International Journal of Advances in Engineering and Management (IJAEM)
Volume 3, Issue 6 June 2021, pp: 347-349 www.ijaem.net ISSN: 2395-5252

Effective strategies for the Big Data implementation in Business Management

Dr. Jyotshna Dongardive[1], Dr. Sampada Malhar Margaj[2], Malhar Chandrakant Margaj[3]

[1] *Department of Computer Science, University of Mumbai, Mumbai*
[2] *Department of Computer Science, Kirti M. Doongursee College, Dadar, Mumbai*
[3] *BIU, Tata AIA Life Insurance Company Limited*

Submitted: 25-05-2021 Revised: 01-06-2021 Accepted: 05-06-2021

ABSTRACT - In the today's world of business, data is playing a crucial role. The complexities in handling data are also growing with the time so there is a need of finding new solutions for efficient data processing and analysis. Present study is based on how to efficiently handle the two important aspects of Big data analytics - one is resource management and another is operational strategy for the effective implementation of Big Data solutions in business management.

I. INTRODUCTION

Data, information, knowledge have always played a critical role in business[6]. There is significant advancement in collecting and storing the data; therefore,making it necessary for companies to look at new solutions for data processing and analysis. Author Dorota Jelonek in her paper "Big Data Analytics in the Management of Business" illustrates how Big Data analytics has steadily becomethe effective support in company's operations; and the areas and activities where companies can attain competitive advantage with use of Big Data analytics.

In another paper "Resource management in Big data initiatives: Processes anddynamic capabilities", authors Ashley Braganza in collaboration with Laurence Brooks, Daniel Nepelski, Maged Ali and Russ Moro have focused their study around how and why effective resource management is gaining rising importance.

Review of papers

Our society today is hyper-networked, producing data at an ever-increasing rate. According to IBM research, more than 2.5 quintillion* bytes of data is generated each day; and more than 90 percent of the world's stored data was created in the last couple of years alone. Within next decade the gathered information will increase by 50 times whereas information number of technology specialists, to deal with data, will grow only by 1.5 times. So, in author's opinion, information overload is going to be one of the most severe challenges in the big data environment. As the data volume is massive, the analytics can only be possible if we have highly efficient algorithms and software. This "**volume**" is one of the four Vs that characterise Big Data, as coined by the author[3][4].

However, the challenge is not just of sheer size of data. The information overload is due to three main factors: diverse sources, increased storage capacity and improved processing techniques. This is termed as "**variety**" by the author.Today data is captured from internet, online/offline transactions, email communications, pictures, audios, videos, logs, posts, search queries, social media, science data, health records, sensors and then countless mobile applications. These data include textual content to multimedia contenton a variety of platforms [3][4].

Third 'V' coined by the Author is "**velocity**"[3][4]. With the vast volume of multifaceted and assorteddata pouring from anywhere, real-time, and from multiple of sources, there is indisputably an era of Big Data - a phenomenon also termed to as the Data Deluge. Due to its ability to handle incoming data, its rate of processing and analysing data, Big Data analytics sets itself apart and a notch higher as compared to traditional analytics methods.

Due to diversity of sources from where such disproportionately humongous data is gathered, it is very crucial to test the "**veracity"**orquality of the data [5]. Big data, being true to its name, has enabled data handling capacity to from terabytes to petabytes and further to Zettabytes. Furthermore, it pays attention to data flow, it relies more on processes and data scientists, it is moving analytics from IT function to being more core and operational function.

Dorota explains why Big Data are not just about data, but also about IT infrastructure, analytical systems and employees with high analytical skills. Traditional analytics methods are hypothesis-driven and it searches for basis to verify the hypothesis. Big data analysis, reverse-engineering this exact approach, focuses on searching for correlation and patterns. Discovery of unexpected correlation, Jelenok says, can be the stimulus to formulate hypothesis.

In Elsevier Journal of Business Management, author Uthasankar has coined the BD as process of "**datafication**". The author has mentioned that Big Data is the combined outcome of individual as well as collective intelligence generated and shared mainly through the technological environment, where almost anything can be documented, measured, and captured digitally, and in doing so, converted into data, process that can be called.

Another key difference for the Big data analytics vis-à-vis traditional analysis is ability to process continuous inflow of data. Unlike traditional methods where static pool of data is analysed, the Big data analytics is based on real-time data and thus the results are generated without delay and are accurate. The requirement to process and consume such massive collection of information and to spruce out meaningful information has made it inevitable for "Big data" to move into almost every field – be it government, defence, manufacturing, healthcare and sports. With the availability of advanced Big data technologies e.g., NoSQL Databases, BigQuery, MapReduce, Hadoop and SkyTree, insights are better accomplished to enable improved business strategies and decision-making process in critical sectors such as medical care, production, energy, and predicting natural calamities, to name a few.

