Chapter VI

Managing Metadata in Decision Environments

G. Shankaranarayanan, Boston University School of Management, USA
Adir Even, Boston University School of Management, USA

Abstract

This chapter describes the implications for managing metadata, a higher-level abstraction of data that exists within repositories, applications, systems and organizations. Metadata is a key factor for the successful implementation of complex decision environments. Managing metadata offers significant benefits and poses several challenges, due to the complex nature of metadata. The complexity is demonstrated by reviewing different functions that metadata serves in decision environments. To fully reap the benefits of metadata, it is necessary to manage metadata in an integrated manner. Crucial gaps for integrating metadata are identified by comparing the requirements for managing metadata with the capabilities offered by commercial software products designed for managing it. The chapter then proposes a conceptual architecture for the design of an integrated metadata repository that attempts to redress these gaps. The chapter concludes with a review of emerging research directions that explore the contribution of metadata in decision environments.
Introduction

Metadata is data that describes other data. It is a higher-level abstraction of data that exists within repositories, applications, systems and organizations. Metadata is not a new concept and is typically associated with the “database catalog” or “data dictionary” — a component of database management systems that describes the database structure and constraints (Elmasri & Navathe, 2003). While the data dictionary is an important metadata component, it is only a small part of what we understand as metadata today. Metadata is more complex and has important managerial implications that are not yet well understood. Academia has examined metadata in the context of the Semantic Web (Berners-Lee, 1997) and industry experts have explored the technical requirements of metadata in data warehouses (Marco, 1998; Inmon, 2000; Imhoff, 2003). However, very few have attempted to understand and quantify the value of metadata in decision support environments. Metadata implementation in such environments is demanding, expensive and the end-result is rarely satisfactory. Investments in metadata solutions are hard to justify economically — metadata is primarily perceived as a technical necessity and its value to management is not apparent. Experts claim that metadata can improve decision making and enhance organizational knowledge (Marco, 2000; Stephens, 2004). These claims have rarely been validated.

The objective of this chapter is two-fold. First, we describe the current state of metadata in decision environments. We then highlight the changing perception of metadata as a useful tool for supporting business professionals in decision making. The section Metadata in Complex Decision Environments examines metadata from a functional perspective and offers a categorization of metadata that demonstrates the myriad of different functions that metadata serves. Metadata Management in Commercial Data Warehousing Products describes the benefits of metadata, as well as the challenges with implementing/managing metadata. The challenges are further underscored by highlighting the mismatch between the capabilities offered by commercial products for managing metadata and the functional requirements necessary for managing metadata. An integrated metadata repository attempts to address these challenges. A conceptual design for the integrated metadata repository is presented along with a set of alternative approaches for implementing it. The section entitled Applications of Metadata draws attention to recent trends that radically change the perception of metadata — from a technology component, useful for data management and integration, to a powerful aid that supports managerial decision making. Two metadata types — quality and process — are shown to aid managerial decision making, specifically in the context of analytical, data-driven decision tasks. Several interesting research questions to guide future research on metadata are...
Identifying Critical Success Factors for Supply Chain Excellence
[www.igi-global.com/article/identifying-critical-success-factors-supply/46128?camid=4v1a](www.igi-global.com/article/identifying-critical-success-factors-supply/46128?camid=4v1a)

Developing Strategies For Competitive Advantage
[www.igi-global.com/chapter/developing-strategies-competitive-advantage/29706?camid=4v1a](www.igi-global.com/chapter/developing-strategies-competitive-advantage/29706?camid=4v1a)