



## KNOWLEDGE MANAGEMENT AND BIG DATA –DATA DRIVEN KNOWLEDGE BASE

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**ABSTRACT-** Major issue with the business organizations is the unstructured data. This data is huge and normally spread across the organization in a different formats. In some occasions the data remains as just knowledge with some human resources. Managing all these different knowledge bases is becoming more challenge to the organizations. In order to safeguard the right knowledge, organizations spend lot of time and investment to build big data storage systems and knowledge base systems to read from there. The vast amounts of information can be collected, filtered and organized and be made available to those who need it in a format in which they need. Knowledge Management leads to the success of an organization. It is the management of knowledge built using the earlier experiences to reduce the rework involved so the cost, duration or both on re-production can be reduced. Also it helps to leverage the collective knowledge and experience of an organization to accelerate innovation and sharpen competitive advantage. In the recent times, many enterprises are investing in better Knowledge Management and Business Intelligence techniques in order to provide more value to their business. There are lot of techniques used by these organizations to analyze, create and

utilize knowledge management data. As the data in available in several different forms, it is important to have multiple ways to deal with it. In this paper we will analyze the ways to build an effective knowledge management system from Big Data which can be used to effectively utilize an organization growth area.

### Introduction

The development and use of Knowledge Management Systems (KMSs) are currently having a direct and dramatic impact on business decisions and processes in modern and networked organizations (Kapuruge 2011). KMSs render organizations more competitive to grasp more business opportunities (Alavi and Leidner 2001; Djordjevic-Boljanovic et al. 2013). However, these KMSs are currently confronted with a variety and unprecedented amount of data, resulting from different business and IT-based services, called “big data” (Chen et al. 2012). Big data provides high-volume, high-velocity and high-variety information assets that leads to a revolution of transforming traditional organizations into knowledge-intensive ones, called Data-Driven Organizations (DDOs). Consequently, knowledge discovered in DDOs needs to be translated from



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big data into organizational knowledge to aid managers in making decision and in improving performance (Chen et al. 2012). Despite the fact that big data research has recently gained rapid growth, there is a lack of frameworks and architectures that enable DDOs to capture the value of big data in a systematic manner, especially for promoting organisational learning (Wang et al 2015;

Olivo et al. 2016). Indeed, one of the most important challenges for KMSs today is to be able to deal with big datasets that are required to be updated frequently or continuously. Therefore, a new generation of KMSs that is able to handle efficiently big data sources becomes an essential tool for organizations, especially DDOs. In fact, most of the recent studies, which are related to the integration of big data and KMSs, have separately concentrated on specific aspects of knowledge management such as business intelligence and business analytics (Chen et al. 2012), data mining and knowledge discovery (Begoli and Horey 2012; Wu et al. 2014). These studies have strongly focused on knowledge exploration, but have not been fully supported knowledge exploitation yet. There has been little attempt to take into account the impact of big data on the whole process of organizational knowledge management and the trend of service orientation.

## **Literature Review Knowledge Management Systems and Big Data**

In this research context, data consists of traditional data and big data. Knowledge is constituted from

knowledge objects, which are classified on the basis of their level of development, that is, as data, information, knowledge or wisdom (Bierly III et al. 2000). Knowledge management (KM) is defined as organizational activities related to knowledge artefacts in which a learning process has occurred, and intellectual capital is accumulated and developed. Knowledge artefacts are data or information collected from existing systems, social networks, telecommunication networks, and mobile services. Knowledge management systems represent a specific type of information systems applied to handle organizational knowledge (Alavi and Leidner 2001), that includes activities such as knowledge capture, knowledge organization, knowledge transfer and knowledge application (Le Dinh et al. 2015). The backbone of KMSs is the knowledge architecture, which is the application of information architecture to knowledge management that supports and enhances the KM activities. Big data brings a great opportunity but also a big challenge for implementing KMSs in DDOs (Beyer and Laney 2012). The importance of big data does not revolve around how much data organizations have today, but what business value they can distill from this data in the best manner and within the shortest response time. In the global competitive environment, organizations, which are able to leverage effectively big data through KMSs, can differentiate themselves from their rivals. However, there is a great challenge for DDOs for handling the immense volumes of data, which are being continuously generated on an hourly basis. Hence, a huge computing power for analytics, which is required to handle the unprecedented input, creates significant barriers for



