A Hermeneutic Approach to the Notion of Information in IS

WANG SU-FEN

Glorious Sun School of Business & Management

Donghua University

Shanghai 200051

CHINA

LIN CHUN-MEI

Department of Computer

Shaoxing College of Arts and Sciences

Shaoxing Zhejiang 312000

CHINA

FENG JUN-KANG

School of Computing

University of Paisley

High Street, Paisley PA1 2BE

UK

Abstract: - In the field of information systems (IS), 'information' is probably the most important and fundamental notion. And yet, existing studies of it seem inadequate and lacking of sufficient depth, and further work is therefore desperately in need. We adopt Hermeneutics to approach the essence of information. We describe how Hermeneutics might enable us to look at the mechanism whereby information is created and information flow takes place, and explain implications this approach might have to requirement identification in IS.

Key-Words: - Essence of Information, Hermeneutics, Philosophy of Information, Information Systems

1   Introduction

Arguably 'information' is probably the most fundamental and the most important concept for information systems and information science [1]. Boland maintains that since the very beginning of the emergent discipline of information systems, research on information systems has suffered from the elusive nature of information and the lack of methods and techniques for handling the essence of information, and points out that how well this problem is addressed has profound impact to all aspects of information systems – the research, development and use of information systems, both in theory and in practice [1]. This is one hand. On the other hand, there are various forms about such key concepts as *information, data and meaning* ([2],[3],[4],[5],[6]). These concepts and terminology are often isolated, disjoint, and form an often contradictory amalgam of knowledge and cause confusion in research. Therefore, 'How to understand and to deal with the essence of information' would seem to have become an important and tough problem for the discipline of IS.

We aim to tackle this problem. We put forward a new approach to this problem by using results of 'information philosophy' in Section 2. We suggest and explain the general process of information realization based on Hermeneutics in Section 3. In the final section, we give some concluding remarks about the work to be presented in this article and

explain implications this approach might have to requirement identification.

2 A new perspective on the essence of information

We suggest using results of research in 'information philosophy' ([7], [8]) in recent years thereby to formulate a new perspective for approaching the problem of 'information'.

The new perspective is to understand and engage the essence of information from 'why information is called information in the first place' through investigating the relationship among information, data and meaning. In particular, new meaning is created through a specific type of activities and behavior, called *interpretation*. That is, we observe that in order to understand the essence of information we adopt a perspective that information in IS can only be created through practice and being engaged through interpretation. This is the pivotal point of the ideas that we develop in the paper.

We believe that information is carried by non-empty, well-formed and meaningful data [8], and an information system is a social system making use of IT. Thus the relationship among information, data and meaning can only be explored through communication and negotiations between humans. It is conducted within the never-ending cycle of '*information* is carried/embodied/projected by *data*; *meaning* is created from information through *interpretation* of data; then further information may be created due to the *intention* of a human agent, which is again carried by *data*' Through communication and negotiations between them, people obtain understanding of the world around them and of themselves. So, 'why information is called information in the first place' must be considered form the viewpoint of human's existence.

The process above is that of information (impact) realization, and the associated mechanism is that of information realization. On the one hand this process captures the relationship between information, data and meaning. On the other hand, this process is accomplished through the interaction between the three. We believe that information is independent of informees (the receivers of information), borrowing Floridi's term [8]. But we also believe that the impact of information, which is concerned with the reason why a piece of information can be seen as such, namely due to its capability of informing, can only be materialised through the interaction between the three, i.e., information, data and meaning. This entails the involvement of human agents within the process, or the interpretation/creation of meaning. Information realization is concerned with how people use information, and how information supports people who need information. Therefore the process of information realization becomes a process of meaning interpretation and realization.

The informing process through accessing information is that of interpreting the meaning of information for the informee in the sense that what the information means to him/her. It would seem that this has not been adequately addressed. Furthermore, exploring meaning would seem a basic problem for hermeneutics. In the sections that follow, we will put forward a proposal on how a mechanism for exploring meaning might look like by drawing on hermeneutics.

