POTENTIAL OF BIG DATA FOR MARKETING: A LITERATURE REVIEW

Abderahman REJEB
Doctoral School of Regional Sciences and Business Administration, Széchenyi István University 9026 Gyor, Hungary
abderrahmen.rejeb@gmail.com

Karim REJEB
Higher Institute of Computer Science El Manar, 2, Rue Abou Raïhan El Bayrouni - 2080 Ariana, Tunisia
karimrejeb1515@gmail.com

John G. KEOGH
Henley Business School, University of Reading, Greenlands, Henley-on-Thames, RG9 3AU, UK
john@shantalla.org

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Abstract
Today, data generation is exploding, and the function of marketing is becoming more sophisticated and personalized. Companies seek to gain a deeper understanding of their internal corporate environment, externalities and enhance their marketing power exponentially. Customer service is at the heart of a business's concern and has been a critical driver to leverage big data in marketing. The increasing pace of data generation has made it challenging to capture data from various sources and extract valuable business insights. Companies have taken advantage of the capabilities of big data to develop an in-depth knowledge base of their customers and increase the effectiveness of their decision-making processes. Moreover, they seek to achieve a distinct competitive advantage, deliver highly customized products or services, and stimulate innovation. Despite the increasing importance of big data in business, research investigating the potential of technology for marketing is scarce, and little attention has been paid to the role of big data in marketing activities. Therefore, the primary goal of this paper is to fill this knowledge gap and to provide a timely review that captures the dynamic nature of this field. Selected papers (n=40) were thoroughly analysed, and the potential of big data was classified in four main research themes; comprehension, competitiveness, customization, and creativity. The aim of the review is to answer the following research question: "What are the perceived benefits of big data adoption in business marketing activities?"
Keywords: Big Data, Marketing, Comprehension, Competitiveness, Customization, Creativity.

1. INTRODUCTION

In an era defined by fierce competitive pressures, the cost of customer acquisition is increasing. Moreover, understanding and management of the customer relationships lifecycle and retention practices have become more challenging than ever before (Gupta et al., 2006). As supply chains become more complex and interlinked, the search for greater efficiency in production processes and the need to establish strong customer relationships have led businesses to adopt modern technologies to sustain their competitive position in the market (Moradlou & Backhouse, 2014). In this regard, a growing stream of literature has articulated the significant impact of big data (BD) and how BD is reshaping the business landscape (Akter & Wamba, 2016; Chen, Chiang, & Storey, 2012). Similarly, the role of big data in supporting the decision-making process and improving the various organizational functions from marketing to the supply chain has been increasingly recognized (Waller & Fawcett, 2013). BD is a term that primarily denotes vast data sets (terabytes to exabytes). Data is generally unstructured, complex in nature and encompasses a wide variety of sources and requires sophisticated technologies to capture, store, process, analyse, and visualize (Chen et al., 2012). Today, BD is a common and trendy technology term and practice that could help companies gain actionable insights and create a competitive advantage in the rapidly dynamic and turbulent business environment (Salehan & Kim,

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2016). BD is not just a technical concept, it is emerging as a critical construct for the successful transition to Industry 4.0 (Lee & Cho, 2019). Initially introduced in Germany, Industry 4.0 represents a paradigm shift in production operations and a manifestation of the manufacturing automation for which BD could be a significant contributor. Much of the high expectations presented by BD include the ability to generate valuable insights from the collection of new types and volumes of data in innovative ways that would not have been feasible and economically viable with conventional computational models. The output of text analytics in the form of fine-grained and precise knowledge benefits organizations and enables the development of new products and services (Davenport, 2012). BD is harnessed to strengthen communicative practices such as the exchanging of ideas among supply chain partners, investigation of market-based problems, and the characterization of market size and competitors (Tan & Zhan, 2017). Previous studies (cf., (Bharadwaj & Noble, 2015; Demil & Lecocq, 2015) note that BD offers several new opportunities for businesses with the aim to reach new market segments and develop business model innovation. Moreover, the role of BD in facilitating the provision of better and more precise forecasting is already recognized by data scientists and scholars. For example, retailers can use advanced BD analytical tools to collect massive data sets related to product sales and update (and simulate) their demand and manufacturing forecasts for the forthcoming periods, eventually improving the retail and manufacturing business performance (Shen, Choi, & Chan, 2019). As a result, the predictive capabilities of BD allow businesses to make well-informed decisions, improve supply chain operations, and strengthen brand attachment.

Although the academic literature on BD in marketing is continuously growing, we could not locate studies synthesizing the literature on the broad possibilities of BD in the marketing function. In particular, there is a lack of research presenting evidence as to the value of BD supporting the marketing function in an organization (Pantano, Giglio, & Dennis, 2019). Most BD projects are still being developed for future implementation or they are in a nascent stage of development. Our primary goal in this research paper is to explore how BD could potentially impact marketing. Consequently, our pressing research question is "What is the potential of BD in marketing?" Through the analysis of the existing literature on the BD-related changes in marketing, we strive to demonstrate how the adoption of BD will reshape marketing in the near future. In posing this question, we expect to obtain an in-depth understanding of the following research question:

What are the perceived benefits of BD adoption in business marketing activities?

