DOCUMENT RESUME

ED 474 092 IR 058 643

AUTHOR	Miller, Les L.; Nilakanta, Sree
TITLE	A Committee-Based Model for Supporting Organizational Knowledge Management.
PUB DATE	2001-00-00
NOTE	11p.; In: Proceedings of the International Academy for Information Management (IAIM) Annual Conference: International Conference on Informatics Education & Research (ICIER)(16th, New Orleans, LA, December 14-16, 2001); see IR 058 630.
AVAILABLE FROM	For full text: http://www.iaim.org.
PUB TYPE	Reports - Descriptive (141) -- Speeches/Meeting Papers (150)
EDRS PRICE	EDRS Price MF01/PC01 Plus Postage.
DESCRIPTORS	Administration; Business Administration; *Committees; Corporations; *Data Collection; *Information Management; Information Sources; *Models; Organizational Development; Organizational Objectives
IDENTIFIERS	*Knowledge Management

ABSTRACT

Organizations are looking at ways to manage their information resources. Both the capture and the use of data created by the organization have come under scrutiny. Part of the concern comes from their desire to enhance the business process and part comes from the explosion of data available to any organization. In this context the role of committees is being examined both as consumers and producers of information. This paper looks at making corporate knowledge more useful to organizations by focusing on supporting committees. The paper presents a knowledge management model and briefly looks at the prototypes used to test the feasibility of the model. The model takes a committee-based approach and uses committee meetings as the primary data collection point. The assumption is that more traditional forms of data (databases, data warehouses, and report libraries) are easy to generate and the major concern is to incorporate them in with the knowledge management process. Includes one table and five figures: relationship between components and organizational memory; block diagram of a typical problem domain; capture phase of the recorder; current capture tool screen; and organization of post capture tool in current implementation. (Contains 18 references.) (Author)

A COMMITTEE-BASED MODEL FOR SUPPORTING ORGANIZATIONAL KNOWLEDGE MANAGEMENT

Les L. Miller
Iowa State University

Sree Nilakanta
Iowa State University

ABSTRACT

Organizations are looking at ways to manage their information resources. Both the capture and the use of data created by the organization have come under scrutiny. Part of the concern comes from their desire to enhance the business process and part comes from the explosion of data available to any organization. In this context the role of committees is being examined both as consumers and producers of information. The present work looks at making corporate knowledge more useful to organizations by focusing on supporting committees. We focus on presenting our knowledge model and briefly look at the prototypes used to test the feasibility of our model.

INTRODUCTION

Knowledge is rapidly becoming a key organizational resource and determinant of organizational performance and competitiveness. Knowledge is the currency of wealth. Knowledge arises out of best practices, traditions, cultures, and other information. Knowledge can be classified into several forms, for example, tactile, syntactic, semantic, and strategic. Whatever the form of knowledge a firm has, unless it is managed properly, there can be no benefit or strategic advantage. Consequently, knowledge management is a process that organizations employ to improve performance. Knowledge management, however, is best described as a concept that explains how information is transformed into actionable knowledge and made available to users. Knowledge management enables businesses to avoid repeating past mistakes, to assure the reuse of best practices, and draw on the collective wisdom of its employees past and present. Knowledge management thus relies on gathering, organizing, refining, and disseminating information and knowledge. Knowledge is often embedded in an organization in the form of experiences or memory. This embedded knowledge has traditionally been known as organizational memory.

Recent developments in information processing technologies have enhanced our abilities for building knowledge management systems. Knowledge is determined through searching, filtering, cataloging, and linking of information collected from a variety of sources and media. Information is refined in multiple ways and disseminated to recipients as reports, analyses, etc.

A knowledge management system must systematically deal with the creation, integration, maintenance, and dissemination and use of all kinds of knowledge within an organization. We have developed a committee-based model comprising several components to manage this process. We see such a model as defining a portal from the organization to its knowledge. The strength of an enterprise information portal lies in its ability to organize disparate information in a seamless fashion. Specifically, the model automates identification and distribution of relevant content, provides content sensitivity, interacts intelligently with users letting them profile, filter, and categorize, and avails of the complex information infrastructure. Central to the system is the user, often a decision-maker or a decision making body of people (as in the case of a committee or group). The components of the model are (1) a recorder subsystem, (2) a composer and builder subsystem, (3) a knowledge navigator and retriever subsystem, and (4) a knowledge percolator subsystem. The model operates on the organizational memory of the organization. While many vendors sell products meeting one or more of the features described above, the lack of ability to apply many of these and other related technologies to complex knowledge such as that contained in prior decisions (including the decision making process) and other forms of organizational knowledge is a problem. In this paper we present the model and briefly look at the prototypes used to evaluate the feasibility of our knowledge management model.

