

Big Data -The Future of the Next Big World

Mohammad Azhar

Dept. of Computer Science Engineering
Malla Reddy Institute of Technology , Secunderabad
Hyderabad , A.P., India
azharcse15@gmail.com

Abstract - Big data analytics has come out as a new important field of study for both researchers and practitioners, demonstrating the significant demand for solutions to business problems in a data-driven knowledge-based economy. Additionally, empirical studies examining the impacts of the nascent technology on organizational performance, especially the influence of organizational culture each type of organizational culture – hierarchy, clan, adhocracy, and market – has impacts on each Big V of big data. The framework suggests that firms, influenced by their organizational culture, have different views on how important each Big V's should be. The study argues that organizations should develop, nurture, and maintain an adhocracy organizational culture that has a positive impact on each of the five Big V's to harness the full potential of big data.

Keywords- Big Data, Five Big V's, Volume, Velocity, Variety, Veracity, Value, Organizational Culture

I. INTRODUCTION

The availability of different organizations have different cultures, which may lead to the situation that their approaches to dealing with enormous volumes, extremely high velocity, great variety, little veracity, and significant value of big data are very different. The extant literature reveals that empirical studies examining the relationships between organizational culture and the five big V's of big data are still scarce. This study aims to fill the gap by investigating the following research questions:

The ubiquitous availability of internet connections using broadband networks along with the advent of sensors, advanced mobile technologies, and high-performance computing devices leads to a situation in which firms have been overwhelmed by the staggering amount of data collected via digital interactions with consumers.

According to [8], different organizations have different cultures, which may lead to the situation that their approaches to dealing with enormous volumes, extremely high velocity, great variety, little veracity, and significant value of big data are very different. The extant literature reveals that empirical studies examining the relationships between organizational culture and the five big V's of big data are still scarce.

- How do firms with different types of organizational culture emphasize the importance of each of the five big V's – volume, velocity, variety, veracity, and value – of big data?
- What is the influence of the organizational culture on each of these big data big V's?

II. LITERATURE REVIEW

1. Five Big V's of Big Data

For big data [2], volume refers to the amount of data created in a unit of time – either second, minute, hour, or day. Velocity, refers to how fast new data are generated and transmitted, while variety indicates different formats of data that are generated in big volume. It is noticeable that velocity also indicates how quickly a firm reacts based on the business intelligence that can be extracted from the big data. Veracity refers to the fact that the quality and accuracy of the data may be not at the high levels, i.e., less uniformed, consistent, and controllable. The fifth V is “value” that refers to the individual or organizational capability of turning big data into real values, which includes an ability to collect and then leverage the data to achieve specific goals.

2. Organizational Culture

Organizational culture can be examined at three levels: Artifacts, assumptions, and values. In the literature, researchers mostly depend on the values level to conduct their study on organizational culture. Additionally, two prominent frameworks of the culture in organization – National Culture Framework [3] and Competing Value Framework [6] – are based on this level, the values [3, 6].

III. INDUCTIVE PROCESS

1. Four Categories of Organizational Culture

With the CVF, [1] classified firms into four groups based on their organizational culture in the organizational cultural model (OCM): Hierarchy organizational culture (HOC), Clan organizational culture (COC), Adhocracy organizational culture (AOC), and Market organizational culture (MOC).

2. Hypotheses

Firms with the AOC focuses on creativity and innovation. They invest heavily in new ideas and try to collect as much as data they can. With big data analytics, data size has a significant positive relationship with data variety. Similarly, more data in more formats means higher levels of inconsistency and uncontrollability, i.e., “higher” levels of veracity. Also, these firms quickly apply what they can learn from data into their operations to improve performance. AOC enables firms to be more competitive by taking advantage of the first four big V’s of big data. The extant literature presents empirical evidence of a link between competitiveness and firm productivity. In turn, improved productivity leads to superior organizational performance, including profitability.

