

# Chapter I

## Integrating the Fragmented Pieces of IS Research Paradigms and Frameworks: A Systems Approach

**Manuel Mora**

*Autonomous University of Aguascalientes,  
Mexico*

**Ovsei Gelman**

*National Autonomous University of Mexico,  
Mexico*

**Guisseppe Forgionne**

*Maryland University, Baltimore County, USA*

**Doncho Petkov**

*Eastern State Connecticut University, USA*

**Jeimy Cano**

*Los Andes University, Colombia*

### ABSTRACT

*A formal conceptualization of the original concept of system and related concepts—from the original systems approach movement—can facilitate the understanding of information systems (IS). This article develops a critique integrative of the main IS research paradigms and frameworks reported in the IS literature using a systems approach. The effort seeks to reduce or dissolve some current research conflicts on the foci and the underlying paradigms of the IS discipline.*

### INTRODUCTION

The concept of management information systems (MIS) in particular, or information systems (IS) in general, has been studied intensively since

the 1950s (Adam & Fitzgerald, 2000). These investigations have been conducted largely by behavioral-trained scientists to study the emergent phenomena caused by the deployment and utilization of computers in organizations.

This discipline, from its conception as a potential scientific field, has been driven by a dual research perspective: technical (design engineering oriented) or social (behavioral focused). This duality of man-made non-living (hardware, software, data, and procedures) and living systems (human-beings, teams, organizations, and societies), the multiple interrelationships among these elements, and the socio-cultural-economic-politic and physical-natural environment, make IS a complex field of inquiry.

The complexity of the IS field has attracted researchers from disparate disciplines—operations research, accounting, organizational behavior, management, and computer science, among others. This disciplinary disparity has generated the utilization of several isolated research paradigms and lenses (e.g., positivist, interpretative, or critical-based underlying research methodologies). The result has been the lack of a generally accepted IS research framework or broad theory (Hirschheim & Klein, 2003) and has produced: (i) a vast body of disconnected micro-theories (Barkhi & Sheetz, 2001); (ii) multiple self-identities perceived by the different stakeholders (e.g., IS researchers, IS practitioners, and IS users); and (iii) partial, disparate and incomplete IS conceptualizations (Benbasat & Zmud, 2003; Galliers, 2004; Orlikowski & Iacono, 2001).

Despite scholastic indicators<sup>1</sup> of maturity, IS, then, has been assessed as: (1) highly fragmented (Larsen & Levine, 2005), (2) with little cumulative tradition (Weber, 1987), (3) deficient of a formal and standard set of fundamental well-defined and accepted concepts (Alter, 2001, p. 3; Banville & Landry, 1989, p. 56; Wand & Weber, 1990, p. 1282) and (4) with an informal, conflicting and ambiguous communicational system (Banville & Landry, 1989; Hirschheim & Klein, 2003). Such findings provide insights for a plausible explanation of the delayed maturation of the field and the conflictive current perspectives on information systems (Farhoomand, 1987; Wand & Weber, 1990).

This article illustrates how systems theory can be used to alleviate the difficulties. First, there is a review of basic *system* and related concepts relevant to information systems (Ackoff, 1960; Bertalanffy, 1950, 1968, 1972; Boulding, 1956; Checkland, 1983; Forrester, 1958; Jackson, 2000; Klir, 1969; Midgley, 1996; Mingers, 2000, 2001; Rapoport, 1968). Next, these systems approach concepts are used to formulate a critique integrative of the main paradigms and frameworks suggested for IS research. Then, a theoretical scheme is developed to integrate holistically and coherently the fragmented pieces of IS research paradigms and frameworks. To end, this article presents future research directions on potential conflictive conclusions presented.

## **THE SYSTEMS APPROACH: PRINCIPLES AND PARADIGMS**

### **The Principles of the Systems Approach**

The systems approach is an intellectual movement originated by the biologist Ludwig von Bertalanffy<sup>2</sup> (1950, 1968, 1972), the economist Kenneth Boulding (1956), and the mathematicians Anatoly Rapoport (1968) and George Klir (1969) that proposes a complementary paradigm (e.g., a worldview and a framework of ideas, methodologies, and tools) to study complex natural, artificial, and socio-politic cultural phenomena.

Lazlo and Lazlo (1997) interpret the modern conceptualization of the systems approach as a worldview shift from chaos to an organized complexity. Boulding (1956) argues that the systems approach—labeled as general systems theory (GST)—is about an adequate trade-off between the scope and confidence in valid theories from several disciplines. In the former case the greater the level of scope the lesser the level of confidence and vice versa. For Rapoport (1968), the systems approach should be conceptualized

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