In the next section we briefly look at the issues of developing and using organizational memory. In Section 3 we define and describe our committee-based model. Section 4 looks at the current status of our prototypes for testing the feasibility of the model. Section 5 concludes the paper.

ORGANIZATIONAL MEMORY

Organizational memory has been described to refer to corporate knowledge that represents prior experiences and is saved and shared by users. It may be used to support decision making in multiple task and multiple user environments. The concept encompasses technical, functional, and social aspects of the work, the worker, and the workplace [Durstewitz 1994]. Organizational memory includes stored records (e.g., corporate manuals, databases, filing systems, etc.) [Ackerman 1996] and tacit knowledge (e.g., experience, intuition, beliefs) [Nonaka and Takeuchi 1995]. Walsh and Ungson [Walsh and Ungson 1991] refer to organizational memory as stored information from an organization's history that can be brought to bear on present decisions. By their definition, organizational memory provides information that reduces transaction costs, contributes to effective and efficient decision-making, and is a basis for power within organizations. Researchers and practitioners recognize organizational memory as an important factor in the success of an organization's operations and its responsiveness to the changes and challenges of its environment (e.g., [Angus et. al 1998; Bright et. al 1992; Huber 1991; Huber et. al 1998; Stein 1995; Stein and Zwass 1995]).

Information technologies (IT) contribute to the possibility of automated organizational knowledge management systems in two ways, either by making recorded knowledge retrievable or by making individuals with knowledge accessible [Ackerman 1996]. An organization's knowledge, explicitly dispersed through a variety of retention facilities (e.g., network servers, distributed databases, intranets, etc.) can make the knowledge more accessible to its members. Stein and Zwass [1995] suggest that an extensive record of processes ("through what sequence of events?"), rationale ("why?"), context ("under what circumstances?"), and outcomes ("how well did it work?") can be maintained with the help of IT. The availability of advanced information technologies increases the communicating and decision making options for potential users.

An organizational memory supported by information technology provides several advantages The contents that are stored in information systems are explicit, can be modified promptly, shared as necessary, and changes can be propagated quickly and easily. Information systems should be however be designed to augment the interaction between knowledge seekers and information providers as it would lead to higher levels of organizational effectiveness and learning [Huber et. al 1998]. Technological changes and shifting demands make rapid learning essential in organizations. The advent and increasingly wide utilization of wide area network tools such as the Internet and World Wide Web provide access to greater and richer sources of information. Local area networks and intranets give organizations a way to store and access organization specific memory and knowledge. Used effectively, these tools support the notion of organizational memory.

Sandoe et. al [1998] use Giddens' definition [1984] of organizational memory to distinguish among three types of memory, namely discursive, practical and reflexive. Discursive memory is a collection of stories, anecdotes, reports, and other public accounts. Practical memory is the unarticulated know-how—the skills and practices that comprise the bulk of routine interactivity. Memory that is automatically invoked in organizations without any requirements for conscious thought or discussion such as organizational norms is considered reflexive. Sandoe et al. [1998] argues that there is a continuum of characteristics that stretches between discursive memory on one end and reflexive memory on the other. Discursive memories are oriented to be flexible while reflexive memories are focused on yielding efficient memory use. Organizations have to balance the need for flexibility against the need for efficiency.

Sandoe et al. [1998] treat IT based organizational memory as discursive. They argue that although IT-based memory operates at a discursive level, IT makes the discursive process of remembering more efficient by reducing the costs and effort associated with storage of and access to an organization's memory. IT changes the balancing point in the trade-off between efficiency and flexibility, permitting organizations to be relatively more efficient for a given level of flexibility. Another advantage of IT-based memory is the opportunity to provide a historical narrative (or rationale) for significant organizational events that would otherwise be remembered in non-discursive form. Reliance on IT-based memory, on the other hand, allows an organization to act in a rational manner through the discursive access to its major historical events and transformations.

