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RELATING ORGANIZATIONAL LEARNING AND INFORMATION SYSTEMS: A PRELIMINARY STUDY

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ABSTRACT

This paper is a contribution for closing the much undesirable gap between organizational learning and information systems. To do this, it takes a number of key concepts from a well established information systems framework and shows that, if the ambiguity of those concepts is restricted, they can be used to describe organizational learning in terms that, though originating from information systems, fit perfectly an existing reference framework for organizational learning. We suggest that further research, emphasizing shared terminology and concepts, may strongly contribute to strengthen the relevance of information systems for organizational learning and of organizational learning for information systems.

INTRODUCTION

Organizational learning is, today, a crucial element for any organization wishing to adapt to change continuously and quickly (Prokesch, 1997). Many studies on organizational learning, originating from a variety of areas, have been produced over the years. However, and in spite of this variety, the relationship between organizational learning and information systems still remains unclear. With this in mind, Argyris recommended, twenty years ago, "an alliance among line executives, MIS (Management Information Systems) professionals, and behavior scientists to conduct research on how to develop MIS that are more effectively implementable" (Argyris, 1977b, p. 128). We notice, however, that more recent literature recognizes that this alliance has not been achieved. For instance, Balasubramanian (1996) states that "there has been very little research on the influence of technology, especially information systems, on organizational learning" and that "there is a general agreement among researchers that organization theorists and information systems researchers need to come together to explore this topic further". Along the same lines, Dejnaronk (1998) observes that "Although business IT [Information Technology] value and its impact on firm's knowledge are recognized, little effort has been made to study the relationship between the two".

In a broader sense, and as far as information systems are concerned, this is an old problem. It has always been difficult to establish links between organizations and their needs, on one end, and information systems and information technologies, on the other. We believe that a basic reason for this difficulty has been the lack of communication and of an appropriate common language. Just to give an example, we see the term "knowledge" being used with completely different meanings to satisfy quite varied conveniences. How could a term suffering from such semantic vagueness be fully understood and shared?

The main objective of this paper is to contribute to an approximation between organizational learning and information

systems based on shared terminology and concepts that serve the needs and aims of both parts. Our main concern could, thus, be phrased in a single question: how can we relate organizational learning and information systems? The studies that get closer to this concern have tried, essentially, to identify the ways in which information systems can support or stimulate organizational learning. For instance, Balasubramanian (1996) makes "an attempt to identify aspects of organizational learning that can benefit from the use of information systems", by concentrating on the direct influences of information systems upon organizational learning; Croasdell (1997) analyses "the role of information technology in supporting these [memory, learning] cognitive structures in organizations"; Sohn (1998) "explains how information systems provide competitive advantage in terms of organizational learning"; and Vance (1998) studies the relationship between knowledge transfer and information systems.

We notice that those studies do not address the information systems perspective of the problem. In practice, they concentrate on information technologies rather than on information systems. We think that we need to work on the key concepts of organizational learning in such terms that they can be brought together with those from the field of information systems. Conversely, we think that the information systems concepts must be brought together with those relating to organizational learning. This paper attempts to close the gap while serving both sides. To do this, it starts by addressing the question of "organizational learning" versus "learning organizations", and then attempts to relate organizational learning and information systems using a definition of organizational learning that is expressed in terms of information systems.

ORGANIZATIONAL LEARNING VERSUS LEARNING ORGANIZATION

A multitude of visions and concepts regarding organizational learning can be found in the literature, led by the influential work of

Argyris & Schön (Argyris, 1977a; Argyris, 1978; Argyris, 1996) and Senge (Senge, 1990; Senge, 1994). Excellent reviews of the literature can also be found (Fiol, 1985; Huber, 1991; Dodgson, 1993; Garvin, 1993; Cohen, 1996). One of the most recent ones has been produced by Argyris and Schön (1996, pp. 180-199) in a context that places their theory of productive learning within this multitude of visions. They claim that two branches exist in organizational learning. The more scholar branch is usually referred to as Organizational Learning. It is usually cultivated by academics, it is generally skeptical, "intentionally distant from practice, nonprescriptive, and value-neutral" (Argyris, 1996, p. 188). The other branch, that of Learning Organizations, where Senge became widely known, is practice-oriented, value-committed and prescriptive. We support Argyris & Schön in their opinion that the two branches are complementary and non contending.

In this paper, we adopt the expression "organizational learning" with the meaning that has been proposed by Huber (1991). Huber established a four process framework for organizational learning: knowledge acquisition; information distribution; information interpretation; and organizational memory. This framework seems to be particularly appropriate as a basis for relating organizational learning with information systems, as some authors have already suggested (Balasubramanian, 1996; Sohn, 1998).

