

LEVERAGING BIG DATA AND BUSINESS INTELLIGENCE TO REVOLUTIONISE CORPORATE STRATEGY

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Abstract

The given research paper examines the way in which Big Data and Business Intelligence (BI) transform the corporate strategy. It utilises the secondary qualitative data to examine the ways in which these technologies may be employed in enhancing the decision-making process, making the operations more efficient and developing a competitive advantage. The paper also highlights the problem faced by the businesses in the implementation process, such as data integration, quality problems and the skill gap and also gives future opportunities of adopting more sophisticated technologies such as AI to facilitate strategic expansion.

Keywords: *Big Data, Business Intelligence, Corporate Strategy, Decision-Making, Operational Efficiency, AI Integration.*

INTRODUCTION

The modern-day business environment is becoming dynamic and complex to the extent that organisations are being forced to adopt novel tools to enable them make informed decisions and competitive advantage. They are, among others, Big Data and Business Intelligence (BI) that are currently taking centre stage in policy formulation of corporations. Big Data can be described as large amounts of information that are gathered on a daily basis in different forms such as social media websites, electronic transactions, and customer communications [1]. Instead, Business Intelligence is the structured processing of this information using the assistance of modern tools and technologies in order to convert it into the handy information guiding strategic decisions.

Together, the Big Data and the BI will provide the businesses with the ability to make a better understanding of the customer behaviour, predict the market trends, and optimise their business processes. This results in the improved process of decision making and a leaner operation that is more responsive to the market changes [2]. Collectively, they have changed the way organisations develop and execute strategies and are leading organisations to be more data-driven to enhance flexibility and resiliency.

Research Aim:

The proposed research will focus on the role of Big Data and BI in optimising business strategies, which can result in innovation and competitiveness as well as data-driven decision-making.

Research Objectives:

- To explore the effect of Big Data and BI on improving operations and strategic decision-making.
- To determine the issues and constraints these technologies present to strategy.
- To examine new trends in using Big Data and BI in competitive positioning.

The emerging availability of Big Data and advanced BI applications keeps transforming the business strategy, allowing firms to anticipate changes in the market, automate operations, and improve efficiency [3]. This change is preparing organisations with the innovativeness

and flexibility to succeed in the current competitive business environment.

LITERATURE REVIEW

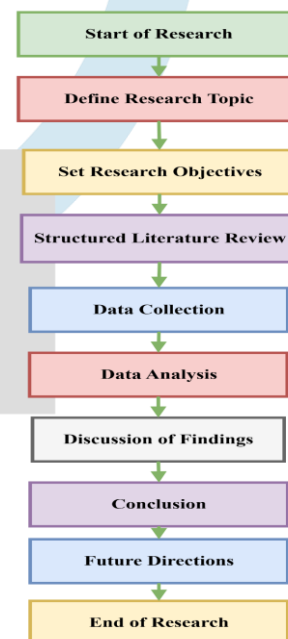


Fig 1: Flow of the Research

Structured Literature Review Approach followed the following steps:

1. Known important databases of literature.
2. Google Scholar, ScienceDirect, IEEE Xplore, and SpringerLink were searched.
3. Searched the Big Data, Business Intelligence, and Corporate Strategy using used relevant keywords to conduct extensive searches.

Academic Database and Source Utilisation for this study are:

1. Draw search queries using special keywords such as Big Data, Business Intelligence, Corporate Strategy, Data Analytics, and Competitive Advantage.
2. Pay attention to the literature that was published within the past 5 years (2018-2022) to remain relevant.

- Use filters of peer-reviewed articles and conference papers to make sure that the results are quality and reliable.

A. Searching Study:

The relevant studies were located in several academic databases, and these were Google Scholar, ScienceDirect and IEEE Xplore. The keywords to be used to search included:

- Corporate Strategy and Big Data.
- Business Intelligence Decision Making.
- Business Transformation and Data Analytics.
- Competitive Advantage with Big Data.

The literature search time frame was concentrated mainly on the articles that have been published within the past five years (2018-2022) to guarantee the topicality and the timeliness of the results.

B. Selection of Journal Articles:

Relation to the topic of the research: The priority was assigned to the articles that covered the problem of Big Data, BI integration into the corporate strategy formation.