Organizational Memory Systems (OMS)

Mandiwalla et al. [1998] define an organizational memory system (OMS) to include a DBMS, a database that can represent more than transactional data, and an application than runs on top of the DBMS. They further describe the generic requirements of an OMS to include different types of memory, including how to represent, capture, and use organizational memory. The data shown below lists these requirements.

OMS Design Issues

Designing the ideal OMS is a difficult task, especially as definitions, technologies, and usage contexts continue to shift and evolve. Mandiwalla et al. [1998] identified some of the barriers and issues facing designers.

- Focus: Reconciling group,. inter, and intra organizational perspectives of OM.
- Quantity: Balancing comprehensiveness with storage constraints. Incorporating video data quickly tilts the balance away from comprehensiveness. Increasing comprehensiveness also increases the potential for information overload.
- Filters: If you cannot store everything then who decides what to store? What is the mechanism and criteria? How do you avoid bias?
- Role of individual memories: Where do individually held memories fit in? Are they redundant? How can they be used? What are the legal and social implications?
- Storage: OM typically implies some type of storage. Information storage will in the foreseeable future always involve costs such as the actual storage medium, the time needed to access the selected medium, and the administrative cost of maintaining the information. Organizations will need tools that that will help them evaluate the cost benefit of storing memory. For example, 1 second of video (30 frames) needs about 27K of space. This means that about 3 hours of video could be stored on a 10-Gigabyte medium. It is unlikely that storage costs will decrease sufficiently in the near term for this to be a non-issue.
- Retrieval: Widely held assumptions about data imply that the more OM we store the harder it becomes to locate a specific memory item of interest. Therefore, OM conceptual models will need a built in filtering mechanism.

Types of memory	Meta data Structured data (records) Semistructured data (documents) Unstructured data (audio/video) Temporal data
Types of representation	Structure and internal organization of data the representation of data in the user interface
Capture schemes	Transparent versus assisted Hidden versus open
Use	Time and Space considerations Activity driven Coordination needs Boundaries including security

- Integration/Re-integration: If information about the same topic is stored in multiple formats—say in database and multimedia format, users will need to tools to re-integrate or "re-understand" and synchronize the memory.

In the next section we look at a knowledge management system that uses the concepts from organizational memory and applies them to the committee level.

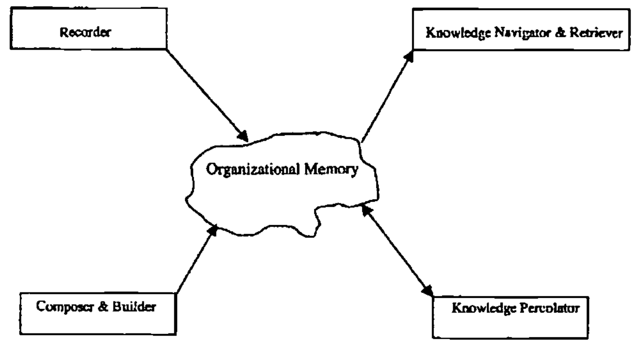
COMMITTEE-BASED KNOWLEDGE MANAGEMENT MODEL

A knowledge management system must systematically deal with the creation, integration, maintenance, and dissemination and use of all kinds of knowledge within an organization. We have developed a committee-based knowledge management model comprised of several components to manage this process. The strength of our committee-based model lies in its ability to organize disparate information in a seamless fashion. Specifically, the model automates identification and distribution of relevant content, provides content sensitivity, interacts intelligently with users letting them profile, filter, and categorize the complex information infrastructure. Central to the system is the user, often a decision-maker or a decision making body of people (as in the case of a committee or group). The components of the committee-based model are (1) a recorder subsystem, (2) a composer and builder subsystem, (3) a knowledge navigator and retriever subsystem, and (4) a knowledge percolator subsystem. A block diagram of the relationship between organizational memory and the components of the model is shown in Figure 1. The data comprising the organizational memory provides the basis of any knowledge extraction. In the remainder of this section we examine the main components of the model.

Recorder

Organizational processes such as meetings, sequences of tasks, operating procedures and policies, etc., are potential sources of knowledge. Recording or capturing a knowledge production process is the first step towards making knowledge available for future use. Capturing the decision making process, as in the case of capturing a focus group meeting, allows for further analysis of the process. Similarly, recordings of events in a process environment (e.g., software development or system maintenance) can be used to maintain examples of best practices.

