Chapter 11
Knowledge Cybernetics:
A Metaphor for Post-Normal Science

Maurice I. Yolles
Liverpool John Moores University, UK

ABSTRACT

Knowledge cybernetics is part of complex systems, and a post-normal science approach principally concerned with the development of agents like autonomous social collectives that survive through knowledge and knowledge processes. Deriving from epistemological antecedents created by Stafford Beer and explored through notions of ontology by Eric Schwarz, a new form of knowledge management arises that is connected with the notions of Marshall and her new radical classifications for knowledge. These ideas can be closely associated with concepts of lifeworld and the ideas of communicative action by Habermas, and leads to a useful knowledge cybernetic framework. This has the capacity to relate to and develop a variety of what might be thought of as otherwise disparate theories that can ultimately be expressed in terms of knowledge.

INTRODUCTION

Systems theory has been developed to allow us to model what we see about us so that we can increase our understanding of the problem-solving and decision-making processes that allow us to create improvement. It is not important whether the systems are regarded as a metaphor or as real, since they provide us with templates of ideal relationships and modes of being that can be applied to the complex human activity situations that we see around us. Where complex situations are represented as systems that, over time, represent characteristics of durability, notions of viable systems using cybernetic principles have developed. These enable us to explain how and why such durability continues, and gives us a better understanding about the nature of the complexity. There are very few theoretical formulations for autonomous viable systems, the most well known being that of managerial cybernetics as developed by Stafford Beer (1959, 1985). However, a different approach was developed by Eric

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Schwarz (1994, 1997), who recognises that viable systems can pass through processes of emergence and evolution towards complexity and autonomy. This occurs through the development of patterns: patterns of self-organisation that accommodate phenomenal change through morphogenesis and new forms of complexity; patterns for long term evolution towards autonomy; and patterns that lead to systems functioning viably through their capacity to create variety. One of the problems with Schwarz's theory is that it is does not engage with theory that relate to human activity systems, for instance from social or psychological sciences. While it provides templates for creating structures and mechanisms of viability, it has no human related content. Knowledge Cybernetics is a development of Schwarz's approach to modelling viable systems, drawing on a variety of other works to fill this epistemological gap.

Like the promise of Schwarz's modelling approach, Knowledge Cybernetics has developed as part of post-normal[1] science. Since its formal inception in 2006, it has had a number of empirical developments. These include, for instance: Guo's (2006) study of Organisational Patterning that empirically explores the pathology and coherence of a number of State banking corporations in China in relation to their capacity to successfully undertake transformational change; Jirapornkul's (2009) empirical examination of Thai corporate cultural coherence that derives from a study by Yolles (2007) exploring cultural mapping; Fink's (2008) exploration of culture shock and culture stretch in multicultural environments, in particular within and processes of hybridisation; Choudhury et al. (2007) have developed a new mathematical area of knowledge processes from ideas asserted within KC; and Achakul is currently in the process of empirically exploring the relationship between knowledge profiling (Yolles, 2006) and motivation.

The purpose of this chapter is to illustrate some of the modelling utilities of Knowledge Cybernetics. Cybernetics is concerned with the control and communication features of coherently controlled (systemic) structures and their regulation that are essential to all social (and other) contexts. It is in particular concerned with "circular causality", for instance by the action of a system in an environment that causes change. That change is manifested in the system through feedback (often in the form of information), can in turn affect the way it behaves. The feedback systems adopted in Knowledge Cybernetics arise originally from Schwarz, expressed here in terms of Social Viable Systems theory, and are constituted within a metamodel of cybernetics processes of autogenesis and autopoiesis[2].

Knowledge Cybernetics can be classified as part of the Maruyama's *relevantial universe*[3], in contrast to his relatively simple *relational* or very simple *classificational* universes. Each of the three universes have different degrees of complex potential to provide information. If Knowledge Cybernetics were classificational, then, attempting to *migrate* a relevantial theory into its frame of reference would be of little use since it would involve the reduction of information, and all information filtering processes are notoriously problematic. In contrast, migrating theory from a classificational universe to relevantial universe enriches the former, but how it is enriched is a serious matter to question. This process of migration can only occur through the use of a set of principles that guide how it can be done. While it should be possible to use any appropriate relevantial theory for this, this paper uses Knowledge Cybernetics, and it is shown that the migration process is capable of adding theoretical bones to any appropriate theory of interest. For instance in Yolles (2006) the theory was used to explore Myers-Briggs Type Inventory (MBTI), showing how a classificational type theory could be developed within a relevantial universe, and in so doing providing for greater potential to the theory to explain more complex personality processes.

Knowledge Cybernetics is metaphorical in that it: explores knowledge formation and its