



Chapter XV

Chaos Theory as a Framework for Studying Information Systems

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ABSTRACT

This paper introduces Chaos Theory as a means of studying information systems. It argues that Chaos Theory, combined with new techniques for discovering patterns in complex quantitative and qualitative evidence, offers a potentially more substantive approach to understand the nature of information systems in a variety of contexts. The paper introduces Chaos Theory concepts by way of an illustrative research design.

INTRODUCTION

The past decade or so has witnessed considerable discussion around the study of information systems (IS). There have been a number of initiatives that have attempted to introduce theories and frameworks that might inform our understanding and research in IS (e.g., see Giddens, 1984; Nissen, Klein, & Hirschheim,

1991). Most of these initiatives have come from those who have been dissatisfied with the narrow technical conceptions of IS research. There have been repeated calls to address the social and organizational issues with respect to IS (e.g., see the collection of papers by Boland & Hirschheim, 1987). It has been argued that although the discipline has sought to address the social and organizational issues, there has been a shortage of well grounded theory and methodology on how to address these aspects (see Walsham & Han, 1990). Although in recent years there have been some attempts to fill this gap, we have as yet not been able to identify an appropriate theoretical basis for the study of information systems.

This paper introduces Chaos Theory as a means of studying IS. The paper uses the concepts to reflect on the nature and significance of IS. It is hoped that understanding the underlying assumptions and theoretical constructs through the use of Chaos Theory will not only inform better research design for studying information systems but also help practice in understanding the intricate relationships between different factors.

The paper is organized into five sections. It begins with a description of the research problem and the approach. It then sketches out the manner in which Chaos Theory views information systems. Implications for research and practice are presented in the fourth section. Finally key messages in the paper are identified and broad conclusions drawn.

THE RESEARCH PROBLEM AND APPROACH

The Problem

It has been argued that an assessment of a particular discipline must proceed with an implicit or explicit understanding of what the discipline is and how it develops (see for example Banville & Landry, 1989). In the domain of IS, there is a problem both with the manner in which we have studied IS and also with the theoretical basis that has been adopted for their study. More often than not, IS researchers have been involved in ‘academic demolition’¹. This has resulted in an inadequate analysis of the basic premise on which a theory is based.

One of the more exciting developments in studying IS in recent years has been the use of Structuration Theory (Giddens, 1984). It is the seminal work of Walsham (1993), that has brought the Structuration Theory concepts within easy reach of IS researchers. Walsham uses Structuration Theory to augment the richness afforded by contextualist analysis of managerial situations. Earlier researchers (e.g., Madon, 1991) have shown that the contextualist approach of Pettigrew (1985) falls short on a number of counts. The foremost limitation of Pettigrew’s approach is the lack

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