FIGURE 1
RELATIONSHIP BETWEEN COMPONENTS AND ORGANIZATIONAL MEMORY



A recorder is a tool for capturing the knowledge generation process. Since our model is committee based, we see the recorder as capturing committee meetings. There are numerous formats for the recorder. As support software improves (e.g., dictation software), the range of possibilities will continue to expand. In today's environment the possibilities depend on the media used to conduct the meeting. If the media is the Internet or conferencing software, then a record of the meeting can be obtained by storing the electronic form of the transmissions. For traditional meetings, it is possible to record the entire committee meeting using meeting capture software [Miller and Nilakanta 1997]. You can capture the complete meeting script, including sound, images, and documents that are part of the meeting (decision making) context. Once the recording is complete, the data is prepared for playback. Preparation includes eliminating errors, replacing missing data, synchronizing the sound with the flow of events, and adding security tags. A recorder is a valuable complement to any collaborative tasks.

Composer and Builder

Organizational knowledge ranges from structured data (as provided by on-line transaction processing systems-OLTP) to unstructured data such as user comments, email messages, reports, images, etc. The majority of the structured knowledge in an organization resides in its data warehouses and production databases. Proponents of decision support technologies have focused on not only retrieving information from vast databases, but also in identifying relationships among the different information sets. Only recently has this vision started to take shape. Data warehouses and data mining are fast becoming the knowledge sirens of the nineties.

Designing and building a data warehouse has been an expensive and error prone process. It does not have to be that way. Today, the designer must have intimate knowledge of the database schema to generate a valid data warehouse. With rapid turnover of technical professionals, organizations have difficulty in satisfying this goal today. While more complete meta-data (information about the data) could help, a lack of industry standards is also a major hurdle. The fact that commercial warehouses are value based (record-oriented) and much of the most valuable organizational data is unstructured also limits the value of today's warehouses in the knowledge management process. Object-oriented data warehouses [Miller et. al 1997, 1998] will help bridge this gap, but much work still needs to be done.

Another large amount of data (especially things like reports, email and web pages) may not belong in the data warehouse environment. Supporting these data types requires additional design criteria beyond the development of a module to create data warehouse designs.

Warehouse composer. Research in the database domain has developed several models and algorithms that are useful for designing data warehouses with little intervention of a data warehouse expert required. The warehouse composer uses meta-data to guide the designer to construct any desired warehouse table. The data warehouse composer is responsible for advising the user if a feasible warehouse solution is possible, warning if none exists. The issue is to test the queries required to generate the warehouse table for the lossless join property. Failure to test for the lossless join property could result in creating warehouse tables with erroneous data relationships. Warehouse sources can be single databases or multiple, heterogeneous data sources (relational DBMS like Oracle, SQL Server, flat file systems like VSAM, or any other type of legacy system). When the data sources are many and varied, the warehouse modeler must be able to integrate the semantics of the data sources and bridge the distributed nature of the environment.

Warehouse builder. The warehouse builder is a sub-component that automatically populates the composed data warehouse design. It must be able to automatically populate the warehouse with data extracted from multiple, distributed data sources once the warehouse composer has generated the design of the warehouse table.

Additional data sources. While the recorder is the source of much of the company's internal data, other data, such as email and additional reports, also need to be captured. External data (e.g., reports, web pages) are also part of any company's knowledge base and must be either collected or made accessible by users.

Knowledge Navigator and Retriever

Two subsystems are needed in our model to provide access to both forms of data. First, we need a knowledge navigator to allow users to navigate through the recorded committee meetings. Second, a retriever subsystem is necessary to retrieve information from the organizational memory that does not require navigating a committee meeting.

Knowledge navigator. Navigation through a corporation's knowledge base is a critical component of any knowledge management environment. In our committee-based approach it is necessary that the users be able to look at all or part of any meeting (depending on the security clearance of the user). The committee knowledge navigator is a playback subsystem allowing for selective replay of the meeting or other knowledge creation processes. Selections can be made on the basis of keywords, participants, or other parameters of choice. Unlike other screen-capture movies, the knowledge navigator must give the user increased flexibility in choosing portions of the process to view or learn. Moreover, it must be possible for key parts of the process to be isolated (based on rankings, keywords or security levels) and studied.

Knowledge retriever. As an organization builds its knowledge base using both structured and unstructured data, on line knowledge management systems capable of providing this knowledge to users is needed. Typically, some form of universal query environment that can work with any type of data is needed. These systems can be built around proven technologies such as relational and object database management systems, data warehouses, distributed objects (CORBA), and intelligent agents.

