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Exploring the Relationships Between Memory, Knowledge, and Effectiveness

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Introduction

Jennex (1997) identified a correlation between improved organizational effectiveness and an improved Organizational Memory System (OMS). Jennex, et. al. (1998) proposed modifications to DeLone and McLean’s IS Success Model with respect to evaluating an OMS. In particular it identified the form and type of the OMS as crucial to evaluating the system quality factor for determining IS success. This study originally intended to explore OMS effectiveness with respect to new members and to the use of knowledge management (KM) for getting information into the OMS. In the process evidence was found suggesting a relationship between KM, organizational memory (OM), and organizational effectiveness; and a further expansion to DeLone and McLean’s IS Success Model. Ultimately, these findings do not support the conclusion that a OMS that relies more on the computer based form of OM will be a more effective OMS. The relationships between KM, OM, and OMS effectiveness; and the factor of information quality in DeLone and McLean’s IS Success model are used to explain this finding. The findings suggest that what ultimately affects the effectiveness of OM is the linkages to knowledge that are kept in the OMS.

Previous Research

Jennex (1997) explored the relationship between OM and engineer productivity through the proposition that information systems (IS) for engineers are more likely to improve productivity if they integrate OM support functions into the organizational IS. As expected, support was found for this proposition.

Jennex et. al. (1998) suggests that OMS success could be related to OMS effectiveness and proposed a modification of DeLone and McLean’s IS Success Model that expands the system quality component to include OMS form and type considerations and the use factor to include the Perceived Benefit model as a way of predicting continued use of a OMS.

Huber (1991) considers four constructs as integrally linked to organizational learning: knowledge acquisition, information distribution, information interpretation, and OM. He states that learning need not be conscious or intentional and does not always increase the learner's effectiveness or potential effectiveness. Learning need not result in observable changes in behavior. Taking a behavioral perspective, Huber (1991) notes: An entity learns if, through its processing of information, the range of its potential behaviors is changed.

OM has various definitions. Some view it as abstract, supported by concrete/physical memory aids such as databases. Others as concrete, including computerized records and files. Jennex (1997) found a combination of abstract and concrete where the concrete is the history and trend data collected in the OM and the abstract was the experience gained by the user over time.

Prusak and Davenport (1998) define knowledge as a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. It often becomes embedded in documents, repositories, routines, processes, practices, and norms. The Knowledge Management Systems (KMS) is the system used to manage knowledge.

Comparing OM and knowledge suggests that OM includes and emphasizes the acquisition of knowledge. It is concluded that OM acquisition, retrieval, and use is synonymous to knowledge acquisition, retrieval, and use. This is a basic assumption in the study and was found to be correct. The second assumption is that there is a relationship between KM and OM which was also found to be correct.

Methodology

This study used the same organization as Jennex (1997). Changes in the organization resulted in twenty-four new members and thirteen other members who changed duties for an approximate forty percent change rate. The goals of the study were:

- Validation of the OMS structure.
- Determining drivers for OMS knowledge acquisition.
- Collect newcomer perceptions on OMS effectiveness.

OMS structure validation used a survey distributed to all engineers asking for their concurrence with the stated OMS on a five point Likert scale. Additions and deletions were solicited to complete the description of the main components of the knowledge base. The collected data was an inadequate sample for statistical analysis. The responses were averaged and a overall score generated. Suggestions for additions and deletions were rated based on the number of appearances on responses.
A survey was generated asking if KM drivers were used or unused. The driver list was generated from observation and document review. Respondents rated used drivers with respect to importance, frequency of use, and formality. Responses were averaged.

Interviews collected opinions of newcomers. Ten interview subjects were chosen based on them not being in the group at the time of the original study.

Findings

OMS Validation

Twenty-one responses were received from the OMS validation survey for a response rate of 21.4%. Twenty agreed or strongly agreed with the OMS as stated. The one disagree listed no deletions and only a minor addition. The ten interviewees were also asked their concurrence with the stated OMS, all agreed or strongly agreed. The finding was that the OMS has not changed.

Effectiveness

Jennex (1997) found an effective OMS. Most all past decision information was retrievable within minutes to a couple of hours. Also, nearly all agreed that the OMS could be better. The subject organization had a very stable work force with many years experience. This study came after a voluntary retirement program was completed. Nearly all the interviewees, i.e. newcomers, agreed that the computer based portions of the OMS contained the appropriate information and was accurate. They also agreed that it was not effective due to poor linkages with personnel and other knowledge. This implies that the IS Success model Information Quality component should be expanded to include richness of the information in terms of accuracy, completeness, clarity, timeliness, and any other term that improves the ability of the information to convey the necessary meaning; and the detail of linkages and associations between information, knowledge, and sources. Figure 1 presents the final IS Success Model as modified by this study.

Knowledge Management

This study explored the KMS of the organization. It looked for formal and informal KM processes as described by Davenport and Prusak (1998). The first step was to do a document and process review to determine what KM processes existed within the artifacts of the organization. This list was then mixed with drivers that would be personal and informal. The resulting list of mixed drivers was evaluated for use, importance, and formality. The results show that there are a variety of drivers used by the subjects. The majority recognized the formal drivers from regulatory agencies and process requirements. They also indicated that their own insight and that of respected others were the primary informal drivers. The findings show a combination of formal and informal drivers as expected by Davenport and Prusak (1998). The presence of formal drivers implies that the organization has a formal KMS with formal KM processes.

KM, OM, and Organizational Effectiveness

Jennex (1997) found a relationship between OM and organizational effectiveness. This study investigated how information got into the OM. A number of formal and informal drivers used to get information and knowledge into the OM were found. These drivers are the KMS for the organization. The KMS is not static. It is adjusted over time by the impact the use of the OM information and knowledge has on the organization’s performance. This was determined by a review of the procedures used to control the formal KM drivers. These procedures have a history of revisions that show adaptation to changing requirements and performance. Jennex (1997) documented the organization’s performance over time and looked at the evolution of the OMS. The KMS shows a similar evolution. In summary, organizational learning affects organizational effectiveness. OM and KM affect organizational learning. OM reflects the IS role of providing a knowledge base and infrastructure. KM reflects the line organizations role of identifying critical knowledge. The impact on organizational effectiveness results in feedback to KMS. These relationships are shown in model form in figure 2. This is the ultimate finding of this paper.

Conclusions

There is a relationship between OM, KM, and organizational effectiveness as shown in Figure 2. Also, the quality of knowledge retained in the KMS/OMS impacts the effectiveness of the KMS/OMS with respect to new members and has some impact on long term members.

References


Figure 1 The KM-OM Modified IS Success Model

Impact to Organizational Effectiveness

Access and Use Memory to perform actions that affect Organizational Performance

Evaluate Events for Use of Applicable Memory to perform actions that affect Organizational Performance

Monitor Organizational Effectiveness and Adjust Knowledge Requirements as needed

Figure 2 The KMS-OMS Model

Identify and Acquire Knowledge for future use

Store, Retrieve, and Search Memory Base

Drives Users to put Information and Knowledge into their OMS