Big Data Aspects and Business Decision Making

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Abstract

Today, the need to digest and utilize the information coming from different sources is growing massively due to high rate of digitization. Data has become a critical part of understanding customers and their motivation since this can easily be gathered from various online sources. The decision-making process is marked by several elements, but all revolve around customers' behaviors. In making an effective strategic decision the managers are required to have critical abilities to lead their organization in the progressively volatile and to face the competitive business world. This means that managers must gather relevant information, identify the available alternatives, choose the favoring alternative act, and continuously review the decision. Given the various sources, nature, and speed at which the data flows into the organizations, there is a need for every organization to see how they can derive value from the existing volumes of data. The main objective of this paper was to identify through empirical review the role of big data in decision-making. Based on the existing literature, big data significantly influence business decision-making. The paper found that decision-making is becoming more transparent, accurate, efficient, and faster with the application of big data. The study also established that big data aspects including data variety, volume, and velocity were critical in determining informed business decision-making. The paper concludes that big data can create new possibilities and immense opportunities for businesses to manage knowledge effectively. The paper recommends that organizations should optimize business analytics to make informed decisions that are more transparent, accurate, efficient, and faster. The paper also recommends that for organizations to reap the maximum benefits from business analytics technologies, they need to invest in the right big data analytics tools and empower their personnel to use the tools and act according to the insights gained.

Keywords: *Big data, Business Decision Making, Decision Support, Decision Quality, Automation*

1.0 Introduction

The quality of decision-making processes is becoming a crucial component of management for businesses operating in a volatile environment. Kocielniak and Puto (2015) argue that information support for decision-making processes at all levels of the company, as well as how they are organized, is becoming increasingly critical. Big Data entails not only data collection but also data processing and visualization, all of which are critical for achieving corporate goals. The use of Big Data in modern business helps businesses to gain a significant competitive advantage, and research institutions to improve the effectiveness of their investigations. Big Data has a lot of hype, and it's expected that gathering data from many

sources (devices, the Internet) will become commonplace for practically every business, regardless of size, very soon (Poleto et al., 2015).

Individual enterprises will be able to take faster and more appropriate decisions as a result of the proper use of the potential deduction and analysis of a large amount of data, resulting in cost reduction, the development of new products, the creation of optimized tenders, and the emergence of market trends. The automation and simplification of internal business operations are also crucial. Decision-making will be aided by the smart integration of systems and data derived from them (Kocielniak & Puto, 2015).

According to Johnson (2012), 15 of the 17 US economic sectors have more data held per firm than the US Library Congress, which collected 235 terabytes of data in April 2011. Big Data Analytics looked at a variety of sources, including social media, the public web, archives, docs, business apps, and more (Reddi, 2013). These data sources are utilized in analytics to solve company goals like cost reduction, improving sales strategy, pricing, developing new products and services, and risk management among others.

The way information is arranged and how it is used to make decisions is becoming increasingly significant. According to a poll done by McKinsey (2011), Big Data analysis has the potential to become a major foundation for competition, productivity, and innovation. Companies can gain a competitive advantage by using Big Data Analytics outcomes in business (Kocielniak & Puto, 2015). Using traditional data to aid decision-making, on the other hand, is not new: For example, determining favorite product features based on user preferences (Ziora, 2015), which data is gathered during the product evaluation phase to make decisions about the new product (Barbacioru, 2014). Big Data, on the other hand, differs from typical data in various ways, including volume, velocity, variety, and validity (Chen et al., 2014).

According to Vahn (2014), Big Data can potentially provide new and more detailed information for use in corporate decision-making. Furthermore, according to a poll done by Capgemini (2012), participants who used data analytics saw a 26 percent gain in business performance and projected this number to rise to 41 percent shortly. Furthermore, a study done by Kaskade (2013) with over 300 IT employees found that roughly 52 percent of respondents were working on a Big Data project, and approximately 59 percent of them ranked Big Data Analytics as one of their top five business priorities.

