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Kalle J. Lyytinen

University of Jyväskylä and Academy of Finland

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Theories of Language and Information Systems: An Appraisal of Alternative Language Views for Information Systems

Kalle J. Lyytinen
Department of Computer Science
University of Jyvaskyla and
Academy of Finland
SF-40 100 Finland

ABSTRACT

Information systems (IS) draws in its research on several reference disciplines. Language and communication research, although IS's are linguistic communication systems—only technically implemented, has not been widely recognized as a reference discipline. Instead, linguistic communication in IS has been studied in terms of communication engineering, cybernetics, psychology, and organizational behavior. The main argument of the paper is that the IS research community should be more aware of different traditions for the study of language and communications. Language views proposed in linguistics and the philosophy of language have been adopted in the IS research community without a wide and open debate. However, these views exert a remarkable influence on the contents and strategies of information systems development and IS research. The paper is an attempt to describe some of the implemented language theories and their effects on IS.

Language is a confusing phenomenon. It can be comprehended in different domains. For example, the term 'data' applied in computer science applies to physically implemented symbols of language and disregards all aspects related to the meaning and use of these linguistic expressions in a social setting. In this paper we are especially interested in the latter aspect. Here we may distinguish five language views. Each of them includes dissenting assumptions and stipulations of how an IS can and should be comprehended as a linguistic entity. These views are:

1. **THE FREGEAN CORE:** a formalistic study of language in terms of relationships between the world and language. Language is a means to articulate something that is true or false. Language expressions can only denote. Aspects of use are excluded from the study by requiring that it must proceed without considering use contexts. The study is a branch of mathematics applying only our linguistic intuitions.
2. **THE CHOMSKYAN GRAMMAR:** a generative study of language in terms of structural relationships between elements of language and how they can be generated. Language is a system of connected conceptual elements. Combinations of elements are governed by syntactic and semantic rules—the grammar. These rules are possessed by an idealized, fluent speaker capable of generating and distinguishing all acceptable formations of language. The study considers meanings in 'null-contexts' and purposes of use are thus excluded.
3. **THE PIAGET SCHEMA:** a cognitive study of language in terms of relationships between the mind and linguistic behaviour. Language is understood in terms of cognitive processes and structures and its study is concerned with psychological reality and regularities. It

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proceeds without a consideration of uses and purposes of linguistic expressions. The function of language is cognitive: to provide schemata to interpret the world.

4. **THE SKINNERIAN RESPONSE:** a behavioristic study of language in terms of relationships between observable behavior and language. Language is a mechanism causing observable behavior sequences and its study concentrates on observable parameters in the use context and reveals invariances between their states. Meaning is a predisposition to respond in a certain way to a linguistic stimulus.
5. **THE ORDINARY SPEAKING:** an interactional study of language in terms of relationships between language and human action. Language is one category of human action and a manifestation of human intentionality. The study of language is concerned with social rules and it includes a description of categorical rule-knowledge. The meaning is a result of rule-governed behavior and it is always contextually determined, because contexts are defined by social practices.

A survey of the IS literature showed that all language views co-exist in the IS research community. All views, except the Piaget's schema view, have rendered a definition for an IS. All views have been or are being adopted in some phases of the systems life cycle to comprehend the linguistic communicative functions of the system. These phases are usually the early phases of systems life cycle. However, the objects, goals, and criteria of linguistic inquiry proposed in each view vary substantially. The same holds true for the way the analysis process is arranged. We show that these features are dependent on the underlying language views and can be analytically derived from the procedural image of linguistic analysis proposed in each view. Thus, the underlying language view can explain as one factor the main content, criteria, and principles of ISD tasks.

The survey also revealed that the Fregean core and the Skinnerian response views have gained a wide acceptance and a plethora of ISD methods and methodologies are based on them. The other views have had a modest impact on ISD methods and methodologies, although this should not necessarily be so. The reason for the wide application of only two views is their direct support for the formalization of the application and for the model building about the IS use in decision making, respectively. These two abstractions, however, are not adequate to understand the language used in communication and IS. A hypothesis is therefore made that a competent analyst is capable of abstracting language from many points of view and adapting this abstraction process to the problem solving context. This adaptation is mostly intuitive and takes place in an ad-hoc manner.

Idealized ISD tasks are outlined using the development of an order-processing application as a case. Finally remaining research problems are compiled. These include invitations both for theoretical and empirical studies. We need more empirical research specifically on how various views can be adapted to problem solving contexts. On the normative level we need more elaborated ISD methodologies that accommodate several views contingently. Finally, the need for refinement of the interactional view for IS is emphasized.