Critical Success Factors of Enterprise Data Analytics and Visualization Ecosystem: An Interview Study

Mohammad Daradkeh, Yarmouk University, Irbid, Jordan

ABSTRACT

With the huge proliferation of Big Data, combined with the increasing demand for analytics-driven decision-making, the data analytics and visualization (DAV) ecosystem is increasingly becoming a trending practice that many enterprises are adopting to gain actionable insights from corporate data for effective decision-making. Although DAV platforms have tremendous benefits, extant research has paid insufficient attention to the investigation of the critical success factors (CSFs) underpinning their successful implementation in enterprises. In order to bridge this knowledge gap, this study presents an integrative framework synthesizing a set of CSFs for implementing DAV platforms in enterprises. A qualitative research methodology, comprising semi-structured interviews with IT and business analysts, was conducted to collect and analyze the interview data. Analysis of results revealed that the CSFs of DAV implementation exist in various dimensions composed of organizational, technological, process, and people perspectives. This study provides several theoretical and practical implications.

KEYWORDS

Analytics-Driven Decision-Making, Big Data, Critical Success Factors (CSFs), Data Analytics and Visualization (DAV) Ecosystem, Decision Support, Enterprises, Qualitative Research

INTRODUCTION

The current business ecosystem is characterized by the rapidly increasing scale, complexity, and rate of change of business data. Enterprises generate and accumulate an immense quantity of data, which has become a key asset for leveraging business analytics and sustaining a competitive advantage (Sharda, Delen, & Turban, 2017). These enterprises rely heavily on business analytics to optimize operations, improve production, inform sales and decisions, prevent threats and fraud, and strengthen customer engagement (Basole, 2014; Daradkeh, 2017a). However, the growing silos of data that enterprises continue to amass impose significant challenges on business analysts and decision-makers to comprehend and make strategic and operational decisions. As most of today’s enterprises are transforming into analytics-driven enterprises, this also requires that business users across the enterprise become comfortable with, and sophisticated in, using data and analytics for decision-making (Daradkeh, 2017b). The growing demand for analytics-driven decisions, combined with the huge proliferation of big data, provides a strong motivation for enterprises to implement data...
analytics and visualization (DAV) ecosystem to ascertain valued knowledge and actionable insights from corporate data to support decision-making (Daradkeh, 2015).

The DAV ecosystem is an emerging capability for a wide range of business users, including business analysts, data scientists, information officers, and corporate decision-makers (Basole, 2014). It enables the discovery of new business insights, identification of crucial patterns, analysis of trends, and identification of outliers. It also makes business data more accessible and provides an effective means for improved communication and information sharing (Sedlmair, Michael, Isenberg, Baur, & Butz, 2010). Today’s business analytics software, especially in the area of self-service business analytics, is no longer accepted by business users without interactive and intuitive user interfaces that offer them with different visualization options (Daradkeh, & Al-Dwairi, 2017; Kohlhammer, Proff, & Wiener, 2016). An interactive DAV ecosystem is particularly valuable because it moves beyond traditional static business reports and performance indicators to mapping, exploration, discovery, and sensemaking of complex business ecosystems (Basole, Huhtamäki, Still, & Russell, 2016). Consequently, enterprises using DAV ecosystem can comprehend hidden meanings in data, predict and solve business problems in ways that increase enterprise knowledge, implement new business model, optimize decision-making processes, and establish and achieve business goals effectively (Basole et al., 2016).

Owing to their numerous explorative and communicative advantages, various DAV platforms have recently attained a widespread acceptance and deployment in enterprises of different types and sizes. A recent survey by Gartner (2017) reported that visual-based data analytics platforms are ranked among the top technology priorities of many enterprise analysts in 2017, with expectation to comprise 80 percent of all reporting and analytics activities of enterprise by 2020. The major forces driving enterprises to adopt DAV ecosystem can be traced back to the constantly changing needs of corporate analysts and decision-makers for information and analytics and the demand for real-time collaboration and information sharing (Kohlhammer et al., 2016). The proliferation of cloud-services and mobile technologies have also contributed significantly to the widespread implementation of DAV solutions within enterprises (Sharda, Delen, Turban, Aronson, & Liang, 2015). With the support of DAV ecosystem, enterprises are enabled to promote a cultural shift toward more analytics-driven business and operations by empowering business users to explore data and generate actionable insights that they can employ readily to enhance business knowledge, improve customer services and satisfaction, and help in reforming business processes (Daradkeh, M., in press).

While the DAV market appears proliferated and the importance of DAV ecosystem is becoming more widely accepted, the critical success factors (CSFs) underpinning the implementation of DAV projects in enterprises are insufficiently investigated. The literature on DAV ecosystem provides a plethora of guidelines for the implementation of DAV platforms in enterprises (Basole, 2014; Basole et al., 2016; Booshehrian, Möller, Peterman, & Münzner, 2012; Daradkeh, 2017b; Kandogan, Balakrishnan, Haber, & Pierce, 2014; Thomas, J. & Cook, 2005). However, most of these guidelines either lack the required clarity of a general purpose standard, or are limited to addressing technical issues of a particular system or business type. This is because the study of DAV ecosystem is a relatively new area that has been primarily driven by the IT industry and business analytics vendors. To attain the full benefits of leveraging DAV ecosystem, enterprises should be able to address implementation challenges effectively (Lam, Bertini, & Isenberg, 2012), orchestrate the implementation process and resource configurations (Chinchor, Cook, & Scholtz, 2012), as well as understand the needs and requirements of business users for reporting and analytics (Kandel, Paepcke, Hellerstein, & Heer, 2012). Therefore, empirical research to explore and identify the set of CSFs that contribute to the successful and effective implementation of DAV ecosystem in enterprises is crucial.

The main purpose of this study is to develop a framework synthesizing the salient CSFs and provide a contextual understanding of their contribution to the implementation of DAV ecosystem. In the absence of much literature on this topic, semi-structured interviews with twenty IT and business analysts from seven enterprises across a variety of industries, were conducted to gather
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