This research work contributes to the body of knowledge in different ways. To the authors' best knowledge, this review is among the first to address the transformational role of BD in marketing and to systematize the recent investigations on this topic from the literature in leading journals. Moreover, the systematic review of literature provides a timely summary of current evidence that can be used to inform marketers and decision-makers in designing marketing business models based on the emerging role of BD. In this article, we argue that the marketing science is changing at a systematic, predictable and irrevocable pace (Rust & Huang, 2014). Therefore, it is necessary to consider BD solutions in understanding the dynamism of supply chain environments, coping with the evolution of the marketing function, and living up to customers' expectations.

The paper is organized as follows; section 2 describes the methodology of the systematic literature review. The following section presents the descriptive findings from the review. Section 4 provides a detailed discussion on the potential of BD in marketing based on the findings of the reviewed literature. Section 5 concludes the review and outlines the research contributions and research limitations.

2. METHODOLOGY

2.1. Research protocol development

To address the research question, we conducted a systematic review of the literature following the rules proposed by Denyer & Tranfield (2009). A systematic literature review (SLR) is driven by a list of specific steps that ensure the relevance of publications on a particular topic and the minimization of research bias and errors. The process of the SLR followed in this study aims to identify the relevant literature related to BD applications in marketing and select and synthesize the themes with respect to the research question in a transparent, complete and rigorous manner. Furthermore, the authors followed a review procedure that is based on an

iterative cycle of identifying adequate search keywords, surveying the relevant studies, and carrying out the analysis in the last stage. A review protocol has been created to lay out the entire procedure from the execution of the protocol to the data collection and retrieval of final articles to be analysed and reviewed. Table 1 describes in detail the selection of the search database, the collection of publications, and the filtering criteria.

TABLE 1 - RESEARCH PROTOCOL

Research protocol	Details description
Research online database	Searches were conducted in Web of Science (WoS), which is a leading international citation database with multidisciplinary coverage of over 10000 high-impact journals in the sciences, social sciences, art and humanities (Caulfield, Rachul, & Zarzeczny, 2012).
Publication types	Only academic peer-reviewed literature was considered. The search was limited to journal articles to ensure that the research originated from academic sources.
Language	Only publications in English were considered.
Date range	No specific date range was used to conduct the research
Search fields	Title, abstracts and keywords
Search keywords	TS= ("Big data" AND (Marketing OR Advertising OR Advertise* OR Marketer*))
Inclusion criteria	Only publications that studied BD applications in the field of marketing were selected.
Exclusion criteria	Publications with a deep and pure technical focus were excluded. Studies on BD applications beyond business and marketing were filtered out.

2.1. Data collection

Based on the surveyed Web of Science database, the initial search queries resulted in a total number of 252 publications. To further refine the results, the authors eliminated duplicates and articles with missing metadata (e.g., abstract). Articles should be accessible to the authors on the date of the search task. The number of articles decreased to 240 publications. The publications were analysed and filtered according to the inclusion and exclusion criteria mentioned in Table 1. In other words, two reviewers closely examined all 240 papers using a four-eye-principle. The authors agreed to include all publications that discussed the potential of BD in marketing. As a result, the 240 publications were filtered by content, and whether their titles, abstracts, and keywords were relevant to BD applications in marketing. The number of papers that successfully passed the first screening was 60. The significant decrease in the total number of studies is attributed to the presence of several articles discussing BD in different fields such as computer sciences, healthcare, and tourism without explicitly mentioning its implications in marketing. After the full-text reading, 40 publications aligned with the objective of this study and hence were retrieved for the final analysis. These studies are relevant and they present the potential of BD adoption in marketing. Figure 1 shows in detail the process of data collection.

