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HERMENEUTICS IN INFORMATION SYSTEMS

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Abstract

Information systems often face unstructured environments where it is necessary to gain understanding of nebulously expressed content. This is the case not only theoretically, but also reflects the process of how managers have to cope with most decision environments. The philosophical underpinnings of hermeneutics in this context are examined. Hermeneutics in many forms has been used to interpret obscure contexts. There have been a number of such applications in information systems, which are reviewed. A fourth approach based upon the work of Gadamer is developed. Expected results of these four methods as tools to support requirements analysis in information systems projects are provided.

Keywords: Hermeneutics, philosophy of information systems

Introduction

Information systems serve the purpose of monitoring the performance of an organization. The positivist view of IS is to provide data in an accurate and timely manner, which will result in better decisions throughout management. Many of these reports are framed in a fairly structured manner, such as accounting reports monitoring tax matters according to rules established by law. Other reports are similarly structured by accepted accounting practice. Tasks such as measurement of sales potential requires more human judgment, but the ability of sales managers to deal with this less-structured context is often quite good, drawing upon expertise developed through experience.

There are, however, other contexts involving human beings that require organizations to operate with the need to gain understanding with less established frameworks of experience. The way in which humans manage to cope with the complications and uncertainty often found in their environment is to apply subjective analysis. Erdi (1996) noted that the human brain is a structurally and dynamically complex device, and thus is a hermeneutic device. Hermeneutic methods offer a way to gain understanding in such contexts. The use of four hermeneutic methods in supporting requirements analysis are compared in an analytic sense, as a precursor to empirical comparison to be conducted later.

Background to Hermeneutics

Hermeneutics is the art, or the science, of interpretation. Four influence authors have defined and used hermeneutics at different times in history. These are Schleiermacher, Dilthey, Heidegger, and Gadamer. The focus of this short write-up is on Gadamer (1976, 1986, 1992), so each of these philosophers will be presented as his work influenced Gadamer's.

Schleiermacher used hermeneutics in the early 19th century as a method to understand various texts, particularly religious texts. Schleiermacher used two different approaches to hermeneutics, a grammatical approach and a psychological approach. The grammatical approach emphasizes that the ability to understand language is common to all human beings. The human ability to understand language is based on our ability to understand language as an object with grammatical rules. The second method Schleiermacher uses is a psychological method. Schleiermacher believed that humans have the ability to view an object from another human's perspective and so understand that object from that same perspective. Schleiermacher also defined what is known as the "hermeneutic circle." The hermeneutic circle is a process which builds understanding. It begins with understanding small pieces of an object or an event. The understanding of these small pieces allows them to be placed into a larger context until a complete understanding is obtained. Later, interpretations of Heidegger (1962) defined the hermeneutic circle to be the "fore-structure of pre-given interpretation" (Grondin, 1991, p. 95).

Dilthey is also an influential figure in the history of hermeneutics. Writing in the mid-to-late 1900s, Dilthey developed a methodological hermeneutics. This method differentiates between explanation and understanding. To distinguish between the two words, we can use the type/token approach, although these are not the words which Dilthey used himself. Explanation of an object seeks only to define the general and common characteristics of that type. For example, all zebras can be defined as a type of animal which lives in Africa, has four legs, grazes, and has black and white stripes over its body. The token distinction identifies an individual instance of a type and seeks to explain that particular individual. An example of an individual zebra might be the dominant male of a particular herd (if indeed such an animal exists). Dilthey goes on to state that explanation of a type looks only at its external characteristics. Understanding of an individual of a type includes examination of the individual's internal characteristics. To complete the zebra analogy, the behavior of the dominant male, or its cognitive idiosyncrasies, would be included in the discussion of that particular token.

Heidegger wrote in the late 1900s to the mid 20th century. Central to his philosophy of hermeneutics are the concepts of fore-understanding and the notion of existence as participating in one's life in order to become oneself or "being there," the Dasein.

Hermeneutics as a Practical Philosophy

Gadamer defines hermeneutics as a practical philosophy. A practical philosophy is one which can be used in a practical manner and applied to the events of everyday life. In this way, Gadamer seeks to avoid hermeneutics from being devalued and "put away" from everyday life the way that art and poetry have been.