Retrieving information from standard data warehouses or transaction systems is a trivial process. But, when the information is complex (email messages, documents, etc.) and it is widely distributed (internal and external to the organization), simple retrieval schemes will generate millions of pieces of information. Not only is the sheer volume of information retrieved a problem, the relevancy of the retrieved information is also questionable. Unless the retrieval tool can filter out unwanted and irrelevant information and suggest a relevancy index the tool will be of little use.

To support the data that are not directly tied to an individual committee meeting, it is necessary to provide one or more interfaces that give the user access. Today it is very likely that multiple interfaces would be used e.g., an interface that gives access to an existing data warehouse or production database and an interface that gives the user access to textual data. In the future as multidatabase systems [Bright et. al 1992] mature a single interface to several heterogeneous data sources is likely to reduce the need for multiple user interfaces.

Knowledge Percolator

Benefits accrue to organizations when their members can learn from prior experiences. Learning from best practices and experiences requires that the user has easy access to relevant information, can ascertain causes and effects, and derive generalizations. Building a web of antecedents and consequences creates the collective memory of organization.

The knowledge percolator is a software suite that enables the percolation of "wisdom" from prior experiences. Several learning algorithms (e.g., genetic algorithms, pattern recognition, etc.) would be used depending on the task's context to glean the underlying decision process or workflow.

IMPLEMENTATION OF THE COMMITTEE-BASED MODEL

To test the feasibility of the model presented in the previous section, we implemented prototypes of the components of the model. A block diagram of a typical problem domain is shown in Figure 2. The remainder of this section briefly looks at some of the key features of our prototypes.

Recorder

To capture meetings, we have implemented acknowledge recorder designed to capture individual committee meetings [Miller and Nilakanta 1997]. The capture phase starts at the meeting. The sounds of the meeting are captured in a .wav file. In addition to the captured sound, the recorder generates a command file and captures any on-line images that have been presented at the meeting. A block diagram of the process is shown in Figure 3.

FIGURE 2
BLOCK DIAGRAM OF A TYPICAL PROBLEM DOMAIN

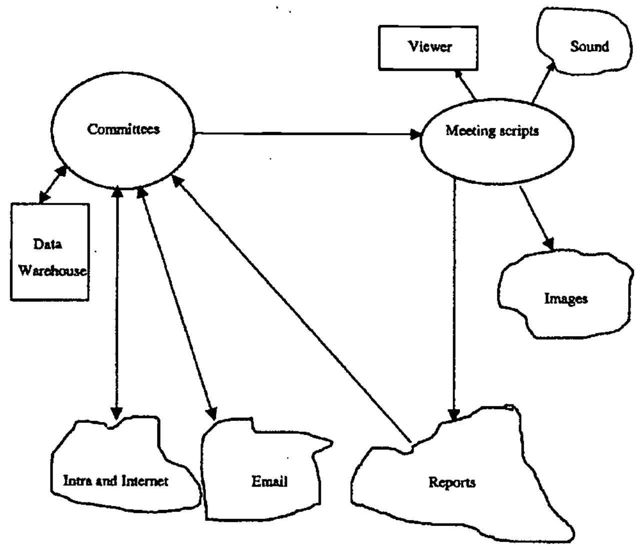
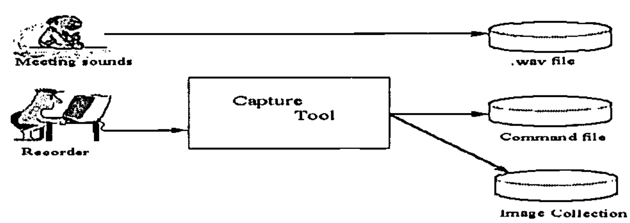


FIGURE 3
CAPTURE PHASE OF THE RECORDER



The capture tool is a Visual Basic program designed to make the task of capturing the semantics of the meeting a reasonable task. The tool is event driven and is based on the following set of fixed events.

Sound capture. Here the notion is that the recorder will need to capture events such as changes in speakers and/or changes in topic. The tool makes it easy for the recorder to capture information about who is presenting, relevant keywords, meeting time, and a relevancy index (rank). Initiation of this event assigns the current time stamp to the command file entry.