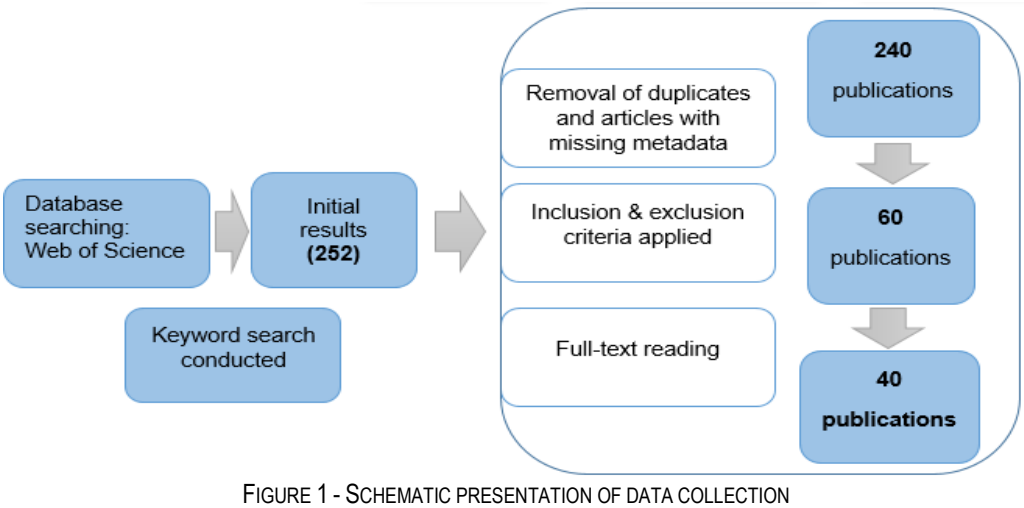

FIGURE 1 - SCHEMATIC PRESENTATION OF DATA COLLECTION

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3. FINDINGS

3.1. Publications by year, country, journal

3.1.1. Publications by year

The search was conducted on the 17th of September 2019. Figure 2 presents the number of publications published by year and extracted from the execution of the research protocol. Although BD is not a new concept or idea, papers studying its potential in marketing were almost all published in the last few years. There is a steep upward trend regarding the papers published in the field of BD. As shown in figure 2, there is an upward trend observed from the year 2014 to 2018. However, the number of papers published from 2014 onward has increased significantly. This era corresponds to the emergence of Industry 4.0 technologies, and more specifically coincides with the "Industry 4.0 standardization roadmap" launched in Germany in 2014. Industry 4.0 is a comprehensive term for technologies and sophisticated tools that support the development of smart factories. As a result, BD is a major contributor and enabler in the era of Industry 4.0, which is characterized by ubiquitous data generation and exchange. 34 out of the 40 total papers were published in the years 2014-2018, which reflects the growing scholarly interest level in BD since 2014.

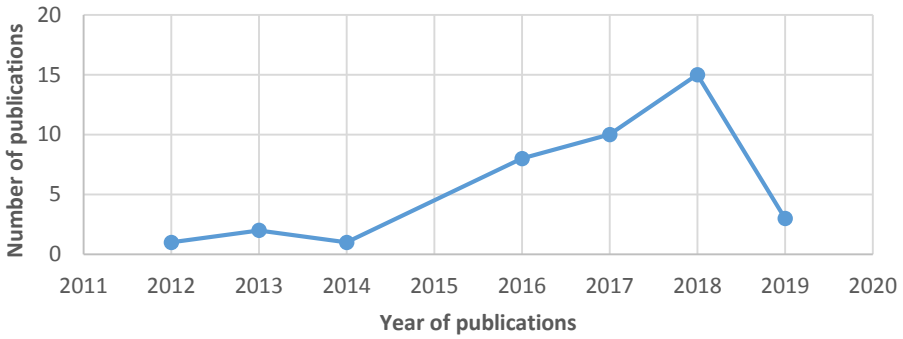

FIGURE 2 - PUBLICATION DETAILS ACCORDING TO YEAR

3.1.2. Publications by country

The authors' affiliations to different countries were extracted. It was observed that a significant contribution to the BD literature in the context of marketing came from the United Kingdom (UK) and the United States of America (USA), with 13 papers each or 26 out of the 40 selected papers. The result is predictable for the US where BD has been considered as a key driver in the next wave of economic innovation and an enabler for a wide variety of sectors. For example, Szlezák et al. (2014) referenced Mckinsey research that suggests that the application of BD in the US healthcare sector could reduce costs by $300 billion a year. Related to marketing, Hofacker, Malthouse, & Sultan (2016) cited a US survey of senior marketers by Emarketer in 2013 which reported that "58% US agency and brand executives said that BD had yielded more than half of marketing initiatives when it came to increasing insights into consumer behaviour". Likewise, the UK government was supportive of BD projects allocating a cumulative new expenditure of GBP 73 million for BD research and development from 2014 to 2017 and estimated that this could create 58,000 new jobs in the country in that period (Moorthy et al., 2015). Further, in the UK, the Economic and Social Research Council's Big Data Network is investing in innovative projects to develop new methods and tools for capturing, managing, and exploiting massive volumes of information (Chen & Yu, 2018). BD also has considerable value in Australia as there have been several strategies to manage BD by big companies such as Vodafone Mobile and News Corporation (Liu et al., 2015). As illustrated in figure 3, Australia and Taiwan are next on the list with contributions of four and three papers respectively. Countries with two relevant publications were namely, China, France, India, Italy and UAE.

According to the analysis of publications based on the continent of origin, European researchers were the most productive accounting for 52.5% of the total contribution. To a lesser extent, relevant contributions for both Asia

and North America represented 40% and 32.5% respectively. Scholars from Oceania were responsible for 10% of the contributions studying the potential of BD in marketing. No studies were located from African or South American academic institutions which may emphasize the digital gap that exists between developed and developing countries.

