

# Literature Review Paper on Big Data Technology in Retail Industry

Ms. Kavita T. Rangari <sup>#1</sup>, Dr. Abhijeet Kaiwade <sup>\*2</sup>

*#Asst. Professor, BBA(CA) Department  
Sinhgad College of Commerce, Kondhwa, Pune  
#kavita.rangari13@gmail.com*

*\*Professor & Research Coordinator  
MCA Department D Y Patil Institute of MCA and Management, Akurdi, Pune  
\*kaiwade@gmail.com*

**Abstract :** Big information could be a information whose scale, differences, and complexity require modern engineering, procedures, calculations, and analytics to oversee it and extricate esteem and covered up information from it. In arrange to handle these huge data in an effective way. The term 'Big Data' portrays inventive strategies and innovations to capture, store, disperse, oversee and analyze petabyte- or larger-sized datasets with high-velocity and diverse structures. Big Data is the center stage for organizing Huge Information, and understands the issue of making it valuable for analytics purposes. Huge information can be organized, unstructured or semi-structured, coming about in lack of ability of routine information administration strategies. Information is created from different diverse sources and can arrive within the framework at different rates.

This paper hereby, a broad overview about existing research is presented to facilitate a more detailed exploration and to foster the evolution of the Retail Industry. We conduct a systematic review of big data literature to analyze which requirements for the retail industry discipline are proposed. This paper aims to analyze some of the different analytics methods and tools which can be applied to big data, as well as the opportunities provided by the application of big data analytics in various decision domains.

**Keywords:** *big data, analytics, dataset, unstructured, semi-structured, decision domains.*

## INTRODUCTION :

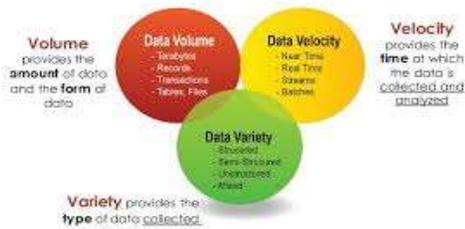
The interest of big data information has increased because of the significant amount of data generated every 24-hour interval. Information is getting bigger because it is continuing to be generated from more devices and more sources such as personal computing device, mobile telephone

set, government criminal record, health care disk, social media, street sensor, climate detector, airport terminals, hypermarkets' points of sales, etc. These sources generate a massive amount of data and it will continue to generate more and more data as time passes since people are getting more dependent on technology. Data can be classified into structured and unstructured data. Structured data refers to data that can be organized and stored in relational databases so it can be easily used and searched efficiently. Unstructured data refers to data, which does not have a pre-defined data example, or it is not organized in a per-defined style such as picture, images, emails, text file and blogs. Searching and analyzing of unstructured data is more difficult than for structured data.

## WHAT IS BIG DATA :

Big data is not new concept. In 1990s data warehouses were used to store large amounts of data. That time a terabyte was big data. But Today, eBay captures a terabyte of data per minute and maintains over 40 petabytes. So what is big data? One perspective is that big data is more and different kinds of data than is easily handled by traditional relational database management systems (RDBMSs). Some people consider 10 terabytes to be big data, but any numerical definition is likely to change over time as organizations collect, store, and analyze more data.

The characterize big data as having high volume, high velocity, and high variety—the three Vs



Volume - the amount or quantity of data

Velocity - the rate at which data is created

Variety - the different types of data

Fig: 1.1 : 3Vs of Big Data

Fig 1.2 shows the architecture of Big Data Technology. It consist of logical components that fit into a big data architecture. Big data architectures include some or all of the following components:

- Data sources.
- Data storage.
- Batch processing.
- Real-time message ingestion.
- Stream processing.
- Analytical data store.
- Analysis and reporting.
- Orchestration.

#### BIG DATA IN RETAIL INDUSTRY :

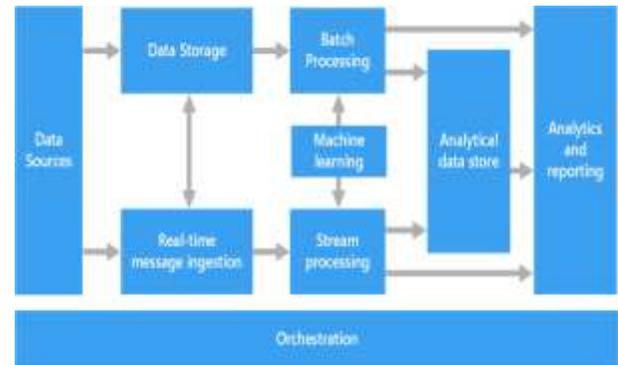
“Big Data and Predictive Analysis is Key to Superior Supply Chain Performance: A South African Experience”, Surajit Bag,(2017)

The researcher uses partial least square regression analysis to study the relationship among buyer-supplier relationship, big data and predictive analysis. There is a positive relationship between big data, predictive analysis. There is a positive relationship between and big data, predictive analysis and buyer-supplier relationship. The study is a unique contribution to the current literature by shedding light on the practical problems persisting in the South African context.

“The Role of Big Data and Predictive Analytics in Retailing”, Eric T. Bradlow, Manish Gangwar, Praveen Kopalle, Sudhir Voleti,(2017)

The researcher studied the opportunities in and possibilities arising from Big Data in retailing. They talk about five major data dimensions as data pertaining to customers, products, time, location and channel. The importance of theory in guiding any systematic search for response to retailing motion , as well as for streamlining analysis remains undiminished, even as the role of Big data and predictive analytics in retailing is hardening to rise in importance, aided by newer germ of data and large-scale correlational

proficiency . The Statistical publication discussed include a particular centering on the relevance and uses of Bayesian analysis techniques, predictive analytics using big data and a



field experiment, all in a retailing linguistic context . Finally, the ethical and concealment issues that may arise from the use of big data in retailing are also highlighted by the researcher.

“An Exploration of Big Data Practices in Retail Sector”,Emel Aktas, Yuwei Meng, (2017)

The researcher identified big data lotion for the retail sector. Decisions around handiness , assortment, pricing, and layout planning are identified as Florida Francis Scott Key retail cognitive operation . This key points can welfare from more advanced data processing and analysis. The researcher propose a comprehensive definition that can be accessed and processed in a timely fashion to improve operations and processes. Existing applications of big data in retail operations concern sophisticated analyses and access to high volumes of data in a short of time.

“Retail Analytics: Driving Success in Retail Industry with Business Analytics”, Sudeep B. Chandramana,(2017)

According to investigator , Retailer can welfare immensely form a structured analytics-driveway approach which will help to understand how their customers are not only using their intersection but also services. How their trading operations ,supply chain of mountains are performing and how to identify key risks - perceