How Business Intelligence Creates Value: An Empirical Investigation

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ABSTRACT

This study examines the business value associated with business intelligence (BI) systems, based on the premise that business value is largely contingent on system type and its unique contribution. The study adopts a process-oriented approach to evaluating the value contribution of BI, arguing that it stems from improvements in business processes. The study develops and tests a research model that explains the unique mechanisms through which BI creates business value. The model draws on the resource-based view to identify key assets and capabilities that determine the impact of BI on business processes and, consequently, on organizational performance. Analysis of data collected from 159 managers and IT/BI experts, using structural equation modeling (SEM) techniques, shows that BI largely contributes to business value by improving both operational and strategic business processes.

Keywords: Business Intelligence (BI), Business Value, Operational Processes, Resource-Based View (RBV), Strategic Processes, Structural Equation Modeling (SEM)

INTRODUCTION

A plethora of studies have examined the business value of information technology (IT), increasingly showing evidence of contribution and positive organizational impact. This stream of research, however, has predominantly focused on the business value of an overarching IT concept and has paid less attention to the value gained by specific classes of systems. This study suggests that IT business value largely depends on system type and, therefore, its evaluation requires a careful analysis of the unique manner by which each category of systems creates business value. This study focuses on the business value of business intelligence (BI) systems, which are considered in today’s business environment as a promising source of IT business value. BI
systems represent the natural evolution of decision support systems (DSS) and put a strong emphasis on data-driven decision making, based on the integration of multiple data resources that reflect different aspects of organizational activity. Our underlying assumption is that BI is unique in its potential to generate both strategic and operational value through the seamless integration of organizational data to support decisions at different levels. Although BI is considered by industry as a significant source of business value, little research has examined this value and the mechanisms through which it is generated.

This study, therefore, addresses three key questions: (1) What is the business value generated by the implementation of BI systems? (2) What are the mediating mechanisms through which this value is generated? (3) Are those organizational impacts and mediating mechanisms affected by such firm characteristics as industry, firm size, and previous experience with BI? This study takes a process-oriented approach to evaluating the impact of BI on organizational performance (Elbashir, Collier, & Davern, 2008a; Popovic, Turk, & Jaklic, 2010), arguing that the business value of BI stems from its contribution to the improvement of key business processes. Drawing on the resource-based view (RBV) of the firm, we develop a research model that identifies key BI assets and capabilities as possible explanatory factors of the impact of BI on business processes and performance. The analysis is based on data collected from 159 managers and industry experts in the BI domain. It shows that BI contributes to business value by improving both operational and strategic business processes.

In the remainder of this work, we first review empirical studies that observed the effect of BI on firm performance. These studies provide us with some theoretical background, upon which we develop our research model and hypotheses. Following a description of our research methodology and data collection procedures, we analyze the data using structural equation modeling (SEM) techniques and we discuss the results and their implications. We conclude by highlighting the key contributions of the study, discussing its limitations, and proposing directions for future research.

THEORETICAL DEVELOPMENT

DSS for aiding organizational and managerial decision-making processes started to emerge in the 1960s and 1970s. BI, as an overarch term for DSS that are based primarily on integrated organizational data resources, was introduced as a set of concepts and methods to improve fact-based decision making. BI tools aim at improving the quality and accuracy of information used in decision making processes by simplifying the storage, identification, and analysis of information (Negash, 2004). BI systems let users at all organizational levels access data, interact with it, and analyze it toward improving business performance, discovering new opportunities, and increasing efficiency. Well-designed BI systems offer a global view of the entire organization, permit analysis of business activities from multiple perspectives, and enable rapid reactions to changes in the business environment (Matei, 2010).

Some studies have emphasized the organizational impact of BI, suggesting that the introduction of BI systems implies not only technological enhancement but also a revolution in the way that business activities and decision-making processes are performed and managed. The main objective of this study is to better understand the mechanisms through which investments in BI systems and their integration into business processes contribute to the creation of business value. Further, the study wishes to examine whether or not certain organizational characteristics (e.g., industry sector, firm size, and the level of experience with BI) affect the transformation of investments in BI into business value. As a preliminary step toward better understanding the impact of BI on business value, we have reviewed 20 empirical papers (mostly case studies or survey-based studies) that examined this issue from different aspects. Table 1 summarizes the findings of our literature review.
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