Chapter 5.12

Towards the Realization of an Integrated Decision Support Environment for Organizational Decision Making

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ABSTRACT

Traditional decision support systems are based on the paradigm of a single decision maker working at a stand-alone computer or terminal who has a specific decision to make with a specific goal in mind. Organizational decision support systems aim to support decision makers at all levels of an organization (from executive, middle management managers to operators), who have a variety of decisions to make, with different priorities, often in a distributed and dynamic environment. Such systems need to be designed and developed with extra functionality to meet the challenges such as collaborative working. This article proposes an Integrated Decision Support Environment (IDSE) for organizational decision making. The IDSE distinguishes itself from traditional decision support systems in that it can flexibly configure and re-configure its functions to support various decision applications. IDSE is an open software platform which allows its users to define their own decision processes and choose their own exiting decision tools to be integrated into the platform. The IDSE is designed and developed based on distributed client/server networking, with

a multi-tier integration framework for consistent information exchange and sharing, seamless process co-ordination and synchronisation, and quick access to packaged and legacy systems. The prototype of the IDSE demonstrates good performance in agile response to fast changing decision situations.

INTRODUCTION

Over last several decades decision support systems (DSS) have experienced a paradigm shift from a stand-alone system that supports a single decision maker to make a specific decision, through group decision support systems (GDSS) to organizational decision support systems (ODSS). Through ODSS distributed decision makers interact with one another and their decisions are co-ordinated towards mutually defined goals, i.e. the goals of organizations. Organizational decision making is a demanding task because the decisions that need to be made involve all aspects of an organization including their products, technologies and personnel management. When considering the impact from the whole supply chain and global market such as end customers, material providers and product retailers, organizational decision making is further complicated. Due to the nature of organizational decision making in terms of its complexity, dynamics, multiple goals and often opaqueness, various types of decisions need to be made at different times and in distributed organizational units. Different decision processes or even multi-processes may be used. Further the decisions can be well-structured, semi-structured, ill-structured or unstructured (Lee et al., 1999). These decisions can also be made at different levels of organization such as strategic, tactical or operational. Therefore, decision support for organizational decision making is challenging, which has motivated broad interest in research on ODSS in recent years (Carter et al., 1992; Sen, Moore & Hess, 2000). Key challenges for organizational decision making have been widely

discussed including decision analysis across different levels (Humphreys & Bekerley, 1985), the management of multi-directional propagation of decisions: vertical, horizontal, or hub-and-spoke (Whitfield et al., 2007), and various presentation of decision problems (Holsapple, 2008). What lacks so far from existing work however is the success of mature decision support software which can address the dynamic nature of the business environment that today's organizational decision making situates (Vahidov & Kersten, 2004). New business situations crop up every day, to develop a new set of decision tools to deal with each new decision situation seems highly unrealistic. It is not only costly and time-consuming, but also it causes existing decision tools to become obsolescent, which could result in a tremendous loss of information, knowledge and business intelligence embedded within the tools (Szykman et al., 2001; Taghezout & Zarate, 2008). Therefore, it is increasingly important to allow the use of both new and existing tools to provide faster and better decision support without causing high cost economically or intellectually (Bangeman et al., 2006; Shi et al., 2007).

This article proposes a novel Integrated Decision Support Environment (IDSE) aiming to meet the new challenges of organizational decision making, in dynamic situations, through a hybrid integration approach. The IDSE has been designed for providing decision support capability where systematic decision making processes rather than emergent decision making processes are appreciated in the organization (Liu, Duffy, Whitfield et al., 2009). The article is organised as follows: Section 2 gives an overview of related work. An architecture of the IDSE is proposed in Section 3, followed by Section 4 focussing on an integration framework that enables IDSE functionality. Section 5 presents the development of an IDSE prototype and its application to a case study in organizational decision making context. Finally, Section 6 discusses further issues and draws conclusions.

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