3 A hermeneutic approach to the problem of information in IS

3.1 The general process of 'information realizing' mechanism

Hermeneutics is the study of interpretation. Hermeneutics emerged as a concern with interpreting ancient religious texts and has evolved to address the general problem of how we give meaning to what is unfamiliar and alien([9],[10], [11]).

In the context of IS, data, information and meaning are in a state of co-existence. Information is borne by data, and meaning is created due to reception of information through looking at data or interpreting data. Thus these data are in the position of the target, i.e., 'text' in Hermeneutics.

We consider information systems as social systems that are technically and technologically implemented, so, we adopt Ricoeur's Hermeneutics as the theoretical foundation for our investigation into the mechanism that enables the realization of information and information flow within the context of information systems([10]).

Ricoeur combines ontological Hermeneutics with methodological and epistemological Hermeneutics through linking Hermeneutics with the text theory.

The general process of information and information flow realization (see Fig.1) may be seen as having three stages, namely the Semantics Layer, Reflection Layer, and Ontological Layer. Each of the layers is connected with the 'text' (i.e., data) of the information system. The transformations between the three layers embody those between objective meaning (in the sense of being independent of the receiver of information), inter-subjective meaning and subjective meaning.
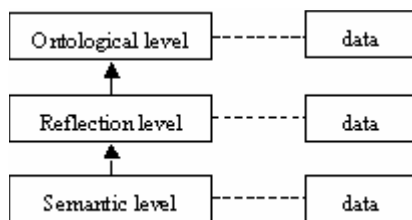

Fig. 1 The general process of information realization

3.2 An analysis of various elements in the 'information realizing' process

3.2.1   Data analysis
With Hermeneutics, data in information systems are read and interpreted as texts. We give data here slightly different characteristics from those that appear in more 'general' research of information systems([6], [8], [9]).

We think that data links information and meaning, which enables the communication between people. Through communication, people acquire self-understanding. Thus data should have the following characteristics:

(1) Data are fixed life expressions by being written. They have multiple meanings and multiple layers of meaning. There are literal meaning, sender's meaning, hidden and latent meaning produced by various factors, such as the multiple traits of literal meaning, the knowledge background and psychological factors of the sender and so on.

(2) There is a dialectic relation between the sender's meaning and the meaning that may be seen as inherent to the data([14], [15]).

(3) Meaning created through information carried by data and the relevance of data is derivative from the dialectic relation between data and its receiver.

(4) Data is not limited by their direct references; data enable people to enter a possible world from a given one, i.e., the data world.

Therefore, the process of information realization is a process of interpretation of multiple layers of meaning and that of realization of multiple meanings. This in turn enables data to have their complex characteristics as just discussed.

3.2.2   Semantic analysis
The analysis of the information content of data, through interpreting the data, we can obtain objective information content carried by the data. The objective information content is taken as the meaning that the sender of the data wishes the data to carry. So 'objective' here means being independent of the receiver of the data. Data may have various meanings, such as the literal meaning, which may in turn refer to a particular event.

Literal meaning is the direct and basic meaning, and the others are indirect, second or metaphoric meaning. These indirect meanings are nested within the direct meaning. This is similar in a way to information nesting [12].

We begin to interpret data that have multi-stipulations. But every kind of interpretation

is based on its own frame of reference in order to seek agreement with the rich and multi-vocal meanings of data. The interpretation process of data is illustrated in Fig. 2.
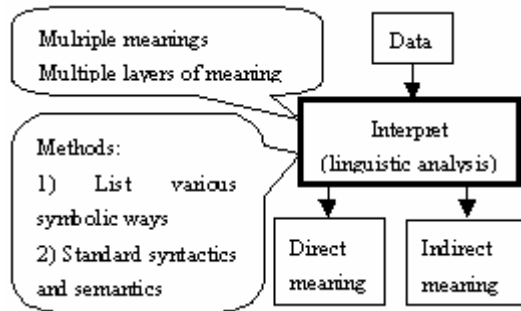

Fig.2 The process of linguistic analysis

3.2.3   Reflection layer

The information forming process embodies the communication between people by means of the inter-relationship of data, information and meaning. Its goal is for people to achieve understanding of themselves by communicating with one another.

