

## THE ROLE OF DATA ANALYTICS IN BUSINESS DECISION MAKING

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### ABSTRACT

Companies may get a competitive edge and make better choices with the help of the insights gleaned through Big Data Analytics. Important management concerns include (i) ensuring that data-driven decisions are consistent with corporate strategy, and (ii) fostering communication and cooperation across different departments to ensure that Big Data and information may move freely and efficiently. Big data presents technological difficulties since there are not yet adequate methods for dealing with its diversity, accuracy, volume, and speed. From this investigation, we deduce that there has been less academic attention paid to the problem of incorporating analytics findings into business judgment. At the conclusion of the publication, the authors provide several suggestions for further studies.

**KEYWORDS** Decision-making, Data Analysis, Business,

### INTRODUCTION

Since the 1960s, businesses have relied on data analytics as a vital tool for running their day-to-day operations. Academics have just begun to analyze the implications of data analytics' rapid development for its users, and a consistent taxonomy of different forms of analytics has arisen. According to Gartner's (2014) broad definitions, four groups may be distinguished. Four-Factor Approach: Describe, Assess, Predict, and Treat Descriptive analytics includes the likes of traditional business intelligence (BI) and visualisations like pie charts, bar graphs, line graphs, tables, and produced narratives. The goal of descriptive analytics is to provide a response to the query "What happened?" by a human study of data or content. Diagnostic analytics are a more advanced kind of analytics that use the data or material at hand to answer the question "why did it happen?" via drill-down, data discovery, data mining, and correlations. You can see how human involvement in such analytical work is still necessary. To answer the questions "What is going to happen?" and "What is likely to happen?," Predictive Analytics is an even more sophisticated kind of analytics. As a result of its emphasis on using data to improve decision making, Prescriptive Analytics is regarded as the model's ultimate, most sophisticated type of analytics.

We've established that analyzing data is fundamental to making good choices. Beyond the basics, however, modern businesses rely on data to carry out a plethora of other everyday tasks, analyze their own performance, find new possibilities, and formulate novel strategies.

### LITERATURE REVIEW

**Pooja Nanda et.al (2022)** In spite of these variations, all businesses must make decisions on a regular basis. The four most popular approaches to making decisions are (1) authoritarian, (2) democratic, (3) consensus, and (4) participatory. As organizations have gone worldwide, their employees have grown more reliant on decision-support technologies to help them do their jobs. Model-driven, data-driven, communication-driven, document-driven, and knowledge-driven decision-support systems are all discussed here, along with their historical development and current state of the art. In this paper, we examine the history of decision-support tools over the whole spectrum of organizational activity, from the operational to the tactical to the strategic. Social media analytics and web analytics, two relatively new data analytics methods, have been contrasted to more conventional data analysis-based methods. Case studies from several fields of business have been included to further illustrate decision assistance.

**SoumayahAlghannam (2022)** In 2013, "big data" became a ubiquitous term in the industry. Real-time data, unconventional media data, data generated by information technology, social media, and massive amounts of data all fall under the umbrella term "big data" (BD). Its "5 Vs" (volume, velocity, veracity, value, and variety) mean that it overwhelms internal data and the computing and storage resources available to businesses, making timely and informed decisions impossible. The term "big data" refers to the vast amounts of information on individuals and organizations that may be accessed online, such as demographic information, communications, transactions, and health records. To make sense of it all, experts have developed a set of methods and programs known as Big Data Analytics (BDA). Many companies have begun to see the value in big data analytics and

how it can revolutionize their sales, marketing, and BI efforts. While there has been an increase in study of big data analytics, little is known about its potential or how businesses may fully reap its advantages. This research is an attempt to assess the state of the art in this area by reviewing the advantages and disadvantages of using Big Data analytics to get business insight for organizations.

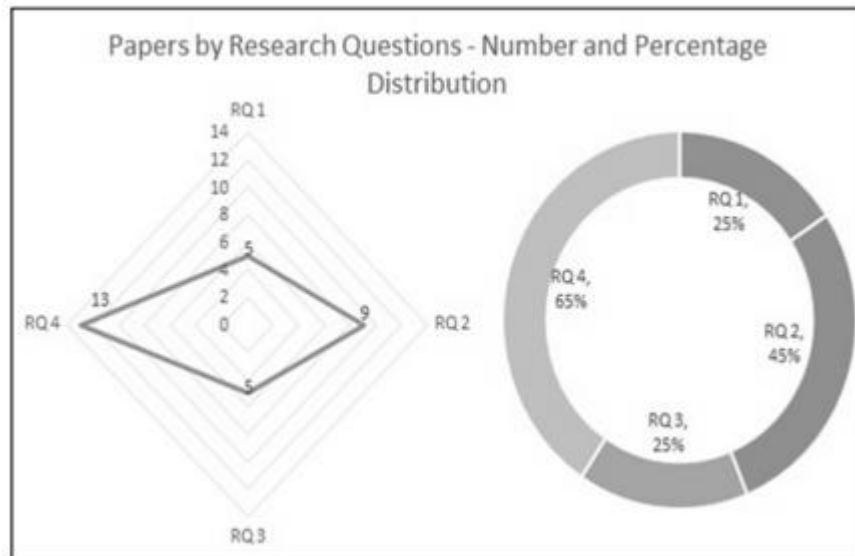
**Usama Awan et.al (2021)** The innovative method of big data analytics (BDA) to good decision-making in businesses may bring about tremendous advances in altering and supporting the CE. Existing research on BDA capacity, however, has just scratched the surface of the potential of data-driven insights to facilitate decision-making and improve CE performance. Data-driven insights, BI&A, and BDA competence, we suggest, are what really propel an organization forward in terms of decision-making quality. The findings indicate that BDA competence and BI&A are favorably linked to the quality of decisions made. The use of data-driven insights by the manufacturer bolsters this impact. The findings prove that BDA competency determines the quality of an organization's decisions and that data-driven insights do not mediate this connection. The quality of decisions made with the use of BI&A is often cited as an advantage. These results are useful for managers because they may be used as a benchmark to guide the development of data-driven insights using the CE paradigm in the workplace.

**Murat Ozemre et.al (2020)** The projected figures are used in the BCG Matrix for strategic market analysis developed by Boston Consulting Group. A fictitious case study involving an exporting Chinese refrigerator and freezer manufacturer is used to verify the suggested technique. The results demonstrate that the suggested technique produces reliable strategic market analysis and trade projections. With regards to making accurate predictions, the RF also outperforms the ANN. Only one case study is provided to evaluate the technique in this research. The suggested strategy may be further expanded in future research to include a wider range of product categories and national contexts. In today's highly competitive business climate, importers and exporters need to be able to make more accurate forecasts and strategic choices based on the results of a thorough strategic market study. Businesses may improve their ability to spot promising new possibilities and adapt their strategies appropriately by adopting the recommended BDA-based approach. – This research is the first to provide a comprehensive framework for employing BDA in strategic market analysis. The suggested technique reliably predicts global trade volumes in the future, which aids in the strategic decision-making process.

**UsaratThirathon et.al (2018)** The impact of Big Data analytics on management decision-making is explored, along with the roles played by analysts' interpersonal skills and the mathematical acumen of upper- and lower-level managers. According to the findings of a recent cross-sectional poll of CIOs, Managers are encouraged to depend more heavily on analytical insights thanks to Big Data analytics' (BDA) availability. We also find that the analytical prowess of managers and the interpersonal skills of analysts are more important factors in the success of analytics-based decision making. Last but not least, our findings suggest that managers at smaller enterprises are both more likely to depend on analytics in decision-making and also more proficient with numbers than their larger-company counterparts. Our findings suggest that managers in smaller enterprises benefit from being in greater proximity to their analysts and analytics in general, which may explain why they are more successful than their bigger counterparts, which is significant given the crucial role that managers' mathematical abilities play in leveraging analytic decision support.