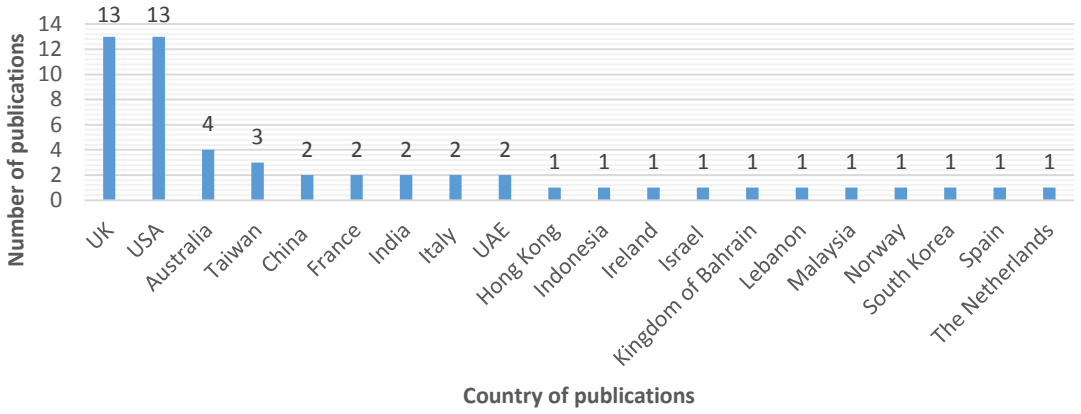

FIGURE 3 - PUBLICATION DETAILS ACCORDING TO COUNTRY

3.1.3. PUBLICATIONS BY JOURNAL

The selected papers were published in a wide variety of academic journals. Table 2 provides the number of articles according to the journals and their respective impact factors (the 2018 edition of the Journal of Citation Report- JCR).

TABLE 2 - JOURNAL AND NUMBER OF PAPERS PUBLISHED

Journals	Number of articles	Impact factor (2018)
Journal of Business Research	3	4.028
Technological Forecasting & Social Change	3	3.815
Business Process Management Journal	3	1.88
Journal of Service Research	2	4.071
Marketing Science	2	2.49
International Journal of Market Research	2	0.726
Tourism Management	1	6.012
International Journal of Physical Distribution & Logistics Management	1	5.212
California Management Review	1	5
Industrial Marketing Management	1	4.779
Journal of Knowledge Management	1	4.604
Journal of Product Innovation Management	1	3.781
Journal of Retailing	1	3.671
International Marketing Review	1	3.447
Strategic Organization	1	3.109
Journal of Management Information Systems	1	3.013
R & D Management	1	2.354
International Journal of Retail & Distribution Management	1	2.321
International Journal of Advertising	1	2.234
Journal of Research in Interactive Marketing	1	2.156
Journal of Business & Industrial Marketing	1	1.961
European Journal of Innovation Management	1	1.793
European Journal of Marketing	1	1.716
Others	8	0

The articles were published in 30 different journals. In summary, 9 out of 40 articles were published in the Journal of Business Research, Technological Forecasting & Social Change, and the Business Process Management Journal. In addition, the journals that only published two relevant papers were the Journal of Service Research, Marketing Science, the International Journal of Market Research, and the Brazilian Journal of Marketing (which is included in the category 'Others' on the list). The remaining journals on the list published one paper about BD and its connection to marketing. The category "Others" summarizes 7 journals that have no impact factor. It should be stated that the majority of papers were published in leading academic journals with high impact factors (see Table 2). This fact alone increases the utility of this study and makes the findings of this review valuable to researchers. The content of the 30 journals covers different areas such as business research, management, marketing, information technology, and supply chain management. Marketing and business journals dominate the list suggesting that BD technology attracts great interest in these areas because of its possibilities to sustain marketing activities and add more business value to companies.

3.2. Big data and marketing papers based on the type of research

Figure 4 shows the distribution of the 40 selected papers by methodology. Four consolidated research methodologies were considered for classification: conceptual, empirical, mixed methods and multi-methods. Empirical studies focus on visible or quantitative aspects of BD especially for marketing analytical purposes through a variety of methodological approaches such as analytics and surveys. Papers with a conceptual nature propose frameworks based on BD and discuss as well as review the possibilities of BD in supporting business activities in general and marketing in particular. In some instances, these studies explore the applications of BD, the drivers, and the antecedents of BD adoption. It can be observed from Figure 4 that this category of research approach represents 15 out of the 40 selected studies. Six of the studies adopted a mixed-methods approach for the evaluation of BD's business utility in marketing. The mixed research designs combined quantitative and qualitative methods of investigation such as the development of conceptual frameworks and the use of analytics or surveys to outline the predictive capabilities of BD (e.g., in retailing activities) (see (Bradlow et al., 2017)) or to measure the perceptual constructs associated with many aspects of customer relationships with firms and evaluate how they impact future behaviour (Kitchens et al., 2018). Two papers employed a multi-methods research approach, which consists of the triangulation of different methods such as the complementing of frameworks with interviews or case studies. The remaining 47.5% of the papers dealt with the topic using empirical research that include case research (17.5%), analytics (10%), surveys (10%), and models (2.5%).

