

The Role of Data Science and Analytics in Predictive Modelling and Decision-Making

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Abstract- The phrase "big data" refers to the massive amounts of data that have been created as a direct result of the integration of information systems with the internet, cloud computing, mobile devices, and the Internet of Things (IoT). This has led to the production of "big data." As a consequence of this, there has been a growth in the production of what is known as "big data." A data warehouse, information, and online analytical processing (OLAP) are the three independent components that come together to form this real-time data repository. Together, these three elements constitute the repository as a whole. It is composed of real-time data that can be organised, semi-structured, or unstructured, and all three types are incorporated in its make-up. Both commercial companies and academic institutions have developed novel strategies that are their own in order to get value from massive volumes of data. When it comes to making decisions, leveraging huge datasets as an additional input gives a wide range of options to consider. This research will analyse the role that big data plays in the aforementioned fields in order to facilitate improved decision-making by providing more accurate information. In this piece, we will study how big data may be used to make educated decisions in real time, with the ultimate aim of improving business results as a result of these decisions. The study does a literature review and looks at secondary data in order to provide a conceptual overview of the potential opportunities that big data affords for use in decision making. These were accomplished by looking at secondary data. This article discusses a variety of subjects, including the concept of "big data," its role in the decision-making process, and the competitive advantage that big data offers to a variety of enterprises. In addition to that, the research investigates a technique for the management of data in relation to the process of

decision making. It is essential to have a conversation about the issue in order to provide superior options for companies, which will lead to increased levels of competence.

Indexed Terms- Data Science, Data Analytics, Decision-Making

I. INTRODUCTION

The initial function of information systems was to only record transactions; but, throughout the course of time, this function has evolved into one in which the systems now provide assistance for various levels of corporate decision-making. Conventional information systems relied almost exclusively on in-house data sources, such as enterprise resource planning (ERP) programmes, when it came to the process of making choices on the operations of the company. A relational database management system, sometimes known as an RDBMS, was utilised so that these datasets could be organised. These were put to use in order to provide support for internal business decisions such as inventory management, among other applications. pricing decisions, determining the most valuable customers, and locating products that were losing money, amongst other things, amongst other things. In addition, with the data that was obtained, a data warehouse that can be put to use for analysis and mining was built.[1] In order to combine the data from these sources with that of other business partners, such as suppliers and customers, platforms for enterprise application integration (EAI) were deployed. The seamless integration of information systems amongst business partners was made feasible by EAI's provision of this capability. It cut the cost of business-to-business (B2B) transactions between organisations while at the same time increasing the speed of business-to-business (B2B) transactions and communication. The

succeeding phase, which started in the early nineties and was defined by the introduction of the internet, which considerably helped the integration of enterprises with their respective business partners, was characterised by this phase's defining characteristic. Large quantities of data, often referred to as big data, have been produced over the course of the previous ten years as a direct consequence of the proliferation of information technologies such as the internet, cloud computing, mobile devices, and the Internet of Things (IoT). In addition to information warehouses, online analytical processing (OLAP), and enterprise transformation layer (ETL), it contains organised, semi-structured, and unstructured real-time data. The discipline of computer science has advanced to the point that it is now able to store and analyse vast quantities of different datasets by making use of statistical approaches. Both commercial companies and academic institutions have developed novel strategies that are their own in order to get value from massive volumes of data. This study's objective is to research the function that big data plays in the decision-making process as well as the many methods in which big data may be employed to produce judgements that are both intelligent and timely in order to enhance the outcomes for businesses.[2,3]

The analytics that were applied in the past are not nearly as effective as the revolution that has been brought about by big data. It is possible for managers to improve their decision-making abilities by shifting their dependence from intuition to evidence when they make use of enormous volumes of data. According to McAfee et al. (2012), big data gives organisations the ability to increase their ability to foresee and to make decisions that are better informed. The amount of data that companies are collecting considerably exceeds what is required for any given reason. The most successful companies in every sector are making use of big data in order to refine their management practises. There are a number of separate studies now being conducted, each of which is concentrating on a particular facet of data, such as transactional data, data derived from social media, big data derived from supply chains, and so on. [4,5] On the other hand, there has not been nearly enough research conducted to fully appreciate the opportunities presented by big data for those in

charge of making decisions. Because of this requirement, we are compelled to study the role that various forms of big data play in the decision-making process in a variety of different settings. This article will serve as a way of bridging the aforementioned gap if it is successful in achieving the aims that are described below:

- a) To conduct research on the existing body of written material pertaining to the fundamental principles of big data and the role it plays in the process of decision making.
- b) To conduct research into the influence that large amounts of data have on decision-making at the strategic, tactical, and operational levels.

