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Primary Research Area

An emerging area of information technology today is the organizational information sharing network. Examples include Lotus Notes, distributed cooperative work systems, and Intranets. These applications often contain information generated from both inside and outside the organization. Information Systems (IS) organizations are betting that easier, more timely access to digital documents (DDs) of all types will improve the performance of knowledge workers and lead to competitive advantage (Huber, 1990).

Helping end users gain access to corporate information resources has long been a concern of IS practitioners and researchers. Today, the range of information created and available to be used inside corporations is very broad and includes complex information products such as text documents, image files, multimedia reports, and electronic maps. This dissertation will explore knowledge workers' judgments about complex electronic information products in an organization within a supporting IS infrastructure. The questions that stimulate this research are:
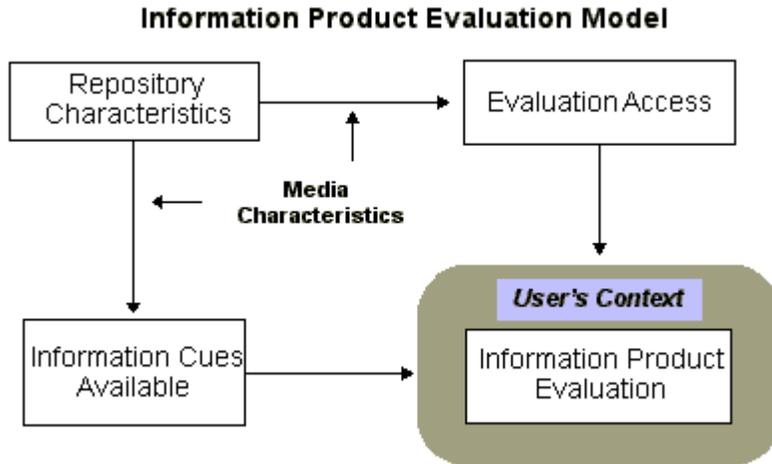
- How can IS support end user identification of and access to DDs?
- How can IS support the creation of DDs that are easier for users to identify, evaluate, and use?
- What factors affect users' evaluations of DDs in an organizational context?

Information Product Evaluation

A model, called the Information Product Evaluation (IPE) model, has been developed provide direction for research on these questions. (Major propositions of this model are presented in Murphy, 1996.)

DDs are considered irreducible units with the entire unit the subject of the search function. Complex electronic DDs require different types of tools to facilitate access and different strategies to support their use (e.g., Loeb, 1992).

It is proposed that users evaluating information created by another (potentially unknown or unfamiliar) party may be usefully conceived of as a discontinuous or interrupted communication. This suggests that knowledge workers would use approaches for DD evaluation that are similar to those effective in the interpretation of messages. Communication research has identified context as important for accurate interpretation of communication messages (Haslett, 1987).

Information Product Evaluation Model

Repository Characteristics → Evaluation Access

Media Characteristics

Repository Characteristics ← → Media Characteristics

Information Cues Available →

User's Context

Information Product Evaluation

As a result of the propensity to preserve cognitive effort (e.g., Schwenk, 1984), and in recognition that users rely on cues for other electronic-based communication modes (e.g., Sproull and Kiesler, 1986), it is proposed that the availability of cues about both content and context will be a significant factor in effective and efficient DD evaluation. For example, Loeb (1992) found that useful meta-information for retrieval of electronic music files included characterizations of the intended users, characterizations of the source, and item creation time (all indicators of context).

Problems for knowledge workers accessing and using DDs may arise from -- among other sources -- the task's structure (or lack of it), user's lack of skill or knowledge, barriers to the use of a particular repository, or attributes of the repository itself.

Relevant Theories and Research

Four streams of research have been used to develop the IPE Model. They are: Information Search and Retrieval (ISR), Communication Theory, Media Choice/Richness (MCR), and Accessibility.

Information Search and Retrieval

Information Search and Retrieval (e.g., Belkin and Croft, 1992) provides a starting point for this research since it offers a process model for the user to obtain descriptors of the DDs without necessarily having access to the actual documents. User evaluations commence when at least one DD is retrieved (the focus of this research).

ISR has some limitations that affect its application to DD use by knowledge workers in organizations, including:

- assumptions about the role of task (e.g., task may not be one of uncertainty, but rather one of equivocality);
- a lack of recognition of organizational factors (e.g., motivation of organization for the information need);
- the presumed existence of a collection (e.g., creators make independent decisions about adding or removing DDs from the shared resource).

