Chapter 11

Academic Libraries as Complex Systems

Álvaro Quijano-Solís
El Colegio de México, Mexico

Guadalupe Vega-Díaz
El Colegio de México, Mexico

ABSTRACT
The purpose of this chapter is to describe how the concepts and principles from the Systems Approach may be helpful in understanding and modeling the collaborative group cognitive processes in information handling in an academic library. In order to address complexity and dynamics, this chapter analyzes several theoretical positions, which together may help us to shape the academic library from a comprehensive and systemic point of view (such as Systems Approach, Communities of Practice, Activity Theory and the Viable System Model). This chapter suggests focalizing on the activity (performed by a community) as the basic unit of analysis in studying the complexity of academic libraries. This activity is what allows the transmission of tacit and explicit knowledge and the skills from an expert to a novice. Other elements in the activity are objectives, rules and regulations, and importantly the learning processes that occur dialectically between subjects and community. A model such as Beer’s in the way the authors presented it in this chapter fits well to decompose reality and synthesize it to analyze the proposed complexity. This may allow facing organizational problems by focusing in the way people act to transform the inputs into products and add value to them by teaching and learning.

I. INTRODUCTION
Academic libraries are information systems that may be perceived as an uncomplicated organism, a simple organization, whose productive processes are linear events that end after a product is elaborated or a service is delivered, with no further complications during that time. This perception is promoted by the fact that libraries are embedded in a larger organization (college, university or research center), so we might assume that environment is a placid one (cfr. Emery and
Trist, 1965), meaning that adaptation processes in academic libraries are quick and smooth.

However a detailed analysis of academic library allows us to see that they are dynamic and complex organizations which are in constant evolution. So, the environment of an academic library is close to what Emery and Trist (1965) call turbulent field, with dynamic properties that move constantly the library’s “ground”. For example, some operations that are perceived as simple, such as locating information, requesting books on loan, going to the reference desk, etc., involve a wide range of activities developed by working groups that share a common purpose, working tools and follow a set of rules and principles.

As it may be seen there is a need to rethink academic libraries as complex systems with a huge amount of components and relations between them, all this in a turbulent environment. The purpose of this paper is to describe how the concepts and principles from Systems Approach may be helpful in understanding and modeling the collaborative group cognitive processes in information handling in an academic library.

In attempting such an explanation of an academic library, we stick to Morin’s thoughts in the sense that “…we must question the adequacy of all explanations based on simplification of principles. Complexity is not a surface noise of the real, but is the very principle of the real…Uncertainty, indeterminism, randomness and contradictions occur, not as residues to be eliminated by explanation, but as non-eliminatable ingredients of our perception/cognition of the real.” (Morin, 1992, cited by Leleur, 2008, p. 73).

In order to address complexity and dynamics, this chapter analyzes several theoretical positions, which together may help us to shape the academic library from a comprehensive and systemic point of view. This chapter is divided into eight sections, this Introduction being section one.

The first theoretical approach is the System Approach itself, from which we introduced the recognition of environment and context as elements of the metasystem that drive the analysis of the role and functions of the academic library (section II). In section III we present the general characteristics of a system and the importance of academic libraries being observed as organization whose components are interrelated among them by human processes such as collaboration (developed in section IV).

The next theoretical position, refers to communities of practice (CoP) (section V). These communities are not hierarchically structured nor established, thus allowing individuals to organize them independently, in a spontaneous way in order to meet the demands coming from the information systems environments (cfr. Wilson, 2008; Davenport and Hall, 2002).

CoP promote situated learning and the application of knowledge in solving problems and hence allow to establish collaborative partnerships among subjects who develop an activity in an academic library. From the CoP we may observe that the ways of using the tools and applying the rules in the work place, go from one generation to the other through processes of experience in daily practice in solving problems. For instance, in the case of the rules and principles used in cataloguing it could be argued that these have historically been agreed from the knowledge and experiences that have aroused when developing cataloguing items.

To identify the components that enable the transmission of experience and knowledge in a community of practice, in Section VI we outline Theory of Activity (TA) that we suggest focalizing on the activity (performed by a community) as the basic unit of analysis in studying the complexity of academic libraries. This activity is what allows the transmission of tacit and explicit knowledge and the skills from an expert to a novice. Other elements in the activity are objectives, rules and regulations, and importantly the learning processes that occur dialectically between subjects and community.
Related Content

Attribute Reduction Using Bayesian Decision Theoretic Rough Set Models
[www.igi-global.com/article/attribute-reduction-using-bayesian-decision-theoretic-rough-set-models/111310?camid=4v1a](www.igi-global.com/article/attribute-reduction-using-bayesian-decision-theoretic-rough-set-models/111310?camid=4v1a)

Measuring Democracy on Web Interface Design
[www.igi-global.com/chapter/measuring-democracy-on-web-interface-design/112694?camid=4v1a](www.igi-global.com/chapter/measuring-democracy-on-web-interface-design/112694?camid=4v1a)

The Role of the Researcher in New Information Infrastructure Research
(2012). *Perspectives and Implications for the Development of Information Infrastructures* (pp. 196-217).
[www.igi-global.com/chapter/role-researcher-new-information-infrastructure/66263?camid=4v1a](www.igi-global.com/chapter/role-researcher-new-information-infrastructure/66263?camid=4v1a)

Improved Secure Data Transfer Using Video Steganographic Technique
[www.igi-global.com/article/improved-secure-data-transfer-using-video-steganographic-technique/182291?camid=4v1a](www.igi-global.com/article/improved-secure-data-transfer-using-video-steganographic-technique/182291?camid=4v1a)