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The Impact of Organizational Memory on IT Systems

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Abstract

Organizational Memory Information Systems (OMISs) combine the attributes of culture, history, business process, human memory and fact into an integrated knowledge based business system. While not currently in existence in the configuration suggested in this paper, this type of information system would be an integral part of any firm wanting to anticipate business climate changes, expand their customer base and improve existing customer service. OMIS's would benefit businesses wanting to integrate disparate data bases, capture the expertise of retiring staff, improve organizational coordination and provide a decision making aid to staff members encountering new and complex issues requiring the integration of diverse and inconsistent types of knowledge.

Introduction

Knowledge Management (KM) is a high priority with many businesses today wanting to leverage a firm's core competencies. The Delphi Group (Boston) defines KM as the ability of an organization to leverage its collective wisdom to increase innovation and responsiveness. Wisdom is the end result of collecting data, grouping the data into meaningful patterns (information), collating known information with the familiarity of experience, and finally coupling what is true or right with good judgement. There is no doubt that firm's use IT to collect information and attempt to exercise good judgement in its application. However, it is the ability to link information with experience where IT has only recently been applied. An Organizational Memory Information System (OMIS) combines the attributes of culture, history, business process, human memory and fact into an integrated knowledge based business information system. It also includes developing and sharing knowledge with vendors and customers. Relational or object-orientated databases form the frameworks that link users, facilities and their inherent knowledge together to leverage a firm's core competencies. They are all pieces of a technological milieu of hardware and software that eventually could become an integrated (OMIS). This paper will discuss the relationship between Organizational Learning (OL) and Organizational Memory (OM) and then present an OM structure needed to define an OMIS architecture.

Organizational Learning (OL)

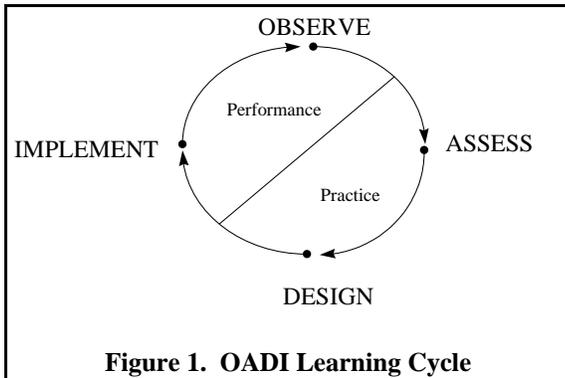
A learning organization should be capable of collectively understanding itself including the ability to learn from the individual experience. Knowledge management goes beyond individual experience to include issues like access to knowledge, technologies used by the firm, transfer of knowledge, non-technological means of transferring knowledge (teams and networks), and the ability to gather critical (customer and competitor) information and transform it into information that has value (Wiebler, 1997). Chevron developed an IS that shares refinery information and knowledge acquired by engineers and technicians over the years in six similar plants in geographically dispersed locations to optimize best practice and avoid reinventing the wheel.

A learning infrastructure should allow workers to step out of the KM system and work "on" it and not just "in" it. However, there must be a bridge between performance (working in the system) and practice (working on the system). That is, knowledge employees should be able to receive the benefits of a KM system but also participate in changing the system if they are not receiving benefits. The learning cycle of Observe, Assess, Design and Implement (OADI) (Figure 1) links these two processes together. During the *Observe* stage, information is gathered along with relationships and conflicting opinions. The *Assess* stage requires the knowledge worker to determine the correctness of facts and relationships (experience). The *Design* stage develops alternative solutions to the problem at hand and the *Implement* stage selects a solution and puts it into practice (wisdom), at which point, the cycle begins anew (Kim, 1995). At Chevron, the OADI cycle allows each plant to benefit from the positive experiences of other plants in developing new processes and then sharing their wisdom with the other chemical plants.

Organizational Memory (OM)

Organizational memory can be defined as the means by which knowledge from the past is brought to bear on present activities, thus resulting in higher or lower levels of organizational responsiveness. The defining processes of OM are acquisition, maintenance, retention, and retrieval (Stein, 1995). Acquisition gathers the data, information and knowledge from all available sources. This should be thought of as acquiring new information not already being maintained by the maintenance process (relational or object-oriented databases). Retention is perhaps the most important component of OM. Retention of organizational information can be classified into three main categories: schema's, scripts, and systems. A schema is an individual cognitive structure that helps people organize and process information effectively. Schema's can be thought of as obvious groupings of people, places and things. Scripts describe the appropriate sequencing of events in conventional or familiar

situations. Systems are groupings of individual and organizational scripts integrated through communication. Retrieval provides organizational memories in a timely manner to support decision making and problem solving. The Body Shop (a UK cosmetics firm) expanded internationally by upgrading its image of selling not only environmentally safe products but also high quality products. They revised their US marketing strategy to compete more effectively with sleek minimalist products by coordinating organizational memory structures as sets of inter-related elements either directly or indirectly.