The research is useful in aiding with the process of making big choices utilising vast amounts of data, and it does this by providing useful information. Large volumes of data are being put to use in a range of commercial and educational contexts in the current day. As a result of this, we have been able to become more accurate in both our predictions and our evaluations.[6]

After this, we will do a literature analysis on big data and the ways in which it is becoming increasingly relevant for both business and society. This will follow the previous step. In the following paragraphs, we will explore a variety of definitions of "big data" that have been offered by experts in the disciplines of "big data" and "analytics." In addition to this, we will go over the several classifications that may be utilised in order to structure the applications of analytics. In the third part of this series, we will go through a number of different applications and benefits of big data. In this part, we take a look at the numerous approaches that organisations such as banks and other commercial organisations have used to effectively acquire, evaluate, and put big data to use in order to enhance the overall operational efficiency of their businesses. These methods include big data analytics, data visualisation, and more.[7,8]

It's nothing new for the most successful companies, but using analytics to drive decision making and backing it up with vast quantities of data has become increasingly common. Despite this fact, there are still a great number of small and medium-sized businesses that have the potential to begin capitalising on this

rapidly expanding industry. In the next section of this essay (part four), we are going to talk about a potential framework for big data that companies like these can apply. This framework might be used as a springboard for further building a model that is suitable for their own organisations. In this article's concluding section, we draw conclusions about our study based on our findings and offer recommendations for more research that should be conducted.[9]

- *What is Big Data?*

If you check a number of different authors, you will find that the meaning of the term "big data" can be construed in a number of various ways. While Boyd and Crawford (2012) describe "big data" as a cultural, technical, and intellectual phenomenon, Fan et al. (2014) refer to it as "the ocean of information." Both descriptions are accurate. According to Kitchin (2014), the term "big data" refers to a significant amount of data that may or may not have a preset organisational scheme. This information may also be referred to as "data lakes." According to Waller and Fawcett (2013), the phrase "big data" refers to datasets that are too vast to be handled using standard ways of data processing and, as a consequence, call for the creation of new technologies. In other words, big data necessitates the development of new technologies. According to Dubey and colleagues (2015), it is made up of both the traditional corporate machine produced data as well as social data. In other words, it is a combination of the two. Big data is a word that is used to represent the enormous amount of data, both structured and unstructured, that floods an organisation on a daily basis. This data can be either intentionally or accidentally collected. This data may be organised or it may be unstructured. Both are possible. There are a lot of various organisational schemes that might be used for these data. However, the quantity of the data is not a consideration in making a decision regarding the applicability of the findings. The importance lies in what organisations do with the data once they have it in their possession. The examination of significant volumes of data can produce insights, which, in turn, can lead to improvements in judgement and in the strategic actions taken by an organisation.[10,11]

According to Dyche (2014), the concept of big data,

in the perspective of a large number of individuals, is nothing more than millions of data that may be evaluated using a variety of different technologies. Big data, in its purest form, refers to the efficient use of data in any setting by making use of a wide variety of technological platforms. The first decade of the 21st century witnessed the rise of big data, which was first welcomed by internet and startup organisations. During this time period, big data was mostly utilised by online companies. According to Davenport and Dyche (2013), there is a new type of data that has evolved, and it consists of voice data, text data, data from log files, data from pictures, and data from videos. The productive use of large amounts of data results in the creation of a wide variety of applications that are useful in the process of decision making.[12] Utilising a wide array of approaches and tools helps to improve one's ability to make judgements. Companies such as Amazon and Netflix have developed algorithms in order to identify similarities between customer searches and prior purchase histories. This allows the companies to make predictions regarding the kind of products customers are likely to purchase in the future. Customers are offered products that correspond to what they have already looked for, or they are provided with product suggestions based on the products they have already purchased.[13,14] Because of this, there is a greater possibility that customers would buy some of the goods that have been suggested, which ultimately results in an increase in sales.