Managers increasingly adopt strategies based on acquiring, processing and using high-quality data for the decision-making (data-driven decision-making approach). The manufacturing sector is one of the maximum benefitting with Big data analysis application. Big data analytics can help in early identification of quality issue, in product development. Sales-Marketing teams can use Big data analysis for supply-demand analysis, identification of right marketing mixes as well as with promotions and campaigns. To state generically, Big data analytics can prove instrumental in strategic business support for various functions within the organisation.

Although there are barriers such as availability of qualified specialists, complicated technology and unclear/undefined objectives, there are steps being taken to overcome these barriers. Universities having data science focused courses and IT companies developing effective and user-friendly solutions are few such steps. The research paper by authors Ashley Braganza and others identifies limitations of resource-based theories in Big Data initiatives.

The authors studied Big data analytics implementations across many organisations and their first key observation was that in most of these organisations the enthusiasm or interest was wearing off after that first attempt. The senior leadership, the authors thought, should realise that to justify the investment done for Big data implementation by the organisation, the analytics cycle should be run and re-run multiple times as defined process. It is only then that the true strategic insights can be drawn from Big data analytics.

Another observation by the authors was that lack of clarity in various roles necessary for big datainitiatives hampers organizations from using resources strategically. The authors on this point stress on the difference that exists in principle between Big data theory and traditional Resource based theory. So, the competitive advantage is lost when Big data is implemented using traditional approach of organisational resource management.

Three theoretical frames of reference are relevant to develop thinking about big data. These are - knowledge management (KM),resource-based theory (RBT) and dynamic capabilities (DC). These three if considered independently offer selective insights into the phenomenon of big data; however, as collectively, the three approaches provide a frame to examine big data processes, relationships and resources.

Knowledge management (KM) is firmly established in scholarly literature since the 1990s. According to Filippini, Güttel, and Nosella (2012), knowledge management initiatives are characterized by a set of methods which are formal descriptions of goals and activities, roles which is social structure, resources such as human resources, time, and infrastructure, and organizational routines that enable either exploratory learning.

Barney (1986) identifies resources that formsources of competitive advantage. He suggests strategic resources have four attributes - Value, Rarity, Imperfect limitability and Non-substitutability. The degree of heterogeneity of resources influences the potential for sustainable competitive advantage.

Teece, Pisano, and Shuen (1997) states dynamic capabilities as the firm's ability to integrate, build and reconfigure internal and

external competences to address rapidly changing environments. This paper argues big data programs need to go beyond one-off initiatives and become a dynamic capability within organizations.

II. CONCLUSION

Effective implementation of Big data solution needs three key ingredients: first, the company's strategies should be aligned with the overarching philosophy of Big data analytics. It is applicable to information strategy, resource management strategy as well as overall business strategy. Information strategy here includes hardware platform, software, application landscape of Big Data analytics and human resources as well.

Senior leaders in the organisation must ensure to build information culture in the organisation. Key part of this to assess all the information that already exists in the organisation and identify which other data should be collected and if there are any new sources of data that should be considered. It is also essential to process and use all the data that is being collated, as some of the information could be time-sensitive and its usefulness or relevance may cease after that duration.

Another very crucial point to remember is that Big data analysis is real-time and repetitive process. If not used recurrently, the organisation will fail to rip its full potential and also it will not justify the investments done for setting up Big data solution.

Quintillion = 1000^6 or 10^{18} | Trillion = 1000^7 or 10^{21}

REFERENCES

[1] Barney, J. B. (1986a). Organizational culture: Can it be a source of sustained competitive advantage? Academy of Management Review, 11(3), 656–665.

[2] Big Data Analytics in the Management of Business, by Dorota Jelonek (jelonek@zim.pcz.pl)

[3] C. Eaton, D. Deroos, T. Deutsch, G. Lapis and P.C. Zikopoulos, Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data, Mc Graw-Hill Companies, 978-0-07-179053-6, (2012)

[4] http://www.forbes.com/sites/teradata/2014/11/19/defining-big-data-in-two-words-who-cares (2017.01.22).

[5] M. Beyer, Gartner says solving 'big data' challenge involves more than just managing volumes of data. (2011)

[6] Resource management in big data initiatives: Processes and dynamic capabilities, by Ashley Braganza, Laurence Brooks, Daniel Nepelski, Maged Ali, Russ Moro

[7] S. Sagiroglu, D. Sinanc, Big data: A review. In Collaboration Technologies and Systems (CTS), 2013 International Conference on IEEE, (2013)

[8] Teece, D. J., Pisano, G., & Shuen, A. Dynamic capabilities and strategic management. Strategic Management Journal, 509–533. (1997)