On-line image capture. The recorder can capture an on-line image by initiating this event. The image is

7

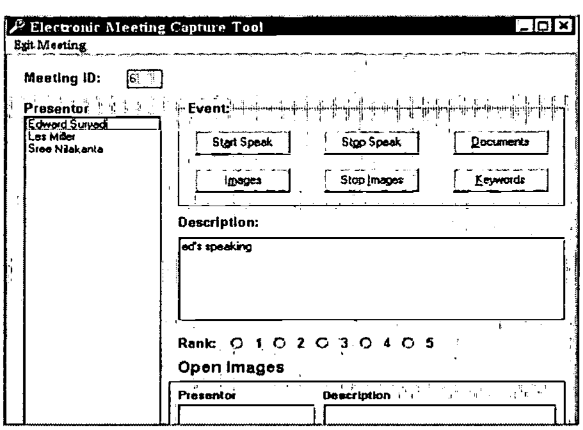
captured from the screen and placed in the image collection. In other words the image is placed in a file and the file name along with a system generated image id are placed in a file called the image file. The program also creates an entry for the command file consisting of the current time stamp and the image id. The recorder can supplement this information with the presenter of the image (who), meeting time (when), relevant keywords (what), and a relevancy index (rank).

Hardcopy capture. This event allows the recorder to capture the relevant information about any transparencies or charts used during the meeting. The information captured is similar to the on-line image capture with the obvious exception that the recorder will need to convert the hard copy images to an on-line format, along with the information on who, when, what, and why.

Document capture. This event is similar to the hardcopy image capture event except for the fact that the document will be viewable as a unit and the only entry in the command file will be made when the document is handed out.

Beyond the on-line image capture event (which both captures an image and creates an entry in the command file), the main function of the last two events is to create an entry in the command file. As each event is recorded, a timestamp is added. Additional comments, keywords and a rank, indicating relevancy of the content to the goal of the meeting are also added by the secretary. Each event has a start and end point. A sample screen is shown in Figure 4.

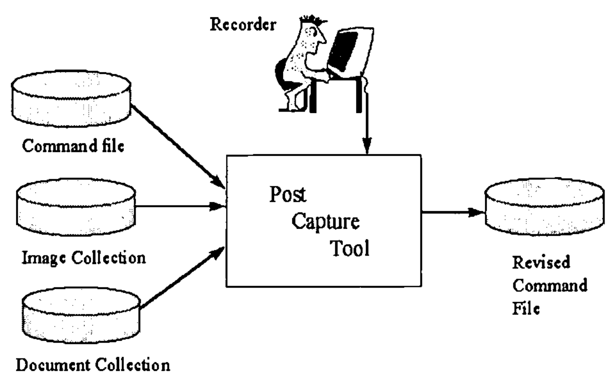
FIGURE 4
CURRENT CAPTURE TOOL SCREEN



At the end of the meeting, the meeting secretary (we used the term recorder for the meeting secretary in [Miller and Nilakanta 1997] and have maintained it here for consistency) converts the documents, transparencies and charts into an electronic format. The current approach used in our design is to scan anything that the participants can't provide in electronic form. Individual images and documents are added to the image and document collections, respectively. Note that the format of both collections is a file of pointers to the individually stored objects. The result is that at the end of the capture phase, a command file, an image collection and a document collection are ready for additional processing.

We have implemented a post capture tool to allow the secretary of the meeting to incorporate more relevancy information into the command file and to synchronize the command file with the sound file. The first aspect of the post capture phase is that the recorder uses a post capture tool to replay the meeting based on the captured semantics. During this phase, the recorder can correct obvious command entry errors and insert the post meeting rank values for the objects. Note that the correctable part of a command is the time stamp, the assigned participant(s), and the relevant keywords. The relevancy index (rank) assigned by the recorder during the meeting can not be changed. The security level of the command file entries are added during the post capture phase. A block diagram of this phase is shown in Figure 5.

FIGURE 5
ORGANIZATION OF POST CAPTURE TOOL IN CURRENT IMPLEMENTATION



The result is that a meeting script is created for each committee meeting. The meeting script can then be used by the knowledge navigator subsystem to allow users to revisit meetings through selected playback.