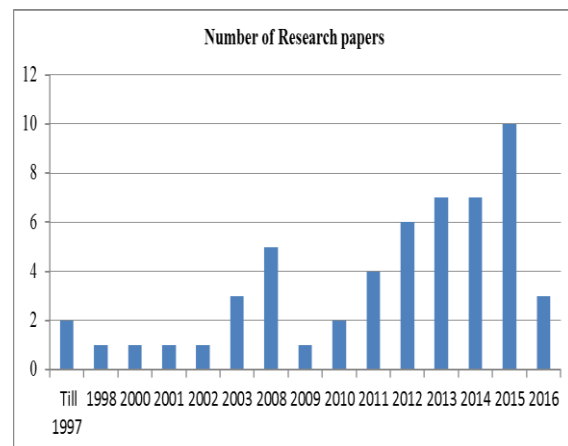


Figure 1 classification of research articles published in leading journals according to year [15]

sales. This method may be responsible for as much as one third of their new sales, according to Artun and Levin (2015). In the field of telecommunications, businesses go through massive volumes of consumer data to identify which of their clients are most likely to switch to a competing provider. This aids in the establishment of regulations with the goal of retaining current customer connections.[16]

• Five Vs of Big Data

The practise of collecting and storing enormous volumes of information for the purpose of conducting later analysis has been around for a very long time, despite the fact that the phrase "big data" is a more recent coinage. The industry analyst Doug Laney described the now-mainstream definition of big data as the three Vs – volume, velocity, and variety – in the early 2000s, which is when the idea began to gain traction and become more widespread. Big data is currently defined using the five Vs, which are summarised in Table 1 below. This represents a further refining of the concept.[17]

Table1 FiveV'sofbigdata[18]

Characteristics	Description
Vol.	The amount of data that can be stored, often expressed in terms of terabytes or petabytes, has been about doubling every forty months (Davenport, 2014).
Velocity	The rate of data accumulation is increasing at every organisation and organisation, and this trend can be observed everywhere.
Variety	There is an abundance of data sources, some of which include corporate systems, social media, text, video, and audio as well as email, radio frequency identification, web apps, and other digital devices.
Veracity	The accuracy of the decision-making process is directly proportional to the quality of the data that is used in that process.
Value	The capacity to draw value from different sources of data can lead to

	advances in the social and economic consequences of an investigation.
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When it comes to big data, the reputable data analytics company SAS takes into consideration two extra dimensions, such as variability and complexity. Variability-In addition to the growing rates and kinds of data that are being generated, data flows can be highly unpredictable, with periodic peaks. This is in addition to the fact that the amount of data being created is also expanding. This is also true with regard to the varied nature of the data that is now being created. Is there a topic that appears to be the talk of the town on all of the social media platforms right now? The management of peak data loads on a daily, seasonal, or event-driven basis can be difficult, and the introduction of unstructured data makes it far more difficult to do so. These types of loads can be triggered by an event. The fact that the data now being used comes from such a wide variety of sources is one of the contributing factors that makes it challenging to link, match, clean, and convert data across many systems. This reality further complicates the problem. However, in order to stop your data from quickly spiralling out of control, it is essential to connect and correlate relationships, hierarchies, and various data linkages. Only then will you be able to stop it from happening.[19]

• Different Sources of Big Data

Traditional information systems are just one of the many places from which big data can originate, along with the likes of social networking websites, cloud applications, software, social influencers, data warehouse appliances, public, network technologies, legacy documents, business applications, meteorological data, and sensor data. In addition to this, sensor data may be utilised to generate big data. Several of the sources are summarised in the following paragraphs.[20,21]