ORGANIZATIONAL LEARNING AND INFORMATION SYSTEMS

To serve the aims of this paper – and in agreement with the FRISCO conceptual framework that we will be referring to below – we say that an organization learns when, through its members, distributed data are interpreted and become information. Information is the knowledge increment afforded by data interpretation. Thus, when an agent sends a set of data, in a message, to some receiver(s), it is providing the acquisition of knowledge, that is, it is making learning possible. Thus, we cannot say that an agent sends information, but

rather that it sends data containing an information potential that may become real through interpretation.

This approach lets us establish the concept of organizational learning from the concept of information and some related concepts that lay at the very heart of the concept of information system. The definition of the concepts that we have just used has been borrowed from the information system community, namely from *The FRISCO Report - A Framework of Information System Concepts* (Falkenberg, 1998), and it is particularly relevant in our context because information is a key concept in relating organizational learning with information systems.

Information is formally defined in that report as "the knowledge increment brought about by a receiving action in a message transfer, i.e. it is the difference between the conceptions interpreted from a received message and the knowledge before the receiving action". Thus, data can only become information: a) when a message containing the data is actually received by the intended receiver or receivers; b) when the receiver or receivers interpret the data; and c) when, for each receiver, the interpretation results in a knowledge increment. Thus:

- sending a message with data does not necessarily mean that it will be received;
- the fact that the message is received does not necessarily mean that it will be interpreted;
- the fact that the message is interpreted does not necessarily mean that, for each receiver, there is a knowledge increment;
- in case the interpretation leads to new knowledge for more than one receiver, this does not mean that the resulting knowledge will be the same for the different receivers.

When the knowledge acquired is "identical (or at least similar) to that of the others, as resulting from the negotiation process implicit in some communication" (Falkenberg, 1998), then we are in the presence of shared knowledge, which is thus a subset of the individual knowledge for each one of the receivers.

So far, we saw that it is possible to establish a connection between organizational learning and information systems using concepts from the domain of information systems. In particular, we have used the concept of information and other related concepts, such as data, message, communication, knowledge, and shared knowledge, borrowed from *The FRISCO Report.*

The definition of organizational learning that we have presented above, though supported by information systems concepts, agrees with the organizational learning framework proposed by Huber (1991) in the sense that it takes into account three of the four key processes of organizational knowledge: knowledge acquisition, information distribution and information interpretation.

These three key processes cover, essentially, the components of processing (knowledge acquisition and information interpretation) and communication (information distribution) of an information system. Interestingly enough, the key process of Huber's framework that remains to be considered – organizational memory – coincides with the component of an information system that we still need to take into account: the memory. Indeed, for an organization to be able to learn, in the sense that we have been considering, a memory systems is needed, to let us store and retrieve:

- the data associated to individual knowledge. If the knowledge embedded in those data is to become knowledge for some other individual, it must be sent as data in a message, using a communications mechanism, and it must be interpreted by the receiver, that will thus acquire knowledge (though there is no guarantee that the acquired knowledge is the same that was embedded in the data);
- the data associated to shared knowledge. For this knowledge to be shared, its encoding must have a low level of equivocal potential, i.e., there must be a high probability that the acquired knowledge be identical, at least as far as the interest of the organization is concerned;
- the data associated to organizational knowledge. These data are linked to the whole organization, and consist of meanings and shared values, policies, beliefs, norms, etc.

For organizational learning, the use and value of the data stored in the memory system is richer: the higher the meaning is; the bigger the identification of the associated context is; and the deeper the social aspects embedded in the data are.

For example, let us consider an individual charged to write and store in organizational memory the report of a team meeting. He can do it in several different ways. He can make a written report of just the key points of the discussion and of the decisions taken. If he adds some notes and comments on the most important points of the meeting, namely notes and comments that allow a deeper understanding of the meaning of the discussion and of the decisions taken, the report is potentially more useful. If he adds even more data on the context in which the discussion takes place and the decisions are made, then the value of that report increases even more. Its value may reach the top if it includes a sociological view of the context, that is, if the whole report contains values, norms and other social aspects of the organization.

CONCLUSION

On this preliminary study we have shown that it is possible to describe in information systems terms how an organization learns. We have based our description on a leading concept, the concept of information, and on other related concepts, such as data, message, communication, knowledge, and shared knowledge. We have borrowed the definitions of those concepts from an information systems framework – *The FRISCO Report* (Falkenberg, 1998) – and we have shown that this description, though made in terms of information systems concepts, was easily related to Huber's four-process framework for organizational learning (Huber, 1991). We strongly believe that further research promoting a deeper sharing of terminology and concepts between the two areas will significantly influence the relevance of information systems for organizational learning and strengthen the implications of organizational learning for information systems.

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