Several authors have defined big data in various ways. Big data has been defined as a cultural, technological, and intellectual phenomenon by Boyd and Crawford (2012), and as the ocean of information by Fan et al. (2014). Big data is described as a large volume of structured and unstructured data, according to Kitchin (2014). Big data is defined by Waller and Fawcett (2013) as datasets that are too vast for typical data processing methods and so require new technologies to process. It is described by Dubey et al. (2015) as "conventional enterprise machine-generated data with social data." The vast volume of data – both organized and unstructured – that inundates a firm daily is referred to as big data. But it's not the quantity of data that matters. What matters is what organizations do with the data. Big data can be studied for insights that lead to better business decisions and strategic movements.

Businesses are gaining deeper insights into their data customers, products, and operations thanks to large volumes of big data, which also come with a few issues. Customer-centric rapid innovation, enhanced performance, better decision-making, and keeping the competitors on the run are all enabled by data insights (Moorthy et al., 2014; Glinska, 2016). Businesses' functional capabilities have improved as a result of advances in technology and data quantities, and new possibilities have been explored. Businesses are employing new disruptive and

inventive techniques to redefine creativity, competition, and productivity by breaking away from established approaches (Mazzei & Noble, 2017).

Businesses that start using big data early will undoubtedly benefit. Data is a vital component of business performance, as is its advantage of making better-quality judgments based on data than its competitors. Such choices are more precise (DeLone & McLean, 2012). High-quality data volumes are a very precious asset; they are not only valuable and rare, but they are also impossible to duplicate; there is no substitute for them, and they can provide firms with a long-term competitive edge. Many companies are scrambling to use big data to plan their strategy and compete based on data (Prescott, 2016).

Big data analytics yields a plethora of insights that lead to more informed decisions. It's always fascinating to learn about varied possibilities from such observations. Product development and feature priority, advertising testing, brand strengths, marketing mix optimization, pricing, consumer segmentation, and text mining are all examples of decisions aided by big data analytics. Big data analytics aids in making more informed and better decisions (Agrawal, 2014). Big data insights are extremely useful, and they promise to improve decision-making in sectors as diverse as health care, economic productivity, energy, and natural disaster prediction (Yi, Liu, Liu, & Jin, 2014).

Extant research studies have indicated that firms can gain tremendous value and competitive advantage by making good decisions based on data, according to Sivarajah et al. (2017). Businesses are putting a lot of effort into using big data to make business decisions. In a word, big data may add value to a company's bottom line while also increasing sales (Segarra et al., 2016). The majority of organizations, regardless of size, are considering leveraging the power of big data to better their decision-making. Big data new strategies for effectively exploiting enormous amounts of data to help decision-making and knowledge discovery have been promised by future technology (Storey & Song, 2017).

1.1 Problem Statement

Business executives are confronted with high customer expectations, fierce competition, growing labor and material prices, and shorter product lifecycles in today's world. The lines between nations are becoming increasingly blurred as a result of globalization. Access to the markets is no longer limited by location or distance from the market. Firms must constantly search for risks and possibilities in such a turbulent market, and make business choices rapidly based on available data (Jeble et al., 2017).

The big data revolution is more powerful than previous analytics. Managers can make better decisions based on evidence rather than intuition when they use big data. Big data assists in creating more accurate predictions and more informed decisions (McAfee et al., 2012). Big data is being used by executives in a variety of businesses to improve management methods. Several studies have been undertaken in specific domains such as transactional data, social media data, and supply chain big data. However, there is a lack of holistic review of understanding potential of big data for decision-makers. Driven by this need, the current paper explores the role of big data aspects in business decision-making.

1.2 Purpose of the Study

This paper aimed to identify through empirical review the role of big data in business decision-making.

2.0 Literature Review

2.1 Theoretical Framework

The study is based on Davis's Technology Acceptance Model (TAM), which he created in 1989. TAM's goal was to explain the general determinants of technology acceptance, which led to a better understanding of users' behavior across a wide range of end-user computing technologies and populations. Perceived Usefulness (PU) and Perceived Ease of Use (PEU) were the two beliefs examined. Perceived usefulness was concerned with an individual's subjective likelihood of using a system that improves his or her actions. The degree to which the potential user expects the target system to be simple to use was the emphasis on Perceived Ease of Use (Davis, 1989). Venkatesh and Davis (1996) refined this model after the key findings of perceived usefulness and perceived ease of use were discovered to have a direct impact.