• Transactional data

Transactional data, when paired with statistical methods such as regression analysis and decision trees, may be helpful in establishing a model that can predict outcomes such as sales projections or the degree to which a new product will be successful

when it is brought to the market. Transactional data can also be useful in developing a model that can predict the degree to which a new product will be successful when it is first introduced to the market. Using the inputs of previous data, the model is able to provide predictions about the variable that is dependent on those results. Statistical software tools like SPSS and SAS make the creation of these models quite simple and straightforward. The word "transaction" refers to all of the data from the past that contains independent variables, and the phrase "transactional processing system" is used to define the system that is used to keep track of these transactions. The term "transaction" also refers to all of the data from the past that includes independent variables. In an organisation, the major purpose of a Transaction Processing System is to gather the information and to keep the data as up to date as is practically feasible so that it may be used in the process of making operational choices. Transactions can be handled in one of two ways: either by batch processing, in which the data are processed as a single unit over a period of time, or through a Real Time Processing System, in which the data are processed instantaneously. Both of these approaches are referred to as batch processing. Processing in batches is the approach that has been around the longest. When it comes to making decisions on day-to-day operations, either of these techniques may be effective for any firm.[22]

- Social media data

The rise in popularity of social media platforms over the previous several years have resulted in information being acquired at every possible location around the globe. This has occurred all over the world. The events are being relayed exactly as they are taking place at this very now. On social media platforms such as Facebook, Twitter, and WhatsApp, users of the internet are more than happy to voice their thoughts, provide comments on products or services, and review films within a matter of minutes. Those individuals who are in charge of making judgements will never have another opportunity like this one to gather information about the market. Through the use of social media, individuals are able to share their expertise with one another, which in turn enables customers to make better-informed purchasing decisions by giving them access to

feedback, customer complaints, and other supplemental services associated with a particular product.[23,24] The opinions of customers are sent to companies via social media, which is helpful to these organisations during the process of decision-making about the production of goods. In addition to this, utilising social media analytics, one may collect information on a company's products and services in order to better compete with other businesses. This may be accomplished by conducting research on the goods and services offered by the company's competitors operating in a certain market category. This also stimulates the creation of innovative corporate concepts with the aim of making improvements to the business life cycle. As a consequence of this, the data that can be obtained from social media platforms are of the utmost significance when it comes to making decisions about the strategic, operational, and tactical aspects of marketing.[25]

- Applications that run on the Internet

Millions of individuals are presently browsing through a diverse selection of websites as a direct result of the widespread availability of the internet. This has led to a considerable rise in the number of click streams and online searches that have been made to find products or services. There are a variety of online shopping websites (such as Amazon, Flipkart, Alibaba, eBay, Paytm, bookmyshow.com, and so on), search engines (such as Google, Yahoo, and Bing, and so on), and online banking programmes where millions of people log in and utilise them on a daily basis. Some examples of these websites are Amazon, Flipkart, Alibaba, eBay, Paytm, and bookmyshow.com. When a user does any kind of search or performs a transaction, various click streams and logs are generated. Some of these click streams and logs may prove to be beneficial in the future.[26,27]

- Data from electronic instruments

The analysis of the data in terms of the statistical dependability of the models and the enhancements that may be made to them has become a great deal less difficult as a direct result of this development (Chen et al., 2012).; Big data analytics are employed in the decision-making processes of e-commerce, e-government, politics, science, and technology, in

addition to the decision-making processes of health, security, and public safety. This area includes a wide range of operations, some of which include database segmentation, graph mining, social network analysis, text analytics, web analytics, sentiment affect analytics, criminal network analysis, and multilingual text analysis. In the process of making decisions pertaining to e-commerce, one regularly encounters the application of analytics to substantial volumes of data.[28,29] According to Venkatesh et al. (2010), the multi criteria decision making tool aids in decision making in the health business in order to comprehend the entire assessment process by providing a decision support tool. This aids in decision making is done in order to improve patient care.ch generate high volumes of datasets. These are other sources of big data.

