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The enabling role of decision support systems in organizational learning

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Abstract

Organizations routinely process information, make decisions, and implement them. Recent advances in computer and communications technologies have changed the way in which organizations perform these functions. Decision support systems (DSSs) are a major category of tools that an organization utilizes to support and enhance its decision-making activities. Traditionally, organizations are considered to have a predefined and static set of goals. However, in order to stay competitive and survive in today's dynamic environment, organizations must be able to quickly respond and adapt to changes in their business settings. Such changes could be due to technological advances, growing and changing customer demands, competitive forces, changes in the labor force, environmental and political concerns, societal impacts, security concerns, and others. In recent years, the field of DSS has become more sophisticated to encompass such paradigms as expert systems (ESs), intelligent DSSs, active DSSs, and adaptive DSSs. Artificial intelligence (AI)-based techniques are being embedded in many DSS applications, thus enhancing the support capabilities of the DSS. Such paradigms have application potential in both individual and organizational learning contexts. However, the degree to which current DSSs can support organizational learning has yet to be investigated in depth. This paper examines the learning strategies employed by organizations and DSSs and provides a framework to demonstrate how a DSS can enhance organizational learning. © 2002 Elsevier Science B.V. All rights reserved.

Keywords: Decision support systems; Adaptive DSSs; Organizational learning; Artificial intelligence; Inductive learning

1. Introduction

Drucker [17] observed that the world is entering a post-industrial era in which availability and processing of information will become critical. Hence, organizations whose structures, processes, and technologies are not well suited to deal with the increasing environmental complexity and knowledge are unlikely to survive [32]. In order to survive and thrive in these ever increasing competitive markets and complex environments, organizations must continually learn and process new skills, knowledge, and routines about products, processes, and social relations.

Argyris and Schon [3] defines organizational learning as a process of detecting and correcting errors so that organizations are able to function and realize their goals and objectives. If organizations do not learn and adapt to their ever-changing environments, they face prospects of eroding their competitiveness and eventually, maybe, extinction.

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Exploration and controlled experimentation are essential factors of the learning process. One of the key factors that permits an organizational actor or a decision maker (DM) to take risks and seek varieties is directly related to the DM's personal preference and choice. Decision support systems (DSSs) can play a major role in enhancing the DM's decision-making abilities. In recent years, the field of DSS has become more sophisticated to encompass such paradigms as expert systems (ESs), intelligent DSSs, active DSSs, and adaptive DSSs. Such paradigms have application potential in both individual and organizational learning contexts. However, the degree and depth to which current DSSs supports organizational learning has yet to be investigated. This paper examines the learning strategies employed by DSSs and provides a framework to demonstrate how a DSS can support and enhance organizational learning. DSSs can support and enhance a DM's decision-making capabilities by processing data and allowing participants to simulate a variety of scenarios quickly and make effective decisions in an efficient manner. A DSS can also help to assess and compare the benefits and risks of exploration within the organization [32].

In spite of mutual linkages between the DSS and organizational learning, the concept of how a DSS can enhance and facilitate organizational learning has not been explored. This paper examines the learning strategies employed by DSSs and organizations and discusses different kinds of DSSs that can facilitate, promote, and enhance organizational learning. We believe this paper will be useful in providing guidance to managers, as managers in different companies are enamored by the concept of organizational learning and are looking for new ways to enhance and promote learning in their organizations. This paper also provides insights and an overview for researchers exploring the relationship between DSSs and organizational learning. The rest of the paper is organized as follows. In Section 2, we briefly discuss organizational learning and the nature of the resultant expertise. In Section 3, we present the different functions and characteristics of DSSs. In Section 4, we discuss the different DSS paradigms in terms of their underlying learning strategies to acquire and reorganize its knowledge and thus enhance the organization's performance. In this section, we also discuss the different ways in which DSSs can facilitate, support, and enhance learning in

organizations. In Section 5, we highlight the key attributes of DSSs that can promote and enable organizational learning. Section 6 discusses the potential future of using DSSs to facilitate and enhance organizational learning and Section 7 contains concluding remarks.

2. Organizational learning

Since the mid- and late-1980s, the subject of organizational learning has gained considerable attention among academicians and practicing managers. The importance of organizational learning can be attributed to the ever-changing, dynamic, and complex business environments. The way in which organizations acquire new skills and knowledge and at the same time exploit useful and discard obsolete and anarchic existing knowledge is a subject of inquiry [56].

Learning is considered necessary for knowledge creation. However, learning does not guarantee that knowledge learnt is useful and adaptive to the environments. In fact, exploitation of past knowledge can be useful only to the point when environments remain stable. If environments start changing, learning of existing rules and technologies can be an overhead to the organization and its members. It is very difficult to unlearn a well-learned program and/or method and start over with a new set of skills and learn new programs. Since knowledge creation is a dynamic process, unlearning existing programs and learning new sets of capabilities often become essential.

Organizations need to learn because they are open systems. They continually interact with external environments to sustain their long-term viability. If organizations act as closed systems, their long-term survival becomes questionable when environments change unpredictably. In an organization, however, not all organizational members interact in a similar fashion. Each of these individuals may have different, if not conflicting, views and may construct different models about the organization and its environments leading to incompatibility among these models and eventually the organization may not be able to realize its full potential. This is because organizational learning is not a simple aggregate sum of individual learning but is an exchange and sharing of individual assumptions and models throughout the organization.