Chapter 4.14
Managing the Implementation of Business Intelligence Systems:
A Critical Success Factors Framework

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ABSTRACT

The implementation of a BI system is a complex undertaking requiring considerable resources. Yet there is a limited authoritative set of CSFs for management reference. This article represents a first step of filling in the research gap. The authors utilized the Delphi method to conduct three rounds of studies with 15 BI system experts in the domain of engineering asset management organizations. The study develops a CSFs framework that consists of seven factors and associated contextual elements crucial for BI systems implementation. The CSFs are committed management support and sponsorship, business user-oriented change management, clear business vision and well-established case, business-driven methodology and project management, business-centric championship and balanced project team composition, strategic and extensible technical framework, and sustainable data quality and governance framework. This CSFs framework allows BI stakeholders to holistically understand the critical factors that influence implementation success of BI systems.

BACKGROUND

Engineering asset management organizations (EAMOs), such as utilities and transportation enterprises, store vast amounts of asset-oriented

data (Lin et al., 2007). However, the data and information environments in these organizations are typically fragmented and characterized by disparate operational, transactional and legacy systems spread across multiple platforms and diverse structures (Haider & Koronios, 2003). An ever-increasing amount of such data is often collected for immediate use in assessing the operational health of an asset, and then it is either archived or deleted. This lack of vertical integration of information systems, together with the pools of data spread across the enterprise, make it extremely difficult for management to facilitate better learning and make well-informed decisions thus resulting in suboptimal management performance. Yet large volumes of disperse transactional data lead to increased difficulties in analyzing, summarizing and extracting reliable information (Ponniah, 2001). Meanwhile, increased regulatory compliance and governance requirements have demanded greater accountability for decision making within such organizations (Logan & Buytendijk, 2003; Mathew, 2003). In response to these problems, many EAMOs are compelled to improve their business execution and management decision support through the implementation of a BI system.

According to Negash (2004), "BI systems combine data gathering, data storage, and knowledge management with analytical tools to present complex and competitive information to planners and decision makers." Implicit in this definition, the primary objective of BI systems is to improve the timeliness and quality of the input to the decision making process (Negash, 2004). Data is treated as a corporate resource, and transformed from *quantity* to *quality* (Gangadharan & Swami, 2004). Hence, actionable information could be delivered at the right time, at the right location, and in the right form (Negash, 2004) to assist individual decision makers, groups, departments, divisions or even larger units (Jagielska et al., 2003). Fisher et al. (2006) further posited that a BI system is primarily composed of a set of three complementary data management technologies, namely data warehousing, online analytical processing (OLAP), and data mining tools.

A successful implementation[1] of BI system provides these organizations with a new and unified insight across its entire engineering asset management functions. The resulting unified layer, in reporting, business analysis, and forecasting assures consistency and flexibility (Gangadharan & Swami, 2004). Critical information from many different sources of an asset management enterprise can be integrated into a coherent body for strategic planning and effective allocation of assets and resources. Hence, the various business functions and activities are analyzed collectively to generate more comprehensive information in support of management's decision-making process.

BI systems come as standardized software packages from such vendors as Business Objects, Cognos, SAS Institute, Microstrategy, Oracle, Microsoft and Actuate, and they allow customers to adapt them to their specific requirements. In recent years, the BI market has experienced extremely high growth as vendors continue to report substantial profits (Gartner, 2006a; IDC, 2007). Forrester's recent survey indicated that for most CIOs, BI was the most important application to be purchased (Brunelli, 2006). The results of the latest Merrill Lynch survey into CIO spending similarly found that the area with the top spending priority was BI (White, 2006). These findings are echoed by Gartner's CIOs priorities surveys in 2006 which revealed that BI ranked highest in technology priority (Gartner, 2006b). In the most recent survey of 1400 CIOs, Gartner likewise found that BI leads the list of the top ten technology priorities (Gartner, 2007).

INTRODUCTION AND RESEARCH MOTIVATION

While BI market appears vibrant, nevertheless the implementation of a BI system is a financially large and complex undertaking (Watson et al.,