- **BigData Analytics**

In recent years, there has been a surge in the importance of data analysis as a critical instrument for assisting managers in the process of decision making. This assistance has been particularly noticeable in the business world. According to Dyché (2014), the efforts that are invested into the discovery of big data have the ability to uncover outcomes that were unknown in the past, which may lead to insights that are important for the process of management decision-making. In other words, the discovery of big data has the capacity to unearth outcomes that were unknown in the past. People's capacity to recall and make sense of the information they encountered was severely constrained before the advent of computers. In times gone by, there were experts who, when making decisions, would rely their decisions on their gut impulses rather than any other source of information. According to Duan and Xiong (2015), the inferences made based on these experiences were not always entirely reliable because it was not feasible to compile a substantial amount of data. A rise in the quantity, pace, and variety of data has been brought about in the contemporary era as a direct consequence of the advent of big data. The analysis of the data in terms of the statistical dependability of the models and the enhancements that may be made to them has become a great deal less difficult as a direct result of this development (Chen et al., 2012).; Big data analytics are employed in the decision-making processes of e-commerce, e-government,

politics, science, and technology, in addition to the decision-making processes of health, security, and public safety. This area includes a wide range of operations, some of which include database segmentation, graph mining, social network analysis, text analytics, web analytics, sentiment affect analytics, criminal network analysis, and multilingual text analysis. In the process of making decisions pertaining to e-commerce, one regularly encounters the application of analytics to substantial volumes of data.[28,29] According to Venkatesh et al. (2010), the multi criteria decision making tool aids in decision making in the health business in order to comprehend the entire assessment process by providing a decision support tool. This aids in decision making is done in order to improve patient care. This is accomplished by offering a decision support tool. This is done in order to facilitate decision making in the multi criterion decision making tool. In the field of medicine, this is useful information for making decisions. RFID have been deployed for data warehouses, and Zhong et al. (2015) state that they might be incorporated in terms of both the logic and operations of the warehouse.[30]

The analysis of large amounts of data has a significant impact on the value of businesses as well as the performance of businesses. This impact can be seen in the form of cost savings, reductions in operational expenses and communication costs, improvements in customer relations, increased returns, and the development of new business plans. The term "big data analytics" refers to a collection of more sophisticated analytical techniques that may be used to very large data sets. According to Russom (2011), advanced analytics helps users to make more informed decisions by simplifying the process of preparing massive amounts of data for analysis. This results in the users being able to make better decisions. The analysts do comparisons on the historical data that is stored in the data warehouse in order to improve decision-making. This helps ensure that the right choices are made. The end effect is that better judgements are made as a result of this. The investigation of so-called "big data" focuses not only on the quantity of data but also on the diversity of the material being looked at. According to the findings of a study that was conducted by Russom (2011), only a

very small percentage of the general audience is familiar with concepts such as predictive analytics, advance analytics, and big data analytics. The findings of the investigation demonstrated that this to be the correct interpretation of the data. Relational database management systems (RDBMS), data warehousing, data mining, clustering, association, online analytical processing (OLAP), business process management (BPM), extraction, transformation, and loading (ETL), regression, classification, analysis, genetic algorithm, multivariate statistical analysis, and heuristic research are all examples of tools that can be used for big data analytics. Big data provides considerable benefits to decision-making in a number of ways, including the delivery of helpful information to customers, the enhancement of the capabilities of corporate analytics, and the improvement of the performance of specialist analytical application software. Making judgements based on analytics carried out on vast volumes of data poses relatively few problems, despite the numerous benefits that may be acquired from utilising this technique. Despite these benefits, adopting this method can be highly beneficial. The incapacity of staff to manage complicated analytics that are necessary for decision making, a lack of help from the organisation, and difficulties that frequently develop with database software are examples of the kinds of obstacles that typically come under this category.[31,32,33]

- Classification of Analytics

An investigation into the functions that analytics are put to reveals that there are three primary types of analysis: descriptive, predictive, and prescriptive. These are the basic categories that can be inferred from this investigation. Users are aided in their comprehension of what has occurred by descriptive analytics, which provides an explanation of a phenomenon based on historical data. This is accomplished through the use of reports and dashboards. With the use of predictive analytics, we are able to have a better understanding of the probable consequences. It enables predictions to be formed by using patterns, correlations between variables, and past data as the basis for the analysis. Prescriptive analytics is another useful tool that contributes to the process of executive decision making. It is beneficial to have a grasp of the