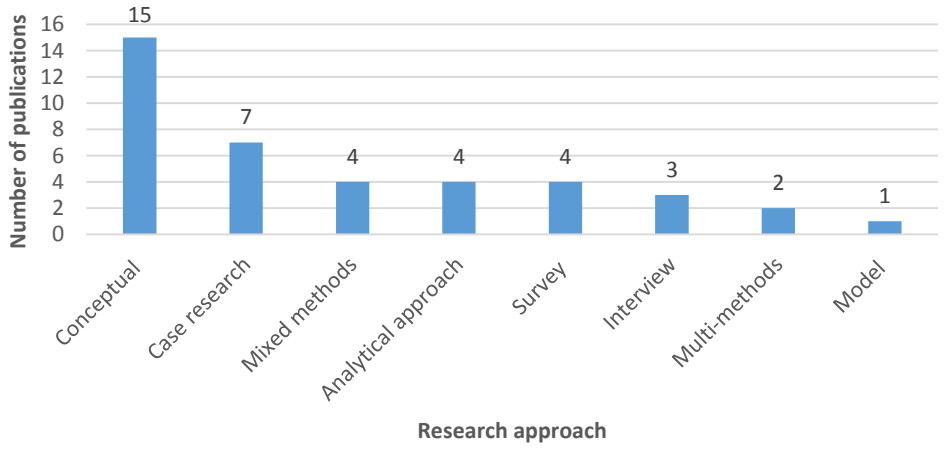

FIGURE 4 - DISTRIBUTION BASED ON THE TYPE OF RESEARCH

Figure 5 shows the trend of how different research methods have been used to study BD in marketing during the period of 2012-2019. The trend observed in figure 5 reveals that there is a steep upward trend in the conceptual papers on different aspects of BD. The trend indicates that the concepts and the theoretical inferences concerning BD potential in marketing are being tested and validated through empirical methodologies using case studies, mixed methods, analytics, surveys, and interviews. The dominant research

technique throughout recent years is that of conceptual studies. The increase in studies using empirical, mixed, and multi-methods is not significant. Most studies adopting an empirical approach are required to conduct further investigations on the impact of BD on marketing.

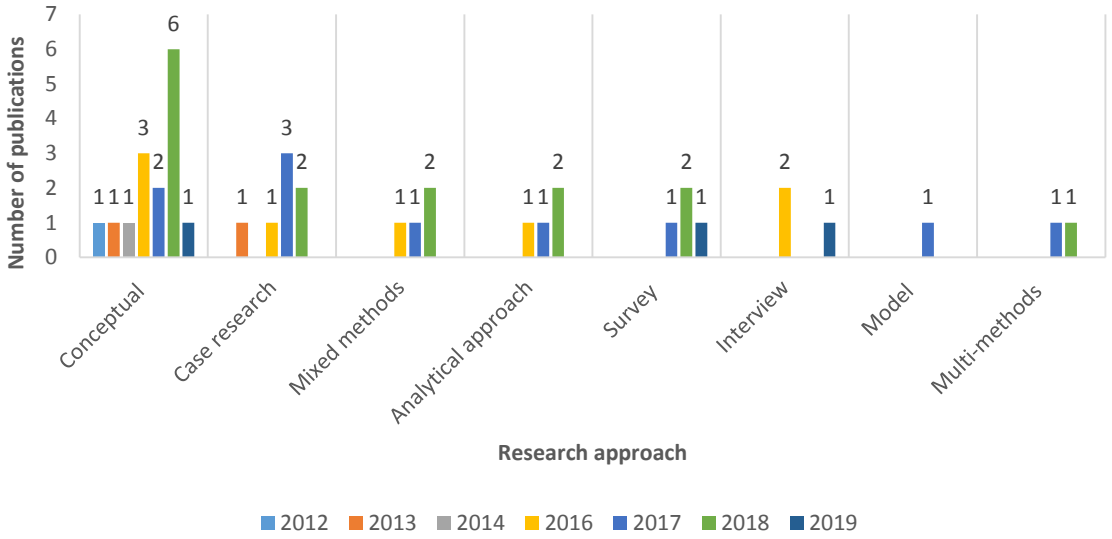

FIGURE 5 - DISTRIBUTION OF RESEARCH APPROACHES

4. REVIEW DISCUSSION

4.1. Improving comprehension

Where management and customer-related decisions tend to be knowledge-based, BD is a vital tool for generating knowledge and supporting decision making (Tan & Zhan, 2017). According to Mawed & Aal-Hajj (2017), BD is not a large storage of massive data sets. Instead, it is more concerned with the ability to access, analyse and leverage the information in real-time to deliver real-world intelligence and business benefits. Firms employ BD techniques to trace the flow of information, analyse large volumes of data, tailor their responses according to specific, unique and customized knowledge rapidly, and exchange data and information with customers and other stakeholders (Xu, Frankwick, & Ramirez, 2016). BD allows businesses to consolidate and collect many forms of data resources with different structures and from complex distributed systems. Usually, the data are purified and filtered with advanced, highly sophisticated, and computationally intensive customer analytics and are turned into customer insights useful for marketing and service decisions. The marketing team can benefit from the BD environment to ensure efficient and effective communication and knowledge sharing (Tan & Zhan, 2017). For example, Liu, Singh, & Srinivasan (2016) argue that BD can produce meaningful business marketing insights and timely representation of consumer intentions if the technology is properly applied to the processing of data streamed from online social platforms. Moreover, BD improves the understanding of data-driven marketing and provides managers with dynamic learning capabilities to support marketing strategy-making processes and defend the brand from emerging risks (Johnson et al., 2019). BD is not only about the generation of data, but it also considers other equally essential variables such as time and location of data, allowing more realistic analyses and real-time marketing tactical decisions. For instance, several IT companies are continuously providing services associated with big data analytics (BDA) and intelligent techniques to support firms in the extraction of valuable consumers' insights for supporting management and marketing-related decisions (e.g., Google Cloud and Microsoft Azure, from Google and Microsoft respectively) (Pantano et al., 2019).