Perceived benefits are measured on a scale of whether work is done faster, work efficiency, increased productivity, efficiency, and usability. The perceived usefulness scale includes whether the technology is easy to learn, clear and understandable, easy to use, controllable, and easy to remember. In addition to the two aspects mentioned above, the model takes into account external factors as factors that influence the intention and actual use of technology (Davis, 1989).

One criticism of studies adopting the TAM model is that self-reported usage data is used to measure system usage, rather than actual usage data. Self-reported usage data is a subjective measure and therefore cannot be relied upon to measure actual use of a system (Auerbach, 2003; Cheng, 2005). According to this theory, the impact of big data technology depends on its perceived usefulness and user-friendliness. In this article, the focus is on the impact of big data on decision-making. TAM is therefore relevant in this paper as it represents the concept of the perceived utility of big data in promoting decision-making in firms.

2.2 Empirical Review

Turner and Atkinson (2018) looked into the potential challenges to big data integration within firms and how they could be overcome. An interview-based technique was employed to gain more in-depth knowledge. To better comprehend the gaps found by prior studies, a variety of business sources were investigated. In-depth interviews were used for primary research. Respondents from Ebiquity PLC, Satalia, and Barclays were carefully chosen based on their industry knowledge and experience. The interviews were utilized to compare and contrast the experts' perspectives and see if the important themes highlighted in the literature were confirmed in the primary research. This analysis discovered how important big data is to corporate performance, as well as a growing divide between those who have adopted data huge sets and those who have not. It was also recognized that on the overall, knowledge and comprehension trail well behind the benchmarks established by several businesses.

Björkman and Franco (2017) investigated big data analytics as a new technology and how it influences decision-making. To investigate this, the authors conducted empirical research in the newspaper industry, which is experiencing a crisis due to declining revenues, the collapse of old business models, and the loss of traditional news jobs, prompting the industry to turn to big data analytics as a means of staying competitive. A national newspaper, a national targeted newspaper, and a local newspaper were investigated for parallels and differences, as well as an industry study. The findings revealed that the greater the impact on decision-making the further companies progressed in their work with big data analytics analysis and dissemination.

Decision-making is becoming more transparent, accurate, efficient, and speedier, according to the findings.

Shabbir and Gardezi (2020) investigated the link between big data analytics (ABDA) and organizational performance (OP) in small and medium businesses (SMEs). In addition, the mediating role of knowledge management practices (KMP) in connection to the ABDA and OP was investigated in this study. A customized instrument was used to collect data from respondents working in SMEs. To test the mediation, the researchers used the Baron–Kenny method. The ABDA had a favorable and significant impact on OP, according to the findings. In addition, in SMEs, KMP has somewhat moderated the link between ABDA and OP. The dataset only included SMEs from Pakistan; therefore it may not be representative of other locations. As a result, the results' generalizability is limited.

Ghasemaghaei and Turel (2021) looked at the potentially detrimental consequences of big data on the quality of firm decisions. While conventional wisdom holds that big data enables improved decision-making, this is not necessarily the case, since big data elements can also provide and incentivize knowledge concealment. The study combined adaptive cost theory with a resource-based view of the firm to investigate this possibility. This integration implies that the impact of big data features (data variety, volume, and velocity) on business decision quality can be explained in part by data analysts' perceived knowledge-concealing behaviors, such as evasive hiding, playing dumb, and rationalized hiding, among others. The study used survey data from 149 data analysts at companies that employ big data to varied degrees to test this concept. The findings revealed that different aspects of big data had different effects on knowledge concealment behaviors. Knowledge concealing was facilitated by data volume and velocity, but it was lowered by data variety. Furthermore, evasive concealing, playing dumb, and reasoned hiding all had different consequences on the quality of firm decisions. Playing dumb did not affect firm decision-making quality, although evasive concealing did, and justified hiding increased it. Applicability checks were used to confirm the results. Finally, our findings explain why previous findings on the return on investment in big data have been contradictory, and they provide a unique view into the potential "dark sides" of big data.

