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Chapter XI

The Metaphorical Implications of Data Warehousing

Elizabeth J. Davidson
University of Hawai'i Manoa

Metaphors have long pervaded the discourse around information technology (IT) design (Johnson, 1994), helping developers to conceptualize technological features and functions, to design human-computer interfaces (Rechtin, 1997; Golovchinsky and Chignell, 1997; Rauch, Leone, and Gillinhan, 1997), and to articulate application requirements (Boland and Greenburg, 1992; Davidson 1996a). Metaphors also play an important role in conveying what Swanson and Ramiller (1997) call the organizing vision for IT innovations. An organizing vision, which develops through the discourse of a community of technology producers, information systems (IS) professionals, business managers, and other stakeholders, provides an interpretation of the applications of an IT innovation and the rationale for its use. Buzzwords are labels or names that come to be identified with an organizing vision and "may serve as a potent metaphor" (Swanson and Ramiller, 1997, p. 463) for conceptualizing the roles, relationships, control mechanism, and work processes associated with the IT innovation.

Data warehousing is one such metaphor. Drawn from practices for materials management in manufacturing and distribution operations, this metaphor has been used to conceptualize organizational processes for gathering, storing, and distributing firm-wide data for business analysis and to define the applications of technologies such as multidimensional and relational databases and on-line analytic processing software in these processes. In the last decade, this IT innovation has become a key area for information systems development as many firms have undertaken the construction and operation of so-called data warehouses. Design concepts for data warehousing and experiential reports on their development have received considerable attention in the business press (Sakaguchi and Frolick, 1997) and from professional associations such as the Data Warehouse Institute. Data

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warehousing has also become a subject of academic research, where research has focused primarily on technology design issues.

The data warehousing metaphor has undoubtedly served as a valuable cognitive device for conceptualizing the technical design of corporate-wide, informational databases. However, this metaphor also has implications for the meaning and utility of data used by business analysts and for end users' relationships with IS staff, that have not been fully explicated and debated. As more companies commit to a data warehousing strategy, it becomes increasingly important to balance the technological design perspective with a human-centered perspective in order to facilitate our understanding of the value, limitations and consequences of adopting this IT innovation. The objectives of this chapter are to explore data warehousing from the human centered perspective, first by examining the data warehousing metaphor and its implications for organizing IT support of business analysis activities. Then, the consequences of relying on the data warehousing metaphor as a conceptual model for designing the social aspects of business analysis processes are considered in a review of findings from a field study of a data warehousing project. Finally, the chapter considers the limitations of the data warehousing metaphor and explores alternative metaphors to highlight the human dimensions of this IT innovation.

BACKGROUND: THE METAPHORICAL IMPLICATIONS OF THE DATA WAREHOUSE

Metaphor is a central cognitive mechanism that enables human beings to create and comprehend abstract concepts (Lakoff and Johnson, 1980). A metaphor provides a set of conceptual mappings between a source domain of knowledge and experience and the target domain that are expressed in idiomatic expressions and used to communicate thoughts and interpret events (Lakoff, 1993; Ortony, 1979). Metaphors are particularly helpful when new phenomena are encountered, providing a vocabulary drawn from familiar circumstances to facilitate discourse in the new domain (Weick, 1979; Morgan, 1986).

The data warehousing metaphor is drawn from experiences with the management of physical materials in manufacturing and distribution processes. In its original context, warehousing is the management of materials while they are in storage, including storing, dispersing, ordering, and accounting for all materials (Gaither, 1992). Warehousing ensures materials are available when needed by providing an inventory buffer between material suppliers and production processes, while reducing inventory costs through efficient purchasing and materials handling operations. Similarly, one of the primary motives for creating a data warehouse is to provide a data buffer between operational systems and business analysis activities, allowing each process to run efficiently and independently (Hathathorn, 1995; Orr, 1997; Sakaguchi and Frolick, 1997). Data warehousing concepts are also drawn from related materials management activities such as purchasing. The mission of purchasing is to develop and implement purchasing plans for each major product or service, select suppliers, negotiate contracts, and act as the interface between the company and supplier (Gaither, 1992). Analo-