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organizations to harness effectively the business value of big data. Service Orientation Service Orientation (SO) is a design paradigm for software applications constituted by services (Erl 2005). It offers critical features such as standardization, platform independence, well-defined interfaces, and various tools that support the integration of legacy and new systems. Accordingly, SO rapidly becomes a popular architectural approach used to implement distributed and loosely coupled systems (Yang 2013). Service-oriented architecture (SOA) is a design architecture for constructing information systems by the combination of services. The heart of SOA is a set of standard approaches for designing and sharing reusable services and an implementation of distributed and loosely coupled services. The SOA approach satisfies several business goals such as interoperability, maintainability, modifiability, extensibility, availability, reliability, security, and performance. These are the primary drivers for adopting SOA as a set of design principles for service-oriented systems. Related Work Conventional knowledge management systems were not prepared well for storing, processing and analyzing big data because they mainly use traditional databases (Jurisica et al. 2004). A survey of current research projects related to big data indicated that most of them have had only focused on specific aspects of KM such as big data management, business analytics, business intelligence, and decision-making (Chen et al. 2012). Recently, some studies related to big data and knowledge management have additionally mentioned on other aspects such as methods for building knowledge bases (Suchanek and Weikum

2014), data mining and knowledge discovery (Begoli and Horey 2012; Wu et al. 2014), knowledge fusion based on machine learning (Dong et al. 2014), deep learning (Yu 2013) and random walk inference (Lao et al. 2011), and real-time stream data processing (Esposito et al. 2015). However, these studies did not provide Towards an Architecture for Big Data-Driven Knowledge Management Systems Twenty-second Americas Conference on Information Systems, San Diego, 2016 3 a comprehensive architecture for supporting the complete process of knowledge development as well as the collaboration of their systems to support organizational learning (Wang et al. 2015; Olivo et al. 2016). On the other hand, the service orientation approach was regarded as a flexible, agile, and powerful approach for implementing KMSs (Šaša and Krisper 2010; Dai and Rubin 2012). Service oriented KMSs explored the management of resources as services, and exploited the flexibility of information systems. Unfortunately, these systems did not consider the opportunities being presented by big data. In addition, there is still a little concern for the knowledge fusion of traditional data and big data, as well as for the comprehensive process of knowledge development. In order to overcome the above challenge, we propose a general architecture for BDD-KMSs based on service-oriented principles. Our architecture supports the whole knowledge management process in a DDO in order to provide a unified way of working, learning and innovating in the big data era.

## Conclusion



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In the era of big data, one of the most important characteristics of knowledge management systems (KMSs) should be big data-driven to leverage all available data as a competitive advantage. We presented a service-oriented architecture for implementing big-data driven KMSs (BDD-KMS). It is the first serviceoriented architecture that concentrates on reconciliation of big data and KMSs to facilitate organizational learning based on the perspective of knowledge objects (Olivo et al. 2016). Our approach aims at adding more business value from big data and at facilitating knowledge development and organizational learning. Big data has transformed enterprises into data-driven organizations, which require the foundation to transform data into knowledge, optimize decisions, and maximize profits. The approach helps data-driven organizations to build a new-generation of KMSs based on the service orientation that support the organizational knowledge development process and the unification of knowledge derived from diverse (big) data sources. By applying service-oriented principles, an organization can manage and govern business and digital transformation, setting them apart from their competitors. The benefits include seamless integration, cloud enabled solutions, holistic business insight and organizational agility.

## REFERENCES

1. Alavi, M., and Leidner, D. E. 2001. "Review: Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues," MIS Quarterly (25:1), pp. 107-136. 2. Assunção, M. D., Calheiros, R. N.,

Bianchi, S., Netto, M. A. S., and Buyya, R. 2015. "Big Data computing and clouds: Trends and future directions," Journal of Parallel and Distributed Computing: Special Issue on Scalable Systems for Big Data Management and Analytics (79-80), pp.

3. Begoli, E., and Horey, J. 2012. "Design principles for effective knowledge discovery from big data," in Software Architecture (WICSA) and European Conference on Software Architecture (ECSA), 2012 joint working IEEE/IFIP conference on, M. Ali Babar, C. Cuesta, J. Savolainen, and T. Männistö, Helsinki, Finland, pp. 215-218. Bellenger, G. 2004.

4. "Creating Knowledge Objects," (available at <http://www.systemsthinking.org/cko/guide.htm>).

Bellinger, G., Castro, D., and Mills, 2004.