Communication Theory

Shannon and Weaver's (1964) work on information transmission has been used by communication scholars (e.g., Haslett, 1987) to create a basic communication model composed of message, transmission medium, sender, receiver, encoding, decoding, and feedback. This basic communication model presumes that senders and receivers cooperate to create the communication (or information). [Haslett, 1987] However, there are forms of communication in which the sender and receivers do not require or are not in direct contact. The information produced is the outcome of an asynchronous communication act. For complex DDs, the document created by the sender is encoded and placed in a repository for later consumption by a (possibly unknown) receiver.

The situation in which synchronous communication occurs is called its context (Haslett, 1987). In asynchronous communication, the context is not jointly created during the communication, so more than one context can be defined: the context of creation (the sender's) and the context of use (the receiver's). An understanding of context is necessary for accurate communication since its lack can produce noise or miscommunication. This suggests that access to information about the context of the sender (DD creator) would facilitate higher quality evaluations by the receiver (DD user).

Media Choice/Richness

There is a long stream of research in IS related to the choice, use, and effectiveness of electronic communication media (e.g., Sproull and Kielser, 1986; Zmud, Lind and Young, 1990). MCR suggests that the type of media used for an DD would affect the cues available to assist in its interpretation and its perceived accessibility. For example, Zmud et al. identified channel accessibility as a factor in the choices of media for communication acts. Sproull and Kiesler found that non-content cues were important in effective electronic communication.

MCR research suggests that media characteristics will be operating through IS infrastructure decisions about the repository, the infrastructure, and the document interaction environments of both the creator and user.

Accessibility

Accessibility includes both physical access to the source and difficulty in acquiring information once physical access has been achieved (Culnan, 1985). Access cost or effort can vary by capabilities of the user, factors in her environment, or attributes of the DD itself. These evaluative costs may be both real (e.g., connect time charges) and perceived (e.g., worry about learning a new interface).

O'Reilly (1982) measured accessibility as an DD attribute that was perceptual in nature. Hart and Rice (1991) report that how external on-line information systems are accessed can moderate the relationships among "requiring information, using it, and evaluating its benefits" (p. 462). Culnan (1985) found that "perceptions of accessibility are moderated by prior experience with the source and contextual factors" (p. 302).

During an evaluation of a retrieved DD reference, it is proposed that accessibility be considered both ease of access to meta-information and ease of access to the entire DD. The user must assess the probability that investing additional time and effort to obtain the full document will be compensated by the value of its use. This distinction serves to separate issues of access to the information product from the role of accessibility in the evaluation decision.

Methodology

Looking at the IPE Model, we can identify research needs at both organizational and individual levels. Some of these factors are directly related to IS management decisions while others related to individual differences and task and organizational situation variables.

At the organizational level, a wide range of IS decisions and organizational factors could affect users' DD evaluation outcomes. IS architecture and infrastructure decisions have a direct bearing on the telecommunication capabilities for both DD creators and users. End user platform and software decisions influence the types of DDs created and the supporting mechanisms such as meta-data and search and retrieval interfaces. Policies about data management have the potential either to promote or discourage DD re-use. An additional area of IS involvement is in training and support of end users, for example, whether meta-data creation and search capabilities are taught in end user application classes.

At the individual level, factors that affect evaluation outcomes have been identified related to user attributes, tasks, and the organizational context. For example, at the user level, motivation, communication competency, and experience with the task are expected to act upon the processing involved in the evaluation. The information need -- predominantly determined by task -- can vary widely and will affect the types of information sought as well as the methods for its evaluation.

Because internal information sharing networks are a relatively new implementation of IT, exploratory field work will investigate two elements -- the nature of repositories and the significance of access to works-in-progress. Compared to another form of information sharing systems, the digital library, DD repositories in organizations are unlikely to have a custodian (i.e., collections librarian) or other agent to supervise the addition and deletion of content and meta-data. Furthermore, inside organizations, DD repositories are expected to contain a higher proportion of works-in-progress and unfinished documents. In particular, for knowledge- and information-dominated organizations, works-in-progress may be of special interest since early access to content may promote organizational responsiveness (Huber, 1990). Field interviews among early adopter organizations are proposed to explore the importance of these two elements.

Additional research is contemplated to test the key assertion of the model that DD evaluation can be modeled as asynchronous communication. An experimental study will evaluate the role of cues in the DD evaluation decision at the individual level. While the design is not final, an example of the type of study contemplated would control for task, organizational context, and user variables and manipulate the amount of cues related to content, context, and accessibility.

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