Gadamer's goal to define hermeneutics as a practical philosophy can be traced back to Aristotle's taxonomy of sciences. Aristotle divided the sciences into three different types, the theoretical, the practical, and the productive sciences. Theoretical sciences with its about dis-cover-ing the truth about the world around us is exemplified by physics, mathematics, and theology. I've hyphenated the word "discovering" as a bit of hermeneutic analysis. Practical science, which includes political science and ethics examines the world and tries to optimize its condition. Finally, productive science involves the building of skills and knowledge. Examples of productive science include the various engineering disciplines such as electrical, computer, and civil engineering. The difference between the practical and productive sciences is that skills can be taught, learned, and practiced irrespective of their impact upon, or ability to, improve the human condition. Practical science, with its inclusion of ethics, requires the thoughtful application of knowledge so that it contributes to goodness.

Gadamer's hermeneutics has a strong flavor of ethics because he seeks to improve the "human good." In particular, Gadamer writes about technology (applied knowledge) and practical science. Important to Gadamer's work are the notions of interpretive distance, temporal distance, historical consciousness, and prejudice.

All of these works, by Schleiermacher, Dilthey, Heidegger, and Gadamer describe the underpinnings of hermeneutics which allow hermeneutics to avoid relativist interpretations of a text and lead to the "true" understanding of the text.

Application of Hermeneutics

The hermeneutic idea has been applied in many areas. In terms of art, some internal coherence is identified by the viewer, representing some immortal truth. In jurisprudence, the American system assigns the judge the responsibility of being correct rather than arbitrary, thus requiring correct interpretation of the body of law in terms of the specific case. Hermeneutics matches the judicial process of filling in gaps in codified law through judgment. Current reports using hermeneutics in law include Feldman (1996) and Crosby (1998).

Some of the implications of hermeneutics is that our view of the world should be holistic, rather than the atomist view of logical positivism. That is precisely what general systems theory (von Bertalanffy, 1998) seeks to do, considering synergistic systems where the output of the whole is not simply the sum of the contributions of the component parts. The system focuses on an overarching goal, and system component goals make sense in this context only in terms of the common system goals.

Hermeneutics has been widely used in many fields relating to human behavior. Grimes (1992) credited hermeneutics with producing understanding and emancipation from the oppressive structure of outdated theory in organizational science. Erben (1993) reviewed extensions of the hermeneutics of Dilthey in the field of biography. Balfour and Mesaros (1994) wrote of the value of hermeneutics in moving public administration research away from methodological debates toward more practical focus on substantive issues.

Business Applications

Llewellyn (1993) called for hermeneutic circles within accounting research to link advances in methodology to implications on empirical accounting research, providing the possibility of understanding within that field. Arrington and Francis (1993) drew parallels between the hermeneutics of speech and writing with the hermeneutical horizon of the economic account, expanding the sense of what accounting is and is not. Hermeneutics has been applied in auditing (Francis, 1994), espoused as a means to recover moral and critical reasoning in a field where these human characteristics of understanding have been argued to be on the wane. In marketing, O'Shaughnessy and Holbrook (1988) called for the hermeneutic interpretation of consumer actions through protocol statements. Arnold and Fischer (1994) claimed that hermeneutics had the tasks of determining what a text has to say, and providing instructions about what to do, all in the context of consumer research. Brown (1995) reviewed the strain of hermeneutics in consumer and marketing research.

Ket de Vries and Miller (1987) gave two examples of hermeneutic interpretation in business contexts. In one of their examples, the president of a Canadian consumer goods firm decided on a program of major expansion and modernization, quadrupling the size of an underutilized production plant. Kets de Vries and Miller proposed tentative rules for interpreting text.

Table 1. Kets de Vries and Miller Rules for Interpreting Text

Thematic unity	Observations collected and shaped into an inter-connected, cohesive unit, seeking communality
Pattern matching	Structural parallels are sought between current events and earlier incidents
Psychological urgency	Somewhere in the text it is possible to identify the most pressing problems
Multiple function	Part of the text can have more than one meaning, and can be viewed from different perspectives

It is necessary to seek out meaning at multiple levels to determine the individual and organizational roots and consequences of actions and decisions.

