IDEA GROUP PUBLISHING
701 E. Chocolate Avenue, Hershey PA 17033-1117, USA
Tel: 717/533-8845; Fax 717/533-8661; URL-http://www.idea-group.com
ITB7409

Chapter VII

A Case Study of the Use of the Viable System Model in the Organization of Software Development

Peter Kawalek
Manchester Business School, UK

David Wastell
University of Salford, UK

This chapter considers the usefulness of the Viable System Model (VSM) in the study of organizational adaptation. The VSM is a rigorous organizational model that was developed from the study of cybernetics and has been given considerable attention by management science research. The chapter presents a longitudinal case study that focuses upon a software development team. The VSM was useful in diagnosing the likely consequences of different organizational designs and in prescribing an alternative solution.

INTRODUCTION

This chapter focuses upon the issue of business adaptation, specifically describing a case of a software development enterprise. The theoretical basis for the analysis is drawn from systems theory, in particular the Viable System Model (Beer, 1979, 1985).

Systems theory has a broad relevance, as many different scientific disciplines grapple with their own issues of organization and adaptation (see Capra, 1996, for a useful synthesis). Information systems (IS) research has been particularly receptive to such "systems thinking" (e.g., Checkland, 1981; Checkland & Holwell, 1997), possibly as a result of its need to address people and technologies as an organized complexity. Recently, as managerial disciplines have sought to address the complex and turbulent conditions of global markets, systems thinking has once again begun to permeate popular business literature. Haeckel's (1999) influential text is a good example. Amongst other things, he proposes that business should

This chapter appears in the book, Advanced Topics in Database Research by Keng Siau.

seek "sense and respond" capability with strategy being "a design for an adaptive structure." In this way, effective business management is secured through the effective modularization of the organization and the nurturing of a culture of commitment amongst the various units. Many well-established ideas, such as the need for powerful, top-down strategic plans, are redundant in Haeckel's thesis.

Haeckel has presented a timely distillation and development of ideas that have their lineage in the broader halls of systems theory. This chapter draws from a similar heritage, but its focus is upon a particular branch of systems thinking, namely cybernetics. Cybernetics has been highly influential in the development of systems concepts across many different disciplines (Checkland, 1981) and continues to attract attention today (see again, Capra, 1996). Its focus is upon patterns of control and communication in systems of all kinds and is thus described as the science of organization (Beer, 1979, 1985). We are motivated by a general interest in developing cybernetic approaches to IS problems and projects. Earlier papers have described its use in software development and the development of groupware for a manufacturing company (see the related paper, Kawalek & Wastell, 1999). We propose that cybernetic models and theory may assist the study of patterns of communication in organization and make it possible to appraise the linkage between these communication patterns and the structure of the organization itself. Our particular focus is upon theViable System Model (VSM). The VSM has been developed from cybernetic theory by Beer (1972, 1979, 1985) for application to human organizations in general. It has been given considerable attention by management scientists (e.g. Espejo & Harnden, 1989).

In this chapter, we are concerned with general organizational issues in relation to the software development process. The chapter will proceed as follows. First we will introduce the key elements of the VSM. An extended case study will then be presented in which the VSM is applied in a diagnostic fashion to understand the mutating patterns of organization structure in a large software production organization, Violet Computing. We will show how the organizational structure of VC, which was originally well-adapted to the circumstances of its business ecology, became increasingly dysfunctional as the environment became more turbulent and complex. The use of VSM, this time in prescriptive mode, will then be illustrated as a tool for designing a more appropriate organizational structure. We are therefore in alignment with the general issues motivating Haeckel's work–that many businesses of many different kinds need to be designed to be adaptive. This concern with flexibility was itself a key motivation underpinning Beer's development of the VSM.

THE VIABLE SYSTEM MODEL

Cybernetics is concerned with the identification and description of patterns of organization in complex entities. It has influenced the development of many different areas of research (e.g., the science of cognition, artificial intelligence, the study of ecosystems) and through ideas of self-organization continues to inform many debates today (Capra, 1996; pp. 51-71). The Viable System Model (VSM) is a complete organizational model that was developed from cybernetic theory by Beer. The rationale and features of the Viable System Model (VSM) are set out by Beer in a trilogy of books (1972, 1979, 1985). It is not intended that this chapter should serve as a tutorial of VSM; more modestly, our objective is only to highlight some of the main features of the VSM that are pertinent to the case study presentation later on. A fuller understanding of the VSM can be gained from a number of sources. The reader is referred to Beer's highly individual texts and, in particular, to the second of the trilogy (Beer, 1979). There are, in addition, a number of other academic writings on the