multiple outcomes that might take place under a variety of conditions. It is composed of several tools, such as optimisation, simulations, and what-if analysis scenarios utilising various sets of input parameters, among others.[34] Managers are able to make choices with an appropriate comprehension of the expected effects, and they are also able to plan in advance for any potential unforeseen complications. The context in which the data was collected has a considerable bearing on the kind of analyses that may be performed on the data. Text analytics, audio/video analytics, web analytics, and network analytics are the four subcategories that may be further split into analytics based on the type of data that is obtained. Another subcategory that can be further subdivided into analytics is network analytics. In the next paragraph, we will delve even further into the aforementioned subjects.

- Text Analytics

Document representation, enterprise search systems, search engines, user models, the relevancy of feedback, query processing', and the billions of customer searches for a particular product on Google as well as searches on the Amazon website are all indicators of the consumer's willingness to purchase the product. Utilized by companies such as Amazon, Jet Airways, and a variety of other e-commerce enterprises, amongst others, this function to propose items or flights to customers when they anticipate those customers would browse their websites again in the future, so increasing the likelihood that those customers will make a purchase.[35]

- Audio and Video Analytics

It just takes a few seconds for audio to be processed by technology thanks to audio analytics, which is primarily used for safety purposes in any organisation and can monitor a broad variety of sounds in the surroundings. Video analytics is utilised in the processing and analysis of videos coming from a wide variety of companies and areas. This assists in separating out occurrences that are useful for making judgements on operational matters.[36,37]

- Web Analytics

In order to generate insight from large amounts of data, such as click streams, web searches, purchase

histories, and online sales, among other things, the online retailer Amazon utilises data mining techniques. This information is utilised to make judgements on product promotions, and businesses like Amazon are finding that doing so has been quite effective for them. A link is found between the history of prior purchases and the possibility of making a new purchase based on previous purchases that are analogous to those made in the past. Through the use of this correlation, potential clients may be identified, After then, other products can be marketed to these clients through the use of various forms of digital media, such as emails, Facebook, or flashing messages on Amazon.com. [38]

- Network Analytics

Analytics of a network can offer information on the devices that are connected to the network as well as how those devices are communicating with one another. This information is helpful in developing network rules, as well as making decisions that are actionable and contribute to the enhancement of company performance while simultaneously lowering expenses.[39,40]

- Technology for Big Data Analytics

There is a growing need for quick information and data analysis as a result of the increased levels of commercial rivalry. According to Schlafke et al. (2012), rapid data analysis leads to improved levels of comprehension, which in turn results in improved levels of decision making. The application of analytics to forecast the severity of disease and infection risks is receiving a boost from technological advances. According to Shein (2012), using big data as a decision-making tool in the medical area may be a very helpful resource. The hospital compiles the information obtained from the electronic monitoring equipment used on the preterm infants. There is an overwhelming quantity of data that cannot be comprehended by human beings alone. Therefore, the significance of technology may be deduced from this. A person's length of time spent in the hospital can be cut significantly by using structured data to search for patterns that can foretell the beginning of illnesses. The ability of new algorithms to associate a patient's behaviour change to an illness is one of its many benefits.[41]

- ROLE OF BIG DATA IN DECISION MAKING

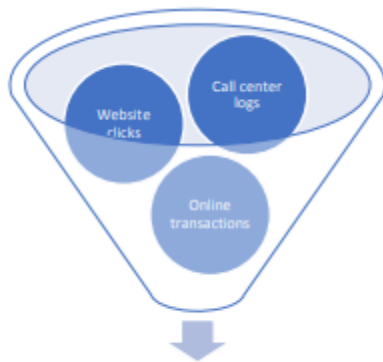
Business executives in this day and age are faced with a lot of issues, some of which include increased pressure from customers with high expectations, strong competition, rising costs of labour and materials, and decreasing product lifespans. As a result of globalisation, the divisions that formerly existed between nations are becoming less obvious. The ability to access the market is not yet hindered by considerations such as a place's geographical position or its physical distance from the market. Because of the unpredictability of the current environment, businesses need to be on the lookout for both threats and opportunities at all times, and they must be ready to make snap decisions based on the knowledge they currently possess. When it comes to the decision-making process for a company, we will discuss the significance of both traditional "small data" and "big data" in this section of the article.[42,43]

