Chapter 3
From Business Intelligence to Big Data:
The Power of Analytics

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ABSTRACT

Boundaries between business intelligence (BI), big data (BD), and big data analytics (BDA) are often unclear and ambiguous for companies. BD is a new research challenge; it is becoming a subject of growing importance. Notably, BD was one of the big buzzwords during the last decade. BDA can help executive managers to plan an organization's short-term and long-term goals. Furthermore, BI is considered as a kind of decision support system (DSS) that can help organizations achieving their goals, creating corporate value and improving organizational performance. This chapter provides a comprehensive view about the interrelationships between BI, BD, and BDA. Moreover, the chapter highlights the power of analytics that make them considered as one of the highly impact's organizational capability. Additionally, the chapter can help executive managers to decide the way to integrate BD initiatives as a tool, or as an industry, or as a corporate strategy transformation.

INTRODUCTION

We are in the middle of data explosion. According to Statistica (2020), the size of the digital universe in 2013 was estimated at about 50 zetabytes, it is expected to reach 175 zetabytes by 2025. The global market for software, hardware, and services for storing and analyzing big data is estimated to triple in size in the next five years (Statistica, 2020).

According to Forbes report, "The Global State of Enterprise Analytics, 2020", Cloud Computing, IoT, and Artificial Intelligence/Machine Learning will have the greatest impact on enterprises' analytics initiatives over the next five years. Across all enterprise executives globally, Big Data, 5G, and Security/Privacy concerns are predicted to have the greatest impact (Columbus, 2019). Furthermore, advanced and predictive analytics are dominating enterprises' analytics initiatives today, improved efficiency and

productivity; achieving faster for more effective decision-making; and driving better financial performance are the top three benefits enterprises which are gaining from analytics (Columbus, 2019).

Going back to the 1990s, after the information warehousing quickly vanished, the BI era took over. This era introduced a way which is not only to reorganize data, but also to transform it into much cleaner and easier to follow. In this era, BI was pushed notably by the introduction of Data Warehousing (DW) and On-Line analytical Processing (OLAP) that provide a new category of data-driven DSS. OLAP tools provide users with the way to browse and summarize data in an efficient and dynamic way (Al-noukari, Alhawasli, Alnafea, & Zamreek, 2012). According to Ram, et al. (2016), BI is focusing mainly on structured and internal data. Therefore, many of valuable information embedded in the unstructured and external data remain hidden, which leads to an incomplete view and limited insights, thus biased decision-making.

Currently, the new technologies generate huge amount of data arriving from many sources including; computers, smartphones, tablets, sensors, social media, audios, videos, IoT, clickstreams, databases transactions, and so on (Walls & Barnard, 2020; Braganza, Brooks, Nepelski, Ali, & Moro, 2017; Fosso Wamba, Gunasekaran, Akter, Ren, Ji-fan, Dubey, & Childe, 2017). Wal-Mart generates about 2.5 petabytes per hour. Fiber optic cable, the most efficient media for data transfer, can transfer up to 100 gigabits per second. Wal-Mart, simply mean, produces more data than it could transfer to any another place (Brock & Khan, 2017).

Traditional tools are unable to store, manage and analyze such hug data. This situation leads to the creation of the new big data global phenomenon. In 1997, Michael Cox and David Ellsworth first used the word "Big Data" to explain data visualization and the challenges which would pose to computer systems (Wang, Kung and Byrd, 2018). BD moves away from traditional data management onto new methods focusing on data discovery, data integration and data exploitation within the context of "big" data. The word "big" does not only imply size, but rather the ability to produce insights, and manage complex types (Wang, Kung and Byrd, 2018). This leads to the adoption of famous BD three V's (Volume, Velocity, and Variety). The evolution of BD took place during the period from 2001 to 2008 when new tools and technologies were able to manage immense amount of data. 2009 was the year of the BD revolution where it was able to handle and manage unstructured data, in addition to the move from static environments into cloud-based environments (Wang, Kung and Byrd, 2018).

Another important challenge, BD technologies have to process BD in real-time (streaming processing). For example, the large hadrons collider (LHC) generates more raw data than the CERN computing grid can store; thus data has to be instantly analyzed, hence necessities the parallel and distributed computing (Brock & Khan, 2017).

Thus, in the light of this, the main goal of this study is to analyze recent literature of BD, and to find the relationship between BI, BD and BDA. Moreover, the study highlights the power of analytics that make them considered as one of the highly impact's organizational capability.

To achieve this goal, a conceptual literature review was adopted to find all the studies that relate BI with BD. Then, an analysis phase was required to find the interrelationship between both domains. Finally, the study helps managers to decide the way to adopt BD initiatives.

The remainder of this paper is organized as follows. The next section looks at the fundamentals of BI, BD, and BDA. Then a section discussing in details the relationships between BI, BD, and BDA. Thereafter, a section discusses big data analytics capability, and highlights the power of analysis in the current era. Then, the paper provides an overview about the current trends in BD initiatives adoption,

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