Peer-Reviewed Sources: It has also incorporated peer-reviewed journal articles, conference papers and credible industry reports to ensure academic rigour.

Quality of research: It favoured high-quality research designs.

Impact and Citation: The following articles were chosen to include the best and innovative research since they were highly recognised and popular in the discipline.

C. The Goal of the Review:

- Carry out the synthesis of the existing literature on the possibility of using Big Data and BI to influence the corporate strategy.
- Identify the advantages, the disadvantages, and the opportunities that business enterprises will have to undergo as they incorporate the application of the Big Data and the Big Data analytics tools.
- Determine any existing literature gaps that will be used in future studies of the topic.

This review has aimed at developing a logical image of how these technologies can contribute to the development of the business, competitive advantage, and long-term strategy.

D. Study of Previous Literature

Enhancing Operations and Decision-Making

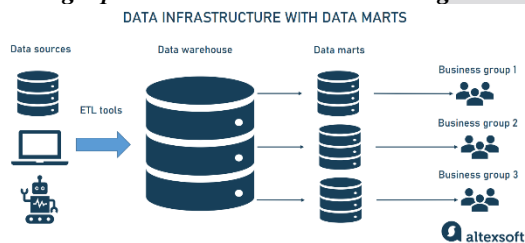


Fig 2: BI Infrastructure

BI and Big Data are playing a significant role in determining the business processes and decision making by providing insight into real time and predictive analytics. According to [4], organisations can use these technologies to automate organisational processes to identify wastage and make optimal use of resources. By examining the massive amounts of data, the companies are granted a chance to get to know better the behaviours of customers, the market trends and bottlenecks in the operations. BI tools like dashboards and reporting systems help the decision-makers to have a visual representation of the information and make appropriate decisions within very short time frames [5]. Predictive analytics ensures that companies are

better predictive of future trends and make strategic decisions. To illustrate, in retailing, data-driven knowledge can be employed in the optimisation of inventory management and in marketing, data can be employed to design specific campaigns depending on the interests of the customers. Lastly, BI and big data enable companies to adapt to changes within a short period and make evidence-based decisions that will ensure progress.

Challenges and Constraints in Implementation

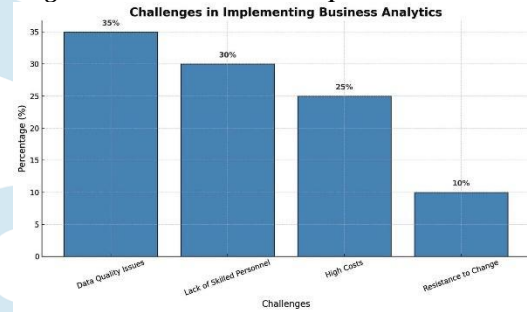


Fig 3: Challenges in BI implementation

Despite the enormous potential, there are several challenges that the implementation of big data and BI technologies poses to businesses. One of the most challenging aspects is the incorporation of these systems in the existing infrastructure [6]. The point is that most organisations have legacy systems that are quite out-of-date, thus it is not simple to include new sources of information and tools. There is also the issue of data quality that is normally experienced in companies were poor and inconsistent, or even incorrect data, can complicate the analysis of the data presented in the company. According to [7], one of the privacy concerns and regulations such as GDPR, is also problematic since a company must be capable of ensuring that the information is processed safely and in a morally correct manner. The other limitation is the unavailability of qualified specialists, such as data scientists, BI specialists, who could process and analyse big data. One of the main solutions to the problematic areas is the ability to make an investment in technology and talent.

Future Trends in Big Data Integration

New technologies in the sphere of artificial intelligence (AI) and machine learning (ML) will define the future of Big Data and Business Intelligence and provide a greater chance to learn insights into the data [8]. As the technologies continue to evolve, the companies will probably get more automated with the AI-assisted analytics and provide a more accurate forecast. The data processing in real-time will also become more popular so that the business can react to market dynamics near real-time. According to [9], the alliance of Big Data and Internet of Things (IoT) gadgets will present plenty of new data flows, fresh prospects of efficiency optimisation and individual customer experience. Moreover, cloud computing will take centre stage to make Big Data and BI accessible, affordable, scalable and more affordable to ensure that none of the organization size can afford not to harness the power of data [10].

