Cybernetics as a Theoretical Base for Information Systems Research

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This paper proposes the use of cybernetics as a theoretical base for conducting research on information systems. The problem of "fragmented adhocracy" in IS research is analyzed on four levels (philosophical, methodological, technique and tool). These disparate and apparently incongruent viewpoints can be encapsulated by the proposed framework. The paper discusses how principles from general systems theory, cybernetics and second-order cybernetics can be used to study and analyze specific IS problems. Specifically, the paper analyzes how the notions of purpose and purposefulness can be used to study IS-enabled value, how Ashby's law of requisite variety can be used to study interorganizational systems, how notions of emergence, hierarchy, communication and control can be used to study extended enterprises, and how autopoesis, complexity and self-organization can be used to study the interaction of information systems with other organizational systems like culture. Finally, the paper explores how cybernetics and systems theory can be used to incorporate both qualitative and quantitative variables, static and dynamic variables, and subjectivity and objectivity when operationalizing information systems research.