Phillips and Brown (1993) cited critical hermeneutics as a methodology useful in analyzing attempts of organizational members to impose power and dominance, and demonstrated their contentions through a corporation's image advertising campaign. Hermeneutics provided a framework for analyzing organization texts. Their approach was applied by identifying social-historical moments, formal moments, and moments of interpretation-reinterpretation.

Table 2. Phillips and Brown Rules for Interpreting Text

<i>Social-historical moment</i>	Intentional aspect	Who produced the text Intended recipient
	Referential aspect	What text is about
	Contextual aspect	Text meaning in social & historical context
<i>Formal moment</i>	Conventional aspect	Conventions followed by the text
	Structural aspect	Text meaning due to structure
<i>Interpretation-Reinterpretation</i>		Gain insight from subjective understanding

A moment of social-historical analysis encompassed the first three characteristics of a text, its intention, its reference, and its context. A moment of formal analysis encompassed the conventions followed by the text, as well as its textual meaning. The moment of interpretation-reinterpretation drew on the first two moments to lead to understanding.

The Use of Hermeneutics in Information Systems

Qualitative approaches have long been applied in the field of information systems. Myers (1995) proposed dialectical hermeneutics as a theoretical framework for information systems implementation research. That same author (1997) reviewed

qualitative (hermeneutic) methods for the analysis of organizational issues in information systems. Klein and Myers (1999) noted the lack of conventions for the evaluation of hermeneutic information case studies, and provided a set of principles with philosophical rationale. Butler (1998) cited a paucity of information on the application of hermeneutics, and gave one overview of concepts and principles for the related fields of phenomenology and hermeneutics, and demonstrated with an application. Gould (1994) demonstrated the use of hermeneutics to the design of a geographic information system. Powell (1999) also discussed the application of hermeneutic methods in geographic information systems, in the context of library and information science. Boland (1994) proposed hermeneutics as a framework for better understanding the group process supported by group support systems. Trauth and Jessup (2000) compared a positivist approach to an interpretive (hermeneutic) approach to the application of a group support system for the analysis of issues within an organization. Standing and Standing (1999) applied dialectical hermeneutics in the analysis of the role of politics in the promotion of information systems professionals.

One of the major application areas has been systems development, especially with respect to requirements and risk analysis.

Systems Development Applications

Soft systems applications have been widespread in Great Britain (Checkland, 1981; Ormerod, 1995; 1996). The idea of the systems failure method (Fortune and Peters, 1995) directly applies soft systems to software project development. The idea of this entire genre of qualitative approach is to understand the underlying system, identify weaknesses (especially by looking at the experiences of the past in light of systems models), to design current systems with more robust characteristics. Kjaer et al. (1995) applied a hermeneutic approach to obtain more flexible system requirements. Butler and Fitzgerald (1999) used the critical success factor concept to hermeneutically study four systems development projects, obtaining more useful sets of critical success factors for that organization.

Other applications in the area of systems development include Tervonen and Kerola (1998), who compared three hermeneutic cycles in the incorporation of software quality principles in software design. Consideration of soft aspects were found to provide deeper understanding of software quality issues.

Knowledge Management

The emerging field of knowledge management involves the application of powerful new technological tools. The ability to store masses of data content have been developed. However, there have not been parallel increases in the abilities of humans to absorb and digest this information. Therefore, attention is needed in ways to utilize computers to allow humans to concentrate on the important bits of data available, as well as to mine massive data warehouses and related products.

Chalmers (1999) applied philosophical hermeneutics to the problem area of information retrieval and filtering. Lee (1994) studied the information content of electronic mail through hermeneutics, discussed in greater detail below.

Demonstration of the Use of Hermeneutics in Information Systems

Lee (1994) demonstrated the use of hermeneutics to study the impact of e-mail as a communications medium. The research focus was on the richness of e-mail communications, with the contention that communication richness was not a function of communication medium, but an emergent property of the interaction between communication medium and organizational context. Hermeneutics was used because while information richness theory considered numeric documents to be the leanest form of communication media, there was evidence that numeric documents were rich in meaning for the people reading them. Hermeneutics provides a framework for the study of meaning. A second reason for the use of hermeneutics was that e-mail consists of text, the traditional domain of hermeneutics.