Thus our interpretation of data is not just the understanding of the information content that is carried by the data, but also the meaning of the sender of the data. The purpose of this is, through understanding the sender's meaning, to ascertain what world we ourselves are in, and make sure of what 'I' am, and what I should do. This is self-understanding, to achieve which there has to be a process of reflection.

Reflection is of course self-reflection, and not a concrete reflection on a particular event. Reflection is a process of transforming the 'otherness' of the data into an 'utterance event' for me. The receiver's 'utterance event' is a new event, that is, it is not the repetition of the ''utterance event' that created the data in the first place, but is new creation according to the requirements of 'speaking'. This way, the interpretation of reflection is completed. Thus, self-understanding is realized through reflection.

Reading links two incidents of speaking: data as utterances, and reading as new utterances. Ricoeur makes use of Gardmer's 'fusion of horizons' to refer to the widening of the understanding of the subject after she/he has entered the world of data.

We place data at the position of a production medium. Through the interpretation cycle, more meaning is obtained; and through 'fusion of horizons', self-understanding is achieved.

Reflection process is completed through reading data and conversing with data, and reading through 'fusion of horizons' and game-playing.

3.4.4   Ontological layer

After reflection, self-understanding comes into being according to the form in which it can exist, and it creates new data. This is not an end, but the beginning of a new cycle. This process of information realization and information flow constitute a basis of exchange between human being.

4 Concluding remarks - Implications to Requirements Identification for Information Systems

Through semantic interpretation of the semantic layer, the receiver obtains the information content of the data sent by the sender. Much of the information content exists in the form of being implied and implicit, through obtaining which the receiver obtains her/his understanding of the sender. Through assimilation via reflection, the receiver strives to find the way to further understanding her/himself, namely to make something 'alien' to be of his/her own. Then on the ontological layer, the receiver expresses his/her own utterance with new data. Through such a never-ending cycle, human exchange is achieved, which in turn enables us to increasingly understand ourselves (see Fig. 3).
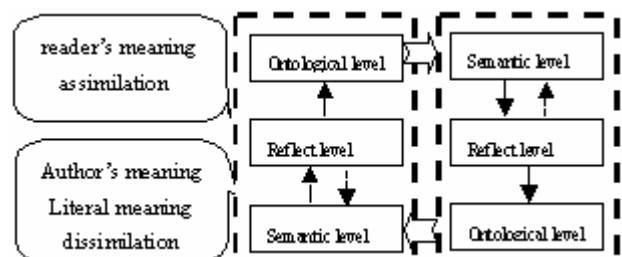
Fig.3 The communication pattern between subjects

Our work along this line seems to have implications for the identification of requirements in IS. There are three problems concerning requirements of IS, namely,

♦ *The content of IS requirements by the user*

♦ *How required information is identified, and*

♦ *How data that an IS will actually store and process are identified.*

These can now be looked at within such a never-ending Hermeneutic cycle. The content of information requirement from the point of the view of the user would now be what is needed for her/him to understand her/himself in the context of using an IS to approach and complete her/his tasks and the meanings that are subsequently produced. The required information should be identified through the stages of semantic understanding, reflection and ontological realization. Finally, the data that an IS processes should be among the original set of data and the new data. These can be seen in Fig 4. To work out the details of how a mechanism for analyzing information and information flow within the context of IS would require much more work and it is therefore beyond the scope of this paper.
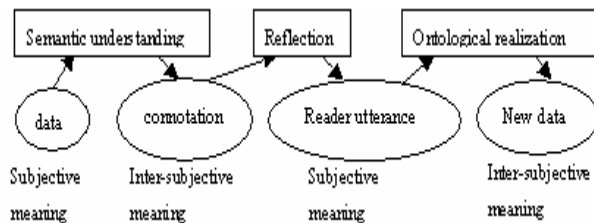

Fig.4 How to identify the required information through the stages of semantic understanding, reflection and ontological realization.

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