Knowledge Navigator

A prototype of a meeting viewer has been developed to take the data captured by the recorder subsystem and present the meeting via a web interface. The software transforms the command file produced by the recorder into a new command file based on the user's security clearance. All entries that violate his/her security clearance are removed. Once the new command file is created, the user can either view the restricted portion of the meeting in its entirety or search it for keywords and view the portion of it that is close to the location of the keyword in the command file (the meaning of close is specified by the user in minutes). The prototype plays the sound of the meeting, places and removes images from the screen depending on their start/stop time, and makes documents available to the user at the point in the meeting that they were handed out. The user can replay portions of the meeting script.

Composer and Builder

Two prototypes have been designed and implemented to this point for designing and building data warehouse tables. The first prototype provides a click and point interface that the user can use to choose the format of a warehouse table from the meta-data for a set of source relational databases. Once the user has chosen the desired data warehouse attributes, the prototype uses a query generator that generates a lossless query over the relational databases or returns a message that no lossless query is possible. If the data warehouse attributes span more than one database, the query can be partitioned to create a set of queries that can then be used to obtain the required data to populate the data warehouse table. The lossless test has been designed to make use of the table names, attribute names and functional dependencies (if they are available) from the production database meta-data.

A second prototype has been developed to build the warehouse table from the query generated by the previous prototype. In this new prototype once a query is generated, the query is partitioned and a set of mobile software agents are generated to go to the data source locations, generate the required data, and return it to the interface for storage in the data warehouse. The data is automatically added to the new warehouse table when the agent returns to the prototype's interface. To this point, the prototype supports both relational databases and batch based legacy systems.

Knowledge Retriever

Our prototype for the knowledge retriever fetches information using an intelligent search process. Knowledge retriever is based on well-grounded research in the area of information retrieval. Our prototypes use the vector space model. In addition to comparing queries and documents, we make use of user or committee profiles in our prototypes. A profile is a list of possibly weighted terms provided by a user, which reflects the users or committee's long-term interests. Initially, a profile can be created manually or based on a set of relevant documents. Documents, queries and profiles all are represented by term vectors at retrieval time. The full system consists of three parts: indexing the documents, weight assignment and retrieval or filtering.

During the retrieval phase each query, document and committee profile is represented by a list of weighted terms to reflect the relative importance of terms. The weight of term *tj* in document *di* is defined by $wt(i,j) = tf(i,j) * log(N/df(j))$, where N is the total number of documents in a collection and $tf(i,j)$ and $df(j)$ are term and document frequencies as defined above.

The similarity between a document and a query or a profile is represented by the mathematical properties of the vectors. For a document D and a user query or a profile Q, let DD = char(D), QQ = char(Q), then the similarity between d and q is defined by

$$SIM(D, Q) = cos(AngleOf(DD, QQ)) = \frac{DD \cdot QQ}{||DD|| * ||QQ||}$$

where

$DD \cdot QQ = \Sigma DD[i] * QQ[i];$
$||DD|| = sqrt(\Sigma DD[i] * DD[i])$ *and*
$||QQ|| = sqrt(\Sigma QQ[i] * QQ[i])$ are the norms of vectors *DD* and *QQ*, respectively.

All the documents are ranked by this similarity coefficient. Documents whose similarity coefficients exceed a predetermined threshold are retrieved.

A relevance feedback mechanism has been provided to modify the original query or profile to achieve better retrieval performance. Based on the feedback from users, term weights in the committee profile are changed to reflect the committee's actual interests.

The current prototype has been implemented using mobile software agents to connect the user interface with the document collections. An earlier version of the prototype [Hu et. al 1998] used a more typical interface to a file of documents to support the knowledge management process.

Knowledge Percolator

There are numerous opportunities in an organization to generate knowledge. Since our approach is committee-based, we have focused to this point on analyzing committee decisions. Our current prototype is only the first step in developing this aspect of the model. The obvious choice to start analyzing the committee decision process is to look at the information in the data generated by the committee meeting.

In our current prototype we made use of a neural network to model the decision process of committees. The command file generated by the recorder contains the necessary information, but can not be used directly. It requires transformation into a format that can be used by the neural network. To aid in the transformation process, the prototype incorporates a set of transformations based on sliding a window over the records in the command file.

The command file entries are used by the transformation to generate the specified statistics for each member of the committee. The prototype assumes that the committee membership consists of the union of the attendees of the set of meetings that are being processed. The **decision-variable** is set to *true* if a decision has been reached in the command file records covered by the window and is set to *false* if no decision has been reached.