## **METHODS**

A total of 1652 results were found in the first phase (automated search). From the first pool of articles, 49 were deemed promising enough to warrant further review; this included reading the papers in their entirety and evaluating them using a predetermined set of criteria. At this point, we didn't even bother with a score system. Of the 49 papers initially analyzed, 29 were disregarded because they failed to fulfill the quality evaluation standards or because they failed to answer any of the predetermined study questions. In addition, the studies that were left out did not focus on the primary purpose of this SLR (discussed in Section 1). There were a total of 58 articles that were considered for this SLR, but only 20 were chosen. Eleven research articles (55% of total) appeared in peer-reviewed journals, four in conference proceedings (25%), and five white papers (25%) were released by prestigious corporations. About a quarter (5 studies) of the evidence provided led to answers to RQ1. It was addressed in 9 research, or 45%. 25% (5 research) addressed RQ3, while the bulk, almost 65% (13 studies), addressed RQ4. Research questions are included in Table 1 and distributed throughout the investigations. In Fig. 1 we can observe a quantitative breakdown of publications according to their underlying research issue. Table 2 summarizes the range of publication dates for the included research. According to the data shown in the above graphic, the first references to the Big Data oriented results appear in the literature around 2011.



**Figure 1: Numerical Distribution of Papers by Research Question.**  
**Table 1: Number of Studies by Year.**

Year	2011	2012	2013	2014	2015
<b>Number of Papers</b>	2	2	3	5	8

Results for each study topic listed in 2.2 of Section 2 are discussed below.

**RESULT**

**RQ1: How Are the Results of Big Data Analytics Used by Management in Corporate Decision-making?**

The benefits of Big Data Analytics as a decision-making tool are discussed in 14 of the 20 publications examined, but there is no guidance on how to use these findings in practice.

According to Galbraith (2014), fast-response teams should process analytics findings in real time throughout the analysis phase. This may lead to impaired judgment. He proposes using analytics in a way that forces the team to deliberate over the findings and settle on solutions in real time. However, considering how to organize these efforts in a manner that promotes quick decision-making is essential. One piece of advice is for companies to form interdisciplinary groups tasked with keeping tabs on data flows and taking appropriate action in real time. Analytics systems aggregate data from a wide range of sources and use the insights to guide decisions in real time. In this way, firms may steer the outcome and prevent issues.

To demonstrate how real-time supply chain management might benefit from big data analytics, Galbraith provides the following scenario. "At Company A, we have conference rooms outfitted with video walls and computers with access to a wide range of databases. The spaces are set up to promote collaborative decision-making in the moment. Therefore, a plant shutdown is planned when sensors in a paper machine at a particular area in the Pampers factory indicate that it needs repair. If it seems like the machine will be down for some time, the Albany, Georgia factory may be used to supply firm A. With the use of analytics, drivers may figure out how to reroute their vehicles while still fulfilling all of their delivery obligations to consumers.

Analysis of data and generation of quick and intuitive reports, so-called user friendly reports, with the goal of empowering decision-making and providing competitive advantages to businesses was highlighted as an important aspect of dealing with analytics results in a study conducted by Probst (2013) within various information technology companies that develop analytics tools. Companies may boost their capacity to make sound decisions with the aid of straightforward reports that lay out all the relevant data in an orderly fashion. In the context of Big Data, Davenport (2013) lays out a 6-step process for making decisions. Here's What You Do:

1. Problem Recognition;
2. Review Previous Findings;
3. Model the solution and select the variables;
4. Collect the data;
5. Analyse the data; and

6. Present and act on the results.

**RQ2: In Which Business Functions Are the Big Data Analytics Results Used?**

Big data analytics has the ability to improve decision-making across all company departments. There are a few examples here and there throughout the books. In this SLR, we detail nine distinct business roles and provide instances of when and how Big Data Analytics may be used to inform decision-making.

**Supply Chain** When making choices on where to locate a warehouse, what products to stock, etc., supply chain managers may utilize big data to get a better picture of the risks involved. Concerns include, "What methods of quality assurance will be implemented?" problems that Big Data analytics can readily solve.

**Product Research and Development** Big Data may help businesses decide what to create next; Quicken the pace of product development. For instance, "How can we enhance the design of the product?" In order to satisfy the needs of the target market, what characteristics should the product have?