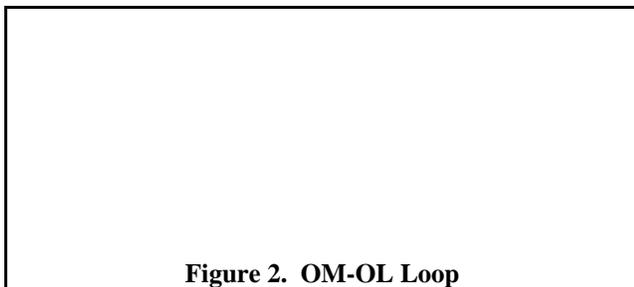
Walsh and Ungson theorized that the acquisition and retention of information could be stored in five bins. These five bins are labeled Individuals, Culture, Transformations, Structures and Ecology (Walsh and Ungson, 1991). Human intelligence combines all the bins together making the development of separate but equal systems difficult. OMIS technologies must store direct experiences and observations of individuals in a suitable format that matches individual cognitive orientations and value systems. Activities in this context refer to the decision making, organizing, leading, designing, and controlling, communicating, planning, motivating, functions of the management process. Wisdom is an awareness of the efficiency and effectiveness of different courses of action in producing outcomes based upon experience maintained in the OMIS database. Anderson Windows uses an OMIS that connects retailers and distributors to the factory allowing customers to custom design windows, determine accurate price quotes

and for Anderson to build unique windows with a minimum of inventory from a repository of previous customer orders and manufacturing capabilities.

Organizational culture is a learned way of perceiving, thinking and feeling about problems that are transmitted by members of the organization to the organization. Past experience has a direct bearing on issues to be faced in the future. Transformations are business processes within the firm that occur frequently. There is a predictable logic that flows from a standard input to an expected output. Organizational structures must be considered in light of their implications in individual role behavior and their links with the environment. Individual roles provide a repository for organizational memory. Power positions or positional authority all impact how information is stored or interpreted. These positions represent informal and formal rules of behavior that help put information in a situational context.

Ecology is the actual physical structure of the organization. It also represents how members of the organization feel about the organization and how people outside of the organization view a particular firm. Anderson Windows had a long history of superior customer service and was prompted to change when organizational impairments caused late deliveries and the delivery of wrong materials to customers. Organizational knowledge helps decision-makers use their experience to choose appropriate courses of action to achieve goals. To this end, four types of informational knowledge can be identified that contribute to our understanding of OM.

Suggestive information is evocative and weakly points the way toward a particular course of action. Predictive information strengthens the argument for a particular course of action by providing evidence of correlation or causality. Decisive information puts an end to the controversy by producing unequivocal evidence to support attainment of the decision makers goals through certain courses of action. Systemic information reminds the decision-maker to consider the impact of the decision on the system. If we categorized the contents of our OM in this way we could assign people, software and hardware to manage particular software and hardware projects.



Combining OL with OM (Figure 2) creates a special type of information (knowledge) because this information does not depend upon interpretation between receiver and sender. It is explicit communication. Implicit communication infers the meaning of the message without knowledge of the context of the original message.

In this context, OM can be characterized as learning versus unlearning, flexibility versus stability, or human resources versus information technologies. These comparisons are essential to planning, communicating, decision making and information processing within organizations (Stein and Zwass, 1995).

To distinguish between these dichotomies, organizations must learn and profit from past experience. These collective experiences serve to create a firm's personality and corporate culture impacting how an organization functions. Successful firms form links across traditional functional lines to gain access to previously hidden resources. The result can be a successful firm that embraces change or fails to see the future and falls by the wayside.

OMIS Structure

The crucial difference between information and knowledge is the ability to match information with a particular set of circumstances that actively promotes innovation and responsiveness to customer needs. There are four basic applications of KM technologies that promote innovation: externalization, internalization, intermediation and cognition (Frappaolo, 1998). Externalization is the process of capturing knowledge repositories and matching them to other knowledge repositories. Internalization seeks to match bodies of knowledge to a particular user's need to know (transfer of explicit knowledge). Intermediation matches the knowledge seeker with knowledge by focusing on tacit knowledge or experience level in the organization. Cognition is the function of business systems to make decisions based on available knowledge by matching knowledge with firm processes.

Figure 3 shows the integrating structure of an OMIS architecture that captures the concepts of organizational memory, organizational learning, strategy, and knowledge management. While not discussed previously, strategy (Porter's five forces) is directly related to a firm's core competencies and is an important part of any OMIS because it provides an additional framework to gather and store information. Only information that can contribute to the OMIS knowledge base should be retained.

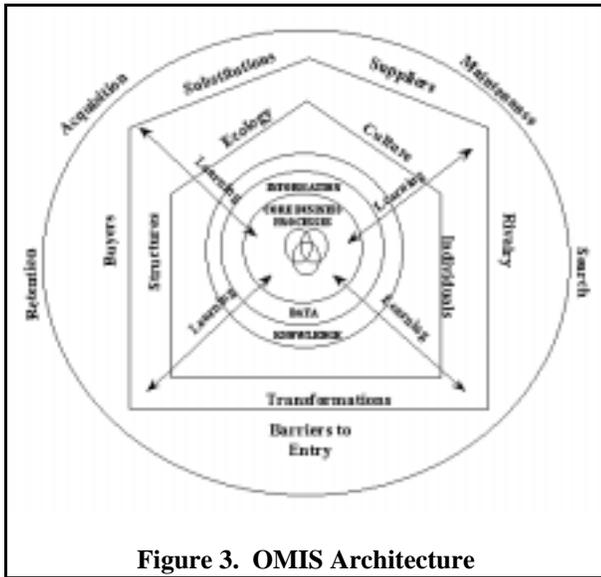


Figure 3. OMIS Architecture

KM will continue to evolve as a concept and the building OMISs represents only one way in which IS professionals might operationalize the concept. Senior executives understand the need to retain and utilize the knowledge inherent within an organization's memory however they will remain skeptical of any IT not producing results. Future research should use exploratory research methods to seek out learning organizations with OMISs and determine which OM attributes are being used and their relative success.

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