Big data drives and impacts innovation, competitive advantage, productivity, and decision support, according to Shahid and Sheikh (2021). A thorough assessment of the literature on big data was conducted, to determine the impact of big data analytics on innovation, competitive advantage, productivity, and decision support. There was a gap between existing frameworks and the integration of big data into various business and management tasks and objectives, according to a review of scholarly literature and existing case studies. The findings are intriguing in that the literature is replete with concepts and frameworks for achieving the end objective for a company or management function, but there is little information accessible in the literature on how to integrate big data analytics into those frameworks. A major topic, according to this paper, is what are the essential actions that enterprises should take to incorporate and integrate big data analytics into current frameworks to fully harness the big data potential. According to a review of the literature, "Big Data" is crucial in driving innovation, gaining a competitive advantage, increasing productivity, and assisting in data-driven decisions. Businesses are using consumer data to create customer-centric products and services, putting the competition on the defensive, increasing productivity at all levels, and making intelligent decisions every day. Smarter big data solutions and insights will drive the future.

To assess the impact of Big Data in the retail industry, Seetharaman, Niranjan, Tandon, and Saravanan (2016) selected and analyzed four factors: data source, data analysis tools, financial

and economic outcomes, and data security and privacy. The influence of big data analysis on retail organizations that use data and business analytics to make decisions, often known as a data-driven decision-making (DDD) strategy, is examined in this study. The financial and economic outcomes were strong, and they had a direct link to the retail industry's data analytic technologies. A survey of diverse business strategies and investments in information technology by retail firms was used to gather data for the study. Retail firms that utilize DDD have higher output and productivity, according to the data. The association between DDD and performance was also obvious in dimensions of organization such as inventory usage, customer engagement, and market value in the retail business.

Kagechu (2018) investigated the impact of big data on the organizational performance of Kenya's publicly traded commercial banks. A descriptive research design was adopted in this study. The study's population included all managers or individuals in managerial positions in each of the 11 mentioned commercial banks' information technology, finance, operations, marketing, and customer service divisions. The study found that big data had a beneficial influence on the performance of Kenya's publicly traded commercial banks, as it improved customer service, reduced marketing and maintenance expenses, and allowed for better resource allocation and informed decision-making. Companies that use big data can increase their return on investment by removing obstacles that may impede their ability to fully utilize the insights received from big data. According to the study, Kenyan commercial banks should focus on business analytics to better manage resources and reduce bank hall congestion by identifying patterns and correlations. According to the survey, listed commercial banks in Kenya should invest in the relevant big data analytics tools and empower their personnel to use the tools and act on the insights gained to get the most out of business analytics technologies.

3.0 Methodology

The paper adopted a desktop research design. The design involved a review of existing studies related to big data aspects and business decision-making.

4.0 Result and Discussions

The review of literature revealed that the use of big data significantly influences business decision-making. The paper found that decision-making is becoming more transparent, accurate, efficient, and faster with the application of big data. The paper also established that big data aspects including data variety, volume, and velocity were critical in determining informed business decision-making.

The review of the literature suggested that big data is playing an important role in innovations, creating competitive advantage, enhancing productivity, and assisting in data-driven decisions. Businesses are taking advantage of the customer insights are innovating products and services which are very customer-centric, keeping the competition on the run, improving productivity at all levels, and making educated decisions.

The review further indicated that businesses, which use data-driven decision-making have higher output and productivity. The relationship between data-driven decision-making and performance was evident in aspects of organization such as the utilization of inventory, customer engagement, and market value. In addition, big data-enhanced customer service led to cost saving in marketing and maintenance costs, led to optimization of proper resource allocation, and informed decision-making.

5.0 Conclusion

The paper concluded that big data can create new possibilities and immense opportunities for businesses to manage knowledge effectively. This paper attempted to identify and discuss the roles of big data and make extensive contributions in linking the concept to decision-making. The paper further concluded that high volume, velocity, and variety of big data play critical roles in informing and enhancing the quality of business decisions. Businesses using big data can be assured of a return on investment more so if they eliminate challenges that could limit the full capabilities of implementing the insights gained from big data.

6.0 Recommendations

The paper recommends that organizations should optimize business analytics to make informed decisions that are more transparent, accurate, efficient, and faster. The paper also recommends that for organizations to reap the maximum benefits from business analytics technologies, they need to invest in the right big data analytics tools and empower their personnel to use the tools, and act according to the insights gained.

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