As a result, AOC-ed firms can harness the full potential of big data. Therefore, Hypothesis 1 and 2 are proposed. By breaking-down the classical-approaches’ position, in this paper we propose a new vision whose main idea consists in ensuring the privacy of big data sources in distributed environments via an innovative data-driven approach, i.e. an approach that mainly investigates (big) data rather than executing check procedures of service-oriented protocols, in order to reduce the overall complexity overhead of the target system. Indeed, contrary to classical initiatives, our approach tries to recognize the “pedigree” of suitable summary data representatives computed on top of the target big data repositories, hence avoiding computational overheads due to protocol checking.

IV. BIG DATA DRIVEN METHODOLOGY

It shows a typical application scenario of our proposed data-driven privacy-preserving big data management framework. Here, the following big data sources are recognized:

- Big Social Data: here, social data coming from different social networks, such as Twitter, Facebook, LinkedIn, and so forth, are identified;
- Big Legacy Data: this big data source stores legacy data coming from legacy applications, such as government data, work data, scheduling data, and so forth;
- Big Event Data: here, event data, such as calendar data, organization data, contact data, and so forth, are located;
- Big Profile Data: this big data source stores profile data coming from user’s activities, such as smart-phone data, network data, profile-metrics data, and so forth.

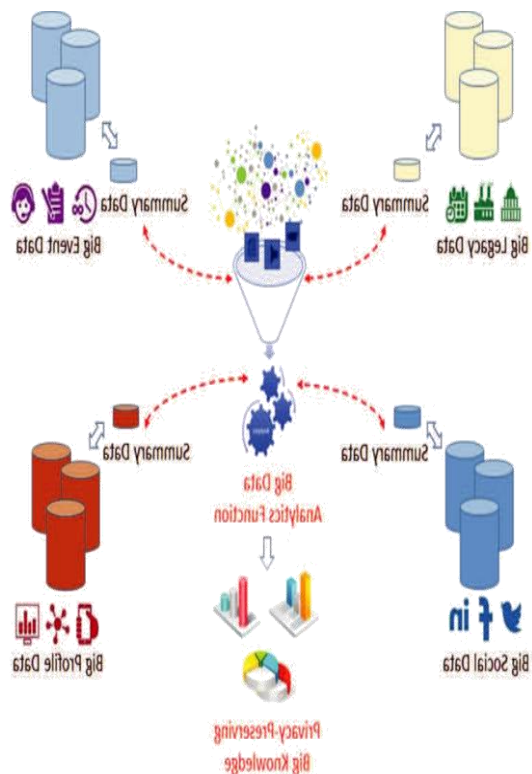


Figure 1. Big Data Analytics Performance.

V. RESEARCH METHODOLOGY

A survey will be administered to collect data from high-ranked officers involved in collecting and managing data, e.g., Chief Data Officers (CDO), in firms headquartered in North America and the European western developed countries. The analysis unit will be the firm. The service of a market research firm will be employed to create an appropriate sample. The scales introduced by [4] will be used to measure organizational culture. Due to the nascent state of research on big data, no well-established measures of the five Big V’s are available. To measure the extent to which firms focus their attention and investments on each Big V, scale development method suggested by [5] will be adopted. All the five phases of the procedure will be followed: Conceptualize the construct, develop measures, specify models, evaluate and refine scale, and finally validate and establish the norm.

VI. CONCLUSION

The proposed theoretical framework is based on the OCM of The framework presents an overview of all four groups of firms based on their organizational culture. Furthermore, the framework allows the audience to identify the organizational cultural characteristics of each

group and how each group influences each of the Big V of big data. For instance, based on the framework, an adhocracy firm tends to focus on innovation and creativity, to be flexibility-oriented, and have positive impacts on all the five Big V's whereas a hierarchy company has a negative influence on all the five Big V's. Many companies of different sizes have considered big data as one of the top priorities that should get significant time and attention from the top. All organizations that have put enough efforts and investments in their big data business strategy and executed it soundly can harvest the results via gaining competitive advantage and improving performance. Based on the proposed framework, to harness the full potential of big data, a firm should develop, nurture, and maintain an adhocracy organizational culture that has a positive impact on each of the five Big V's of big data. As a result, all the employees are empowered to contribute to the process of making data-driven decisions.

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Author Profile



Mohammad Azhar Computer Science Department
Hyderabad ,India