The focus of the current software is to look for activity patterns in the meeting that result in decisions. The transformed file is used to construct a neural network. The **decision-variable** serves as the classifier in the training set for the neural network construction. Once the prototype has build the neural network, the neural network can be used to generate a set of rules for the decision making process within the committee. The motivation behind this approach is to develop a methodology for setting up committee meetings to optimize the decision process.

CONCLUSIONS

A model of a knowledge management environment has been given. The model takes a committee-based approach and uses committee meetings as the primary data collection point. The assumption is that more traditional forms of data (databases, data warehouses, and report libraries) are easy to generate and the major concern is to incorporate them in with the knowledge management process. Existing prototypes for the components of the model have been briefly overviewed to address the feasibility of the model.

REFERENCES

Ackerman, M. S. (1996). "Organizational Memory," http://www.ics.uci.edu/~ackerman/ om.html. 1996.

Angus, Jeff, Jeetu Patel and Jennifer Harty. (1998), "Knowledge Management: Great Concept ... But What Is It?" *InformationWeek*, March 16, 58-70.

Bright, M. W., A. R. Hurson and S. H. Pakzad. (1992). "A Taxonomy and Current Issues in Multidatabase Systems." *IEEE Computer*, Vol. 25, No. 3, pages 50-60.

Dustewitz, M. (1994). "Newsletter on Corporate Memory, Report from the Toulouse Workshop," November 3-4, *Eurisco*.1994.

Giddens, A. (1984). The Constitution of Society: An Introduction to the Theory of Structuration." Berkeley, CA: University of California Press, 1984.

Huber, G. (1991). "Organizational Learning: The Contributing Processes and Literature," *Organization Science*, 2, 88-115. 1991.

Huber, George, Thomas H. Davenport, and David R. King. (1998). "Perspectives on Organizational Memory," Presentation at the *31st Annual Hawaii International Conference on System Sciences Task Force on Organizational Memory*.

Mandviwalla, Munir, Stefan Eulgem, Carol Mould, Srinivasan V. Rao. (1998). "Organizational Memory System Design," presentation at the *Thirty-First Annual Hawaii International Conference on System Sciences Task Force on Organizational Memory*.

Miller, L. L., Vasant Honavar and Tom Barta. (1997). "Warehousing Structured and Unstructured Data for Data Mining." *ASIS'97*. 215-224.

Miller, L. L., V. Honavar, J. Wong, and S. Nilakanta. (1998). "Object-Oriented Data Warehouse for Information Fusion from Heterogeneous Distributed Data and Knowledge Sources." *IEEE Information Technology Conference*, 27-31.

Miller, L. L., and Nilakanta, S. (1997). "Tools for Organizational Decision Support: The Design and Development of an Organizational Memory System," *Proceedings of the 30th Annual Hawaii International Conference on System Sciences*, 360-368.

Nonaka, I. and Takeuchi, H. (1995). *The Knowledge-Creating Company,* Oxford University Press.

Nonaka, I., and Takeuchi, H. (1995). *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*. New York: Oxford University Press.

Sandoe, Kent, David T. Croasdell, Jim Courtney, David Paradice, JoAnn Brooks, and Lorne Olfman. (1998). "Additional Perspectives on Organizational Memory," Presentation at the *31st Annual Hawaii International Conference on System Sciences Task Force on Organizational Memory.*

Stein, E. W. (1995). "Organizational Memory: Review of Concepts and Recommendations for Management." *International Journal of Information Management*, 15(2), 17-32.

Stein, E. W., Zwass, V. (1995). "Actualizing Organizational Memory with Information Systems," *Information Systems Research*, Vol. 6 No. 2, 185-217.

Walsh, J. P. and Ungson, G. R. (1991). "Organizational Memory," *Academy of Management Review*, Vol. 16, No. 1, 57-91.

Wen Hu, L. L. Miller and Sree Nilakanta. (1998). "PROMIS: A Profiler of Organizational Memory and Institutional systems." *The 9th International Conference of the Information Resources Management Association.*

NOTICE

Reproduction Basis

- [X] This document is covered by a signed "Reproduction Release (Blanket)" form (on file within the ERIC system), encompassing all or classes of documents from its source organization and, therefore, does not require a "Specific Document" Release form.

- [ ] This document is Federally-funded, or carries its own permission to reproduce, or is otherwise in the public domain and, therefore, may be reproduced by ERIC without a signed Reproduction Release form (either "Specific Document" or "Blanket").