Literature gap

The literature on Big Data and Business Intelligence (BI) has stated and highlighted their revolutionary nature on the corporate strategy, although the literature has several gaps. Limited research has been conducted on the specific challenges that small businesses put into consideration when adopting these technologies. In addition, BI and Big Data are researched concerning the long-term impacts that

they have on the sustainable competitive advantage. In addition, the literature on the combination of new technologies such as AI and machine learning with BI tools in the development of corporate strategy is little.

METHODOLOGY



Fig 4: Methodological Flow

The philosophy behind this research paper is the *Interpretivist philosophy*, which employs the interpretation of the meaning and context of human actions and social phenomena. In the context of Big Data and Business Intelligence (BI), one can consider how companies can adopt and actually adopt those technologies in the strategic decision-making process [11]. The fact that interpretivism is concerned with a subjective sense that human beings and organisations attribute to their experiences makes it the most appropriate theory to study complex business environments.

An Inductive Research Approach is used whereby theory is developed based on the information collected [12]. In conducting the research, Secondary qualitative data are used as the analysis of the available literature, reports, case studies, and academic articles on Big Data, BI, and corporate strategy [13]. The selection of the sources of *secondary data* is explained by the intention to show a broader and more diversified range of glimpses into other industries and the possibility of obtaining a rather comprehensive picture of the impact of Big Data and BI technologies. The methodology is inexpensive, quick, but with a quality of past studies.

Trends in the data are brought out, analysed and shown using thematic analysis [14]. The process will entail the review of the data, coding of the information of interest, and classifying them under themes, and this will consist of the benefits, areas of concern, and future trends of utilising Big Data and BI in the corporate strategy. The study presents an in-depth understanding of how Big Data and BI are transforming business operations using these themes.

DATA ANALYSIS

Theme 1: BI and Big Data are used to streamline the process of decision-making and enhance operational efficiency in businesses.

These two, namely, Big Data and Business Intelligence (BI), are of immense impact on better decisions that are made in organisations are used and operated [15]. The technologies can assist decision-makers to act by converting raw data into actionable insights that can assist in making more effective business strategies.

Many sources of structured and unstructured data like customer interactions, social media, and transactions, may

be collected and processed with the help of Big Data and, as a result, enable organisations to answer different questions and issues [16]. This data is visualised with the help of BI tools such as dashboards, reporting systems, and, as a consequence, businesses can make informed decisions based on the trends. As an illustration, retail businesses use the analysis of Big Data to analyse the purchasing trends of their clients, organise their stocks, and offer personalised marketing strategies [17]. On their part, manufacturers use BI to track the output of production and identify inefficiencies in the supply chains, thereby reducing costs and resource allocation.

Another significant part of BI useful in improving operational efficiency is predictive analytics. The trends are projected based on previous information with the help of predictive models to allow the companies to manage the resources to minimise downtimes and simplify processes [18]. One such application is predictive maintenance in manufacturing, which is applicable in establishing what is likely to occur so that equipment failures can be anticipated before they occur, minimising the downtime and maintenance costs.

It also has real-time data analysis that enables the business to respond to the market in a very swift manner. The firms can control the key performance indicators (KPIs) in real time, e.g. sales, inventory and customer satisfaction, and the changes of the strategies depending on the current situation become easier [19]. The Big Data and BI assist business organisations to identify better methods of making decisions and executing operations, which will enable them to utilise their resources effectively, reduce costs, and be competitive within the fast-evolving environment. These technologies are important in the success of a data-focused business world.

Theme 2: Organisations have great issues when trying to implement the Big Data and BI and one of them is the system of integration and data quality.

The applications of Big Data and Business Intelligence (BI) technologies present numerous challenges to organisations, particularly the challenges relating to integration, data quality, and access to skilled personnel [20].

Integration is considered one of the key challenges. The majority of companies are operating old-fashioned systems, which are not able to cope with the current applications of Big Data. The integration of BI applications with new infrastructure, such as customer relationship management (CRM) systems, enterprise resource planning (ERP) systems, etc, may prove to be a long and costly process [21]. Very often, these systems are not architected in terms of scale and complexity of Big Data, which leads to inefficiencies and latencies in processing the data.

