Transactive Memory Systems

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INTRODUCTION

A common problem that affects organizations nowadays is that many times the non-desired turnover of members that gather important organizational knowledge implies financial loss for the organization. New employees must be trained, or a recruiting process must start, which in both cases means a significant investment.

A solution to this problem was proposed in 1987 when the psychologist David Wegner defined the Transactive Memory concept. After some studies, Wegner concluded that when two people learn together, they learn more quickly. More knowledge is retained when it is interchanged. This learning process is called Transactive Memory. Based on these findings, along the years different platforms, which aim to simulate this knowledge interchange, preventing irreversible loss of knowledge within a group, have emerged. Examples of these platforms are *e-Learning* and Learning Management Systems, but none of them cover Daniel Wegner's theories completely or provide a solution that supports the simulation of the transactive memory concept.

BACKGROUND

Transactive memory details the relationship between the individual memory and communication systems. It refers to the fact that people in a continuous cycle of interpersonal relations frequently develop a specialized set of tasks: codify, store, recover information from different domains. Each member becomes a specialist in one area but not in the rest, and the members expect each one to be able to process and access the information in different domains. This specialization reduces the cognitive individual load, while it provides the group access to a large amount of information. Also this specialization reduces the effort wasted as a result of the superposition of individual knowledge. The way in which the information is distributed within the relation is part of the Transactive Memory System (TMS).

In organizations, a TMS has two goals:

1. Connect the groups to create open and permanent communication flows
2. Be able to replace a member of the group when he/she retires

In spite of the efforts made to implement the Transactive Memory concept, none of the solutions implemented supports Wegner's proposal and simulates completely a Transactive Memory.

The goal of this work is to analyse how well existing knowledge management systems implement the transactive memory system concept, and identify the deficiencies in existing solutions and how they could be overcome.

The remainder of this article is structured as follows; first the main concepts and implications regarding the concept of *transactive memory* and *transactive memory systems* are discussed; next, a discussion about the current support for deploying a TMS is presented; finally, conclusions and reflexions on the authors' finding are offered.

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TMS CONCEPT AND IMPLICATIONS

Concepts

To understand the operation of a Transactive Memory System (TMS), we first introduce the concept of transactive memory (TM) that was introduced by Wegner (1986) to understand how engaged couples coordinate to solve problems of information processing. Wegner concluded that under close interpersonal relationships people used each other as extensions or external memory aids, developing "a shared system to acquire, encode, store and retrieve information."

Applied to teams, TM is key for individuals or small groups to connect, creating knowledge flows, open and on-going communication and help to plan, coordinate and assign tasks according to each member's expertise to identify who knows what within the team. Also, if a member leaves the organization, the group can cover the gap (Austin, 2003; Wegner, 1987).

Moreland, Argote, and Krishnan (1996) argue that transactive memory systems develop faster and operate more efficiently when group members learn together rather than individually.

This collective memory system is developed while team members learn what the experiences, preferences, interests and abilities of the other members are. To maintain the effectiveness of transactive memory, members need to interact and continuously update information on the expertise of colleagues. Research indicates that the most effective teams are those whose members have a better understanding of each skill and appropriate strategies to access, share and use that expertise. In addition to the interaction and common experience, another factor that stimulates the development of the TM is training in which all members learn together to perform a certain task.

According to the theory of TM, the TMS also works properly in teams. Members of stable groups tend to distribute tasks, responsibilities and roles specializing in different domains of knowledge. This cognitive interdependence system helps people to free mental resources and to develop a deeper knowledge in certain domains, ensuring that the team has the necessary information to carry out their activity.

Different studies indicate that those teams whose members learn together to solve a task by themselves develop a differentiated knowledge of TMS, remembering together a greater amount of information relevant to the task than those teams whose members are trained separately (Austin, 2003; Moreland et al., 1996; Sánchez-Manzanares, Rico, & San Martin, 2007).

TMS refers to the division of labour between members of a team to acquire, remember and communicate relevant knowledge about the different activities they perform. TMS offers significant benefits to teamwork, such as helping to plan, coordinate and assign tasks according to each member's expertise to identify who knows what within the team (Sánchez-Manzanares et al., 2007). Also, finding the right team member to solve specific issues will help to solve problems faster and make optimal choices.

The initial classification of people into particular social categories provides important clues to determine, following a stereotyped process, their areas of expertise. However, an advanced TMS requires going beyond these first trials. Members of a team can learn more about their respective areas of expertise by establishing agreements about who is responsible for learning certain types of information, comparing the perceptions of their expertise in a particular field with judgments about the expertise of others, or knowing the sources of information that are accessible to colleagues.

These different mechanisms indicate that a TMS is being developed as people learn what the skills, experiences, preferences and interests of others are, which, in interdependent groups, occurs mainly through interaction and interpersonal communication.

As a result of the research into TMS, it was concluded that it is manifested in three dimensions:

- **Specialization:** Existence of a differentiated structure of knowledge in the team.
- **Credibility:** Mutual trust among team members regarding the validity of their knowledge.
- **Coordination:** The team's ability to effectively integrate their actions and knowledge.

Another concept related to transactive memory systems is WEP, which is the acronym used to denote the representation of tasks and work-experience unit-person; this concept was introduced as basic structures involved in the development of a TMS.

As a system transactive memory could have observable changes in time, it is proposed that a TMS can vary in terms of accuracy, sharedness, and validation. *Accuracy* is the degree to which perceptions of the knowledge of the other members of the task force are

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