**Marketing Management** Choices in marketing, such as how to define product marketing techniques or how customers feel about a firm or its offerings. When and where can we get this? How should we utilize images in our marketing campaign?

**Sales and Productivity** Sales strategy formulation and resource allocation optimization To what extent does our present sales force need more training, for instance? How efficient is our present method of making sales? How can we enhance our present method of generating business? How much money do you recommend we put into training? Is there a more efficient method to reduce this expenditure?

**Investment Decisions/Financial Management** Gain a deeper understanding of the best ways to invest your money and borrow money. How can we make the most of our funding options? How much money can I get?

**RQ3: Which Aspects of the Decision-making Process Can Be Affected by Big Data Analytics?**

Decisions used to be made using the knowledge, experience, and discretion of human agents in classical decision-making procedures. In the Big Data setting, data-driven analysis is employed in lieu of intuition, and automated algorithms take over some or all of the operational decision-making process.

What this means is that the human agent may have to perform additional steps not present in the traditional decision-making process (such as: identify the problem, gather the information, analyze the situation, develop and evaluate alternatives, select the preferred alternative, and act upon the problem).

**RQ4: What Are the Impediments to using Big Data Analytics Results for Effective Decision-making?**

Big data analytics has several benefits for consumers, but it also presents certain difficulties. There are a number of administrative and technological hurdles that must be overcome for businesses to fully take advantage of Big Data Analytics. Because of the potential for inconsistent and unstructured data, the Big Data paradigm presents significant technological hurdles.

If information is not shared between departments, or silos, in an organization, it may lead to inefficient decision-making at the managerial level. Naturally, silos are a hindrance to effectively and quickly transmitting data and information throughout the organization, which may lead to inconsistencies in reporting across the presumably geographically dispersed business units.

To fully take use of Big Bata, it is necessary to collaborate across departments and disciplines. When cross-functional procedures are immature, however, businesses lose out on these benefits.

**Table 2: Impediments in using Big Data Analytics Results in corporations**

<i>Decision-Making Related Impediments</i>	<i>References</i>
<ul style="list-style-type: none"> <li>▪ Aligning data-driven decision-making with business strategy and development of the analytics strategy;</li> <li>▪ Leadership of Analytics initiatives;</li> <li>▪ Absence of clear business goals;</li> <li>▪ Managerial behaviour/Culture (Resistance to change within the organization)</li> <li>▪ Talent Management;</li> <li>▪ Organizational Silos;</li> <li>▪ Timely or relevant data across the company;</li> <li>▪ Cost of specific tools;</li> <li>▪ Centralization or Decentralization tendencies;</li> <li>▪ Inconsistent reporting of information among business units, geographies and functional operations;</li> <li>▪ Difficulty in integrate their own data sources within the organization;</li> <li>▪ Speed decision-making; and</li> <li>▪ Time to analyse the datasets.</li> </ul>	<p>Kościelniak and Puto (2015);                      Phillips-Wren and Hoskisson (2015);                      Fan et al., (2015);                      Way and See (2015);                      Brown-Liburd et al., (2015);                      Colas et al (2014);                      Schermann et al., (2014);                      Galbraith (2014);                      Li (2014);                      Economist Intelligent unit (2013);                      McAfee et al (2012);                      Capgemini (2012);                      McKinsey(2011);                      Lavallo et al., (2011)</p>

influence of Big Data. The obstacles to using Big Data Analytics in businesses are outlined in Table 2.

## CONCLUSION

Whether the news is good or bad, it cannot be denied that we rely on data nowadays, particularly in the corporate world. It's no secret that data is now essential to the success of any business, and this trend is only expected to grow. In order to address four research questions (RQ1-4) at the junction of Big Data Analytics and the decision-making process in businesses, a comprehensive literature review was done. This is a novel area of research, and there have been no previous SLR investigations of it that we are aware of. There are five stages to the procedure through which studies are chosen for analysis. Twenty studies were found appropriate and chosen for use in this SLR after following the inclusion and exclusion criteria and going through the quality evaluation procedure.

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