The information to be incorporated in the BI tools must be correct, uniform, and exhaustive in order to generate trustworthy data. However, the absence of regularity of data, missing values, or failures is a common problem within most organisations due to the incompetence of data governance strategies [22]. This leads to wrong analyses and wrong decision making. Companies have to invest in excellent data management systems in order to clean their information, standardise and validate it prior to subjecting it to analysis, which may consume considerable resources.

Theme 3: AI, IoT, and Big Data will be incorporated into business strategy and operations in the future.

In the future, the business strategies and operations will transform due to the combination of Artificial Intelligence

(AI) with Internet of Things (IoT) and Big Data. When combined, they provide massive opportunities to companies to be empowered to make better decisions, become more efficient, and be innovative [23].

AI plays a key role in the process of analysing complex data sets and automated decision-making. With machine learning algorithms, AI can be used to process past and up-to-date data to make predictions and simplify operations, and even automate repetitive processes. In an indicative way, predictive analytics based on AI can be employed to forecast future market trends, hence the companies will not operate in reaction to the trends. The AI would also be capable of optimising the production schedule and decreasing the downtime in manufacturing with predictive maintenance.

The IoT is relevant in the sense that it can be connected with the physical devices and sensors to the internet to generate immense amounts of real-time data. To illustrate this, smart devices with IoT can identify the inventory stocks in time, which allows the company to adjust the production and distribution plan when it is necessary [24]. Similarly, the IoT gadgets may be applied in the medical industry to monitor the vital details of the patients and give real-time data that can be applied in tailor-made medication.

Big Data is also used to support the integration as it provides businesses with the ability to store, process, and analyse large volumes of structured and unstructured data. With the integration of the Big Data analytics and the AI and IoT, companies will be capable of engaging valuable insights provided by various sources of data, which will lead to better and efficient decisions [25]. The involvement of AI, IoT, and Big Data will be incorporated to transform the business practice in the future. The technologies also allow organisations to be innovative, competitive and efficient in their operations and this translates to business success in the long run.

RESULT AND DISCUSSION

Introduction of Big Data and Business Intelligence (BI) in business strategies has proved to be quite helpful in many industries. These technologies assist organisations in making data-driven decisions and this is enhancing strategic planning, not mentioning, operational efficiency [26]. Big Data provides immense information regarding customer behaviour, factors into the adequate prediction of the market, and the businesses, which results in establishing a more competitive advantage.

BI tools, nonetheless, are significant in evaluating the effectiveness of the operations based on workload, reduced costs, and enhanced utilisation of resources. Forecasting analytics is one of the key features of such tools that help to identify the potential problems, such as equipment malfunction or low supplies, and prevent them prior to becoming crucial, thereby reducing the downtime and minimizing the expenses that are not beneficial to the organization [27]. It is a predictive power that makes decision making stronger in dynamic businesses.

Some problems are still present, including the problem of data integration, the question of data quality, and the existing skills gap connected with the work with advanced analytics. Such barriers are just but few of the issues that organisations must strive to improve on to reap maximum on Big Data and BI [28]. Lastly, the technologies are potential to a staggering degree but it requires significant

investments in the high-quality data management and talent development to remain competitive in the world that is increasingly becoming data-driven.

Implementation of the Study:

- The study is based on secondary qualitative data such as academic articles, case studies and industry reports.
- Thematic analysis approach was used to determine recurrent patterns and important insights.
- In particular, the paper is dedicated to the role of Big Data and BI in corporate strategy and organisational efficiency [29].

Limitations of the Study:

- The research only involves the use of secondary data that could disqualify a variety of opinions.
- Results are mostly based on large organisations hence making it less definite in generalising to SMEs.
- The quality and the availability of the available literature and published sources would determine the depth of the analysis.

FUTURE DIRECTIONS

The next generation of studies should be done regarding combining new technologies with Big Data and BI like artificial intelligence and machine learning, especially in real-time analysis. Moreover, the analysis of their impact on the small and medium-sized enterprises (SMEs) and emerging industries would bring more insights into the issue of adoption challenges and opportunities [30].

CONCLUSION

BI and Big Data make a remarkable change to corporate strategies by enhancing the decision-making process and optimization of operations. Although issues such as data integration and quality remain in the implementation process, the barrier will eventually be broken, and the more companies will be able to develop new growth opportunities and become more competitive in the increasingly data-driven world and will be able to be successful in the long run.

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