- Traditional decision support systems

According to Davenport and Dyché (2013), conventional decision support systems give companies the ability to make decisions about their internal operations based on the information provided by transaction processing systems such as enterprise resource planning (ERP) systems. As a consequence of future development, equivalent computer programmes were implemented on both the supply side (SRM) and the demand side (CRM), respectively. These systems, such as Ariba and Siebel, were beneficial in connecting the internal operations of the firm with the company's business partners, such as the company's customers and suppliers. This integration helped the company run more efficiently. The data for all of these systems was stored in relational databases, which were characterised by high levels of definition and organisation. These decision support systems were used to make internal operational and strategic decisions (such as how to price the items for maximising sales, status enquiry of orders, inventory planning, cost analysis, overdue balance payments according to their due dates, etc.). For example, how to price the products for optimising sales. This information contributed to more accurate and quicker judgements being made internally. Data warehousing and data mining processes need inputs from

traditional data sources. These traditional data sources offered such inputs. The overall design consisted of a main transaction database, a data warehouse that stored data that had been extracted, and classification software that divided the extracted data into several smaller databases. The data mined from these databases may be used by other technologies to give business information. According to Han et al. (2011), "data mining" is the process of extracting useful information from large amounts of gathered data by analysing it to find patterns, correlations, or connection rules.[44,45]

Figure 2 illustrates how top financial organisations such as Wells Fargo, Bank of America, and Discover are utilising big data to improve their understanding of the relationships they have with their customers. As can be seen in the image, this information originates from a variety of different places. They build an all-encompassing picture of the customer's journey by utilising a mix of data that is organised, semi-structured, and unstructured in various ways. This information comes from a variety of logs, including those kept by contact centres, websites, transaction records, automated teller machine transactions, clickstreams, and other sources. They are able to better identify the variables that lead to the loss of consumers by using this profile, which correlates customer journeys with the opportunities and problems faced by customers.



Profile of Customer Journeys
Figure2Customerjourney

- Competitive Intelligence

Using social networking sites (SNSs), researchers have carried out a number of studies to better comprehend the feelings, attitudes, and perspectives of consumers. Business leaders not only need to be

aware of how customers feel about their own products, but they also need to be aware of how customers feel about the products of their competitors. Using this knowledge, one may either plan improvements for future items or build a strategy to promote existing products. Both of these things will be helpful. The mining of data from social media platforms may provide a comparative examination of sales performance as well as the opinions of customers towards a company and its rivals.[46] In a similar vein, the trends analysis that Google offers is an excellent technique for comparing product searches of two or more rival products. These analytics give insights into the ways in which various items, services, or people are searched for via the internet in a variety of different geographical locations. This can give useful knowledge regarding product awareness as well as the creation of future marketing campaigns or the introduction of new products. There are websites like sentiment140.com that offer a peek of the possible ways that this intelligence might be tapped into.

- Cost and Time Reduction

The use of big data opens up a wide variety of doors for cutting down on expenses and saving time. In comparison to conventional database systems, big data technologies such as Hadoop clusters are quickly becoming a significantly more cost-effective alternative. It is possible for it to play a part in making judgements in real time about the promotion of offers and services to clients depending on the areas they are now in. The company collects and analyses data from telematics sensors that have been put on its 46,000 cars, and then uses this massive information to reconfigure the routes that its vehicles take. This helps the company save millions of dollars in fuel costs.

- Optimization and Simulations of Supply Chains

The number of business partners and suppliers in supply chains is growing at an alarming rate, which is increasing the complexity of supply networks. Over the course of the previous two decades, participants in the supply chain have implemented enterprise systems that record each and every transaction. Information is shared across various business partners, including customers and suppliers, as a result of developments in EAI technology.