Firms can use BD to understand environmental information, reduce uncertainty, and make well-informed decisions (Rust & Huang, 2014). Zeng & Glaister (2018) noted that companies equipped with the insights generated by BD could be more agile, flexible, and highly responsive to business needs and unexpected opportunities. The ability to extract insights out of data is useful for discovering many spurious patterns (Rust

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& Huang, 2014). BD text analytics tools offer the opportunity to identify critical patterns and other non-trivial information and knowledge from large sets of both structured and unstructured data that may be otherwise difficult to observe. Zhan et al., (2017) argue that BDA can help firms to instantly gather consumers' feedback, track changes in customer behaviour, and communicate this information to the team responsible for product development. The knowledge that is generated through the BD process could serve businesses in the planning, design and improvement of their marketing initiatives. Similarly, companies can gain additional information and learn more about their competitors' key product attributes, pricing policies, and customer feedback (Xu et al., 2016). The visualization capabilities of BD allow firms to optimize their pricing decisions based on their customers' spending behaviour (Xu et al., 2016), create new forms of value, and understand the potential risks and how to mitigate them (Mawed & Aal-Hajj, 2017). The ability to triangulate data sets in real-time is facilitated by the application of BD techniques such as web analytics, customer analytics, search engine crawlers, and search analytics that enables marketers to obtain cohesive sets of automated knowledge concerning the behavioural traits of their consumers. Most BDA systems provide descriptive and predictive information allowing businesses to quickly discover distinct patterns that are extremely helpful for decision making. The primary task of these techniques is to eliminate unimportant and irrelevant data so that actionable insights can be derived (Erevelles, Fukawa, & Swayne, 2016). That said, BD can capture hidden knowledge, generate new understandings, and create more adaptive capabilities than firms with little awareness and information needs (Khan & Vorley, 2017). To substantiate this development a study by Talón-Ballestero et al. (2018) shows that BD techniques could improve the knowledge of hotel managers regarding their customers' satisfaction, loyalty, and revisit intentions. Therefore, BD enables firms to gain increased comprehension abilities to understand the dynamics of the environment, to sense potential marketing opportunities and threats (Cao, Duan, & El Banna, 2019), and to attain business excellence (Gnizy, 2019).

4.2. Improving competitiveness

In searching for a technology-based competitive advantage, the adoption of BD enables companies to create and capture value (Zeng & Glaister, 2018). The leveraging of BDA can deliver a competitive advantage that spans across the entire supply chain decision spectrum, from the development of personalized location-based marketing services to the optimization of supply chain inventories to the consistency and accuracy of supplier risk assessment (Sanders, 2016). As such, BD provides businesses with the ability to improve decision making, enhance processes and improve products by extracting value insights from data (Kitchens et al., 2018). The leveraging of consumers' reviews is useful for businesses to obtain in-depth knowledge about their customer segments and their perception regarding the quality of products and services. BD capabilities include the generation of new business models in which users access the service for free while providing a revenue-generating data stream (Trabucchi & Buganza, 2019). This approach helps the firm to establish strong customer relationships and strengthen the value-added capability of marketing since the customers are considered a valuable source of meaningful data.

The embeddedness and participation of customers in the BD-enabled business process presents many opportunities for marketers. For instance, firms attaining a consolidated view of their customers in the BD scenario can improve their forecasting and expand their ability to address several risks associated with decision making (Richey et al., 2016). For example, BD can significantly enhance and produce accurate forecasting of sales or consumption in marketing, resulting in a better allocation of the marketing budget and practical design of overall marketing strategies (X. Liu et al., 2016). BD provides marketers with the possibility to track the purchasing patterns or trending topics in the marketplace (Fernando, Chidambaram, & Wahyuni-TD, 2018), evaluate an expanded set of projections, and make informed decisions based on more precise demand information (Richey et al., 2016). In the hospitality industry, for instance, successful attempts have been reported from the utility of BD in tourism forecasting and predicting the visits of tourists to a particular destination (Song & Liu, 2017). In addition, BD enables businesses to stay competitive by offering dynamic pricing, competitive choices, and better campaign management based on the customer's historical spending and preferences. The application of the technology for price optimization will move to a new level where analysis will be performed at a high granularity of data based on pricing and sales (Sanders, 2016). As a result, firms can reach new market segments, perform price testing and better understand their customers' needs and wants.

