Dynamic Networks. An interdisciplinary study of network organization in biological and human social systems.

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Abstract

This thesis is about a metaphor; it explores the idea that human organizations could be treated “as if” they behaved like biological systems. The thesis focuses on one biological metaphor in particular – the idea of a living *network*.

The thesis begins with an exploration of the philosophical background to my research. The development of rationalistic and reductionist approaches to systems enquiry is described, and the limitations of these approaches are discussed. This is followed by a discussion of non-linear, holistic and other approaches, including a newly emerging perspective known as Inclusionality. Communication is an important aspect of both human and biological systems, so I continue by examining established theories of communication, showing how they have influenced the way we understand communicative systems. A chapter is devoted to the subject of metaphor, which explains how in contemporary research, metaphor is treated not merely as a linguistic device, but as a *cognitive* tool that reflects how we make connections between ideas. Various metaphors for human organizations are discussed, including the network metaphor.

I deal with network theory itself in some detail, firstly exploring conventional network theory, which is concerned with networks that are *node* based, and secondly with the organization of natural biological networks which are quite different in form and are the products of autocatalytic *flow*. The concept of the “flow-form network” as a metaphor for human organizations is explored, and some of the methodological issues concerning the study of such networks are discussed.

The latter part of the thesis describes a practical study of a human organization, where communicative patterns were investigated. The study highlights how flow-form networks might be identified in human organizations, as well as the limitations that conventional methods of enquiry pose in such an investigation.

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