Technology plays a significant role in ensuring the smooth and rapid transportation of commodities throughout supply networks.[47] When inventory is moved, many different types of scanning devices, including sensors and RFID, as well as location tracking devices like GPS and video recordings, generate a large amount of data. The usage of supply chain analytics, which gives an integrated view of the data contained within the supply chain, increases the capability of decision makers. This allows decision makers to make better decisions. We are able to do analytics and create information by first extracting, processing, and analysing data from data sources contained inside a supply chain system. Dashboards, analysis of patterns and trends, drill-down views, forecasts, knowledge bases, scenario and what-if analyses, simulations, and the ability to optimise processes are just some of the advanced capabilities that are made accessible by supply chain analytics. These things improve one's ability to make decisions and provide interpretations of circumstances, both of which are extremely important for businesses operating in highly competitive contexts.

- Predicting the Outcomes of Future Events

There are many different ways in which datasets may be used to make accurate predictions about the future. The following is a list of the types of analytics frameworks that may be constructed to analyse various datasets and generate predictions:

- Using previous transactional data and forecasting models such as regression, a company may anticipate future sales of its product or service by looking into the company's financial future.
- Using the correlations that were discovered in the previous purchases, determine which goods were bought jointly by consumers. Predict which goods a consumer is most likely to buy and provide suggestions based on their online shopping behaviour by referring to these correlations and the client's previous purchase history. (Artun & Levin, 2015)



Figure3A conceptual framework for analysing large amounts of data and making decisions [48]

Conduct research on previously collected data, examine the patterns of customer churn uncovered by looking at the historical data, and determine which variables play a role in customer churn. Find out which of your customers are most likely to terminate their subscriptions, and then take the necessary precautions to ensure that you can continue to serve them. The field of predictive analytics has a wide variety of further applications, some of which include identifying which customers are most likely to buy particular products based on the products they have previously purchased. There are also a great number of other applications. In addition to this, outbreaks of illnesses in certain geographic areas may be forecasted based on Google search results.[49]

- Real-time Decision Making

Many forward-thinking companies have developed the capability to make decisions in real time by utilising data from both the supply and demand sides of the market. They have the ability to make decisions online in real time owing to analytics, which is something that traditional company models are unable to compete with. Competitors cannot replicate these characteristics in their own products. Companies providing transportation services, such as Uber, utilise large amounts of data to plan the real-time routing of autos. This helps to cut down on the length of time that consumers have to wait in queue for their rides, which in turn enhances the entire experience for those patrons. Both Ola and Uber provide both clients and drivers with real-time information about their whereabouts through the use of Google Maps. They are able to receive a continual stream of high volume information about the demand for cabs and the availability of cabs in a range of geographic locations. They develop strategies for managing demand by basing those strategies on the facts that pertain to the demand in the present moment. Beeline is a relatively new demand-driven, shared private transport idea that was recently established by the city of Singapore. Beeline is supported by data analytics and mobile technologies. This system identifies prospective travel routes based on data on transportation and crowd-sourced travel patterns. Additionally, it dynamically assigns buses to travel routes in accordance with demand patterns. Commuters' journey times are cut down as a result, and more people will use services that provide shared

transport.[50]

CONCLUSION

We have come a long way since the digital revolution revolutionised the methods in which commercial organisations run their operations. Since then, we have seen many changes. Because of big data, firms now have the opportunity to acquire a competitive edge by utilising a range of different methods to analytics. Insights, patterns, connections, and linkages that were previously inexplicable to us using the traditional way of examining small data sets may now be understood with the help of these methodologies. These make the process of decision-making for corporate leaders better by utilising data from social media platforms, competitive intelligence, techniques for reducing costs and saving time, supply chain analytics, web analytics, and a variety of other types of data. In recent years, considerable incentives have been given to organisations who have realised the significance of big data and built solutions that are based on data. These businesses have been at the forefront of receiving these awards. Numerous companies have realised the benefits of making decisions based on analytics and have begun to implement analytics into nearly every facet of their business operations. In this paper, we propose a conceptual framework for establishing analytics skills and discuss how new knowledge might assist small and medium enterprises in competing with less resources. Additionally, we discuss how this conceptual framework can be used to help create analytics capabilities. Such businesses are able to adopt it with some modifications to bring it in line with their company domain and model. This framework can serve as a jumping off point for additional analysis, improvements, and potential future research endeavours.

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