BD is also considered as a cost differentiator. Richey et al., (2016) pointed out that the intuitiveness of BD can sustain the proper implementation and the operational efficiency of just-in-time systems, driving down the overall costs of the supply chain and optimizing the inventory levels across the involved businesses. Big data improves organizational performance, lowers the costs of business processes and provides firms with adequate benchmarks for controlling environmental costs and evaluating the correct optimal product selling sequence (Shen et al., 2019). Xu, Frankwick, & Ramirez (2016) pointed out that BD can facilitate the performance and the costs of monitoring competitors, observing consumers, searching the Internet, delivering low-cost surveys, testing prototypes, and acquiring feedback. Moreover, the wealth of insights and real-time information that BD offers enable companies to manage their production operations intelligently, understand and respond to customer needs, improve response times, and boost revenues and profits (Harrison-Walker & Neeley, 2004). American Eagle Outfitter is an example of how companies can use BDA to support competitive priorities such as optimizing customer service while effectively controlling costs (Sanders, 2016). The value-driven insights and decisions of BD allow firms to differentiate themselves and deliver superior customer value. Of note, BD can enhance the firm's ability to rapidly identify and quickly respond to threats of product diversion and product imitation through actionable market insights. Furthermore, firms can increase their distinctive competence in business operations and sustain their competitive advantage (Zeng & Glaister, 2018). Therefore, the customer-centred perspective emphasized by the application of BD to marketing constitutes a critical success factor for developing competitive market offerings, minimizing transaction costs and uncertainty, delivering higher value than one's rivals. These benefits aid in forging deeper customer relationships, improving profitability, and excelling in the global marketplace.

4.3. Driving customization

Since customer self-service and product customization are potential sources of customer data, the capabilities of BD and business analytics make product or service personalization possible and easier (Huang & Rust, 2013). The planning of strategic marketing goals and the design of personalized products and contextual communications start from the deep understanding of customers on a more personal basis. Firms can extract real-time information regarding their customers' perceptions, product evaluations and recommendations (Xu et al., 2016). Similarly, BD supports firms in dynamically managing this information in customer-firm relationships and ensuring dynamic and real-time service personalization (Motamarri, Akter, & Yanamandram, 2017). The customized knowledge gained from the application of BD can be used to track data on the behaviour of individual customers. When this data is combined with traditional market research, it can be extrapolated to represent micro-segments of the market and aid the creation of highly targetable audiences for personalized pricing and advertising (Sanders, 2016). Richey et al. (2016) noted that BD applications improve the capability of the firm to access customer needs and perspective, increase performance and ultimately enhance customer service. Moreover, a firm using BD to capture real-time consumer insights can improve their understanding of any unmet consumer needs. Firms can then transform these insights into actions, improve the effectiveness of digital advertising while enhancing the dynamic capability of the organization (Erevelles et al., 2016). BD offers retailers the possibility to deploy marketing efforts through targeted marketing interventions and to achieve higher returns on marketing investments (Bradlow et al., 2017).

The use of rich information in the development of customized products can enhance customer loyalty because the supply of personalized offerings responds to customers' needs in terms of responsiveness and cost-effectiveness. BD engages potential customers in a new marketing model where communications and purchases with the firm, with competitors, and with other customers are captured by the company and can be leveraged to tailor services to different individual customer needs (Rust & Huang, 2014). The embedding of BD in personalized marketing sets the conditions for customers to experience an increased control over the process and a high sense of satisfaction and initiative. The interactive approach enabled by BD can generate more customer value, drive more agility, and encourage the creation of flexible product design and manufacturing processes. BD facilitates the transfer of information from customers to manufacturers for the purpose of assessing target markets and introducing new products at an optimal level of personalization (Rust & Huang, 2014). For example, Pantano, Giglio, & Dennis (2019) found that BD with an emphasis on sentiment analysis can be a useful tool for marketers to achieve systematic knowledge of consumers and design successful marketing campaigns. The BD-induced customization can result in enormous cost advantages

because the technology creates ideal situations for achieving individualized manufacturing, and consequently, the firm would be able to identify and focus on their core competencies (Tan & Zhan, 2017). The capability of the firm to gain a holistic view of customers (Zeng & Glaister, 2018) will ensure that the final product precisely matches the requirements of target customers. BD results in the rise of well-focused companies that concentrate on the delivery of personalized products and marketing content and improve their capital performance by spending a sufficient amount on customization strategies.

4.4. Spurring creativity and innovation

In the BD era, knowledge is rapidly extracted from data and can be quickly diffused. This is primarily enabled by the reduction of costs for BDA systems acquisition and the ability to rapidly share knowledge and insights on the Internet (Xu et al., 2016). The criticality of these BD analytics and the creativity of the marketing function has been outlined in the literature (Johnson et al., 2019).

In order to accelerate the innovation process and spur creativity, firms use BD to generate new sources of ideas for the development of products, customer service, retail shelf location, distribution, and dynamic pricing (Erevelles et al., 2016). The utilization of BDA systems creates an environment where innovation is easier to simulate, nurture, implement and adapt. The higher the firm's capability to cultivate learning and experiment with BD, the higher the possibility that the firm will maximize its value creation (Zeng & Glaister, 2018). In this regard, Fernando, Chidambaram, & Wahyuni-TD (2018) found that there are significantly positive associations between BDA, service supply chain innovation capabilities and service supply chain performance. Zhan et al. (2017) suggest that BD could facilitate the product innovation process by reducing the time to market, increasing customers' satisfaction, and lowering costs. BD improves the capability of information acquisition and supports organizations to utilize knowledge to drive new product innovation from ideation through to market launch (Zhan et al., 2017). Quality insights derived from BD can, according to Wamba, Akter, & Bourmont (2019), impact the firm's performance by increasing supply chain efficiencies, hastening the development of new products, creating ingenious apps, and maintaining strong customer relationships. Not only can BD facilitate the improved utilization of existing assets, it strengthens the ability to innovate (Trabucchi & Buganza, 2019).