Lee based his hermeneutic study on five concepts, based on Ricoeur (1981) and Boland, et al. (1991):

Lee stated that these five concepts have important ramifications for research on e-mail as a medium for managerial communication. E-mail's transcription, delay, and other features may lack capability for immediate feedback, filter out significant communications cues present in face-to-face conversations, and reduce language variety. However, e-mail communication can be rich through distancing, autonomization, social construction, appropriation, and enactment.

Table 3. Lee Concepts for Interpreting Text

Distanciation	Separation in time and distance between a text & author and the intended audience
Autonomization	Text taking on a life of its own
Social Construction	The world manifested by text meaning – various views of the world shared by particular groups or societies
Appropriation	The subject internalizing some view
Enactment	The subject grasping meaning from the communication (Weick, 1969)

E-mail of a corporation in the risk management industry was analyzed by Lee. A seemingly innocuous e-mail from a clerical employee generated a complex series of messages on the part of higher managers seeking to position their organizations in the best possible light.

We present a fourth hermeneutic method based on the work of Gadamer. Gadamer (1976) defined hermeneutics as a practical philosophy, one which can be used in a practical manner and applied to the events of everyday life. In this way, Gadamer sought to avoid devaluing hermeneutics and putting it away from everyday life in the way in which art and poetry have been.

Table 4. Concepts for Hermeneutic Interpretation Based on Gadamer

Interpretive distance	Gaps in understanding
Temporal distance	Time between experience and implementation
Historical consciousness	Connection of current issue with past contexts
Prejudice	Starting point of interpretation

We use Gadamer's method of interpretive distance, temporal distance, historical consciousness, and prejudice. Interpretive distance is the space existing between the interpreter and the text, object, or event. Temporal distance is the time that elapses between the genesis of the object and its experience by the interpreter. An adequate explanation of temporal distance is the time lapse between the occurrence of an event and the time when the event is remembered. Historical consciousness relates to the interpreter connecting currently considered situations with past contexts. Prejudice is literally a "pre-judgment" or a preformed opinion. In the context of Gadamer, the notion of prejudice is necessary to understanding because it provides a context through which a new, or enhanced, event can be experienced. Finally, historical consciousness is the experience of a past event within the context of the present time.

Method Comparison

The method of Kets de Vries and Miller (1987) begins with clustering observations into groups, seeking cohesive thematic unity among clusters. Then patterns are sought between current events and earlier incidents. Those triggers that led to problem identification were labeled "psychological urgency." This method realized that textual elements could have multiple meanings based upon different perspectives. The Kets de Vries approach follows the process of events, focusing on problem identification and how it was dealt with.

The Phillips and Brown (1993) approach organized the hermeneutic study into aspects, beginning with who produced text and for what purpose, then identifying what the text referred to, its context, the conventions followed, and the meaning of the text. This approach is more of a checklist of textual characteristics.

Lee (1994) followed the life of a piece of text, following the framework of Weick (1969). A text's creation in time was identified, and various views of particular individuals were traced, to include internalization by subjects, and finally the grasping of meaning on the part of the subject.

The fourth method proposed here, based on Gadamer's work (1976), considers the distances in distances of ideas and time, as well as historical consciousness and prejudices. This provides an additional frame within which patterns may be identified.

All four of these approaches are viewed as supplemental, working together to aid the systematic examination of subjective material, leading to more complete interpretation and understanding.

Conclusions

Information systems operate in a human world, within organizations consisting of people. A logical positivist view is attractive to scientists and engineers, who prefer objective measures of things in a world without random behavior. However, people behave based upon context. We all bring a myriad of histories and experiences, as well as moods for particular times when communications occur. A logical positivist view of the world provides no basis for understanding organizational communication. Hermeneutics does.

This concept has been successfully applied to many IS contexts, including those reviewed here. Hermeneutics provides a framework of iterative examination of events. This iterative examination often leads to expanded understanding and discarding of preconceived stereotypical notions. It is in this fashion that hermeneutics often leads to truth and understanding.

The use of four hermeneutic methods in supporting requirements analysis were compared in this paper an analytic sense. These methods, which have proven useful in a variety of contexts, are proposed as methods to support the interpretation of subjective text.

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