lens through which we can compare emerging structures (i.e., folksonomies); systematically assess their similarities and differences; rigorously identify their strengths and weaknesses; and detect gaps in our understanding of these tools for organization and retrieval.

Butler, J. (1997). *Excitable Speech: A Politics of the Performative*. (New York: Routledge).