BD promotes a culture that is based on data-enabled insights that drives innovation in products, services, processes, platforms and business models (Chandy, Hassan, & Mukherji, 2017). For example, the use of marketing analytics could lead to better product development and entirely new business models (Cao et al., 2019). Unlike the results of market surveys, BD drastically increases the speed of innovation and provides real-time acquisition of market information. Firms embracing BD are very likely to develop an innovative mindset and creative thinking, which are imperative for building adaptive capabilities and broadening the scope and value of marketing activities (Erevelles et al., 2016). Interventions can be extracted from BDA and used as a transformative force that facilitates and accelerates the new product innovation process. In a BD scenario, it is unnecessary to collect customer feedback via formal questionnaire, rather, new product innovation may liberate new business models in which the firm can rely on mobile devices, social media platforms (e.g., YouTube, Facebook, and Twitter), and the Internet in order to create customer connections and receive immediate feedback at a reduced cost (Zhan et al., 2017).

The availability of BD makes firms use their knowledge in a creative manner to introduce new offerings or significantly improve existing products in terms of attributes or intended use. Through the use of BD, firms can speed up the process of transforming data into actionable insights that may result in radical innovations (Erevelles et al., 2016). The creativity associated with BD marketing models fosters the demand-driven strategies of the firm and enables manufacturers to focus on product innovation. Moreover, it aids in building closer links to suppliers and customers in the early stages of a product life cycle and can help to synchronize product development with channel marketing efforts that aim at enhancing customer loyalty and brand differentiation. The product innovation enabled by BD strengthens the ability of the firm to engage in greening business strategies, reduce environmental costs, and create eco-efficient products or services. For example, El-Kassar & Singh (2019) found that BD and predictive analytics can have an indirect impact on competitive advantage through green innovative practices. The BD information acquisition model can facilitate product innovation, establish better innovation processes, and quickly identify the market acceptance of new products,

customers' needs, and competitors' market reactions. In the BD environment, innovative firms could create and master value propositions that more effectively benefit from market opportunities and more closely fulfil customer requirements (Harrison, & Risher, 2018). Therefore, BD can uncover innovative opportunities in critical processes of the company in terms of functions and roles (Mawed & Aal-Hajj, 2017).

Figure 6 presents the 4Cs framework that represents the capabilities of BD in supporting marketing through improving the comprehension of the corporate environment, enhancing competitiveness, supporting product customization, and stimulating creativity and innovation.

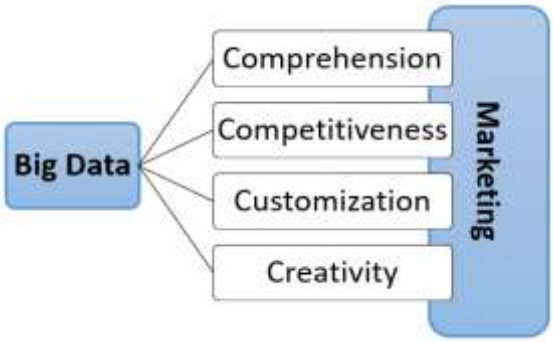

FIGURE 6 - THE 4CS FRAMEWORK OF BD POTENTIAL IN MARKETING

5. CONCLUSIONS

This study aimed to investigate the current state of research on the topic of BD and its potential in marketing by performing an SLR on selected publications. Forty (40) publications were thoroughly analysed for this purpose. The result of this SLR indicates that BD is a promising technology for marketing and still an emerging area with an increased number of publications over the last few years. Initially, the SLR focused on the research approaches adopted in the retrieved studies. The use of conceptual approaches dominates the current discussions on BD in the context of marketing, aiming for a deeper understanding of BD concepts and theories. The use of empirical methods such as case studies, analytics, and surveys sought to demonstrate, test, and validate the effectiveness of BD systems in improving the capabilities of the firm. The potential of BD for marketing identified from the SLR was categorized into the 4Cs framework. The growing literature on the applications of BD suggests that it will aid firms in building long-term competitiveness, offer more customized products and harness creativity and innovation. The majority of publications focused on the ability of BD to transform data into actionable insights that are useful for predictive analyses and decision-making procedures. Utilizing BD creates new opportunities such as the generation of new revenue streams, the involvement of customers in product and service innovation and the reduction of transaction costs. The transition towards mass customization enabled by BD can increase customer satisfaction and enhance brand loyalty. BD supports marketers in designing personalized products and delivering truly relevant and customized offerings. BD promotes a culture of creativity and innovation. The insights gained by the company accelerate the product innovation process, facilitate adaptation and boost new business models and strategies.

Our research is not without limitations. The selection of the Web of Science search database might neglect articles that might be valuable and relevant to the scope of this study. Therefore, review studies in the future may consider the review of publications indexed in other accessible and comprehensive databases such as Scopus or Google Scholar. The findings of this study are limited to the handful of selected publications; therefore the theoretical inferences discussed here should be validated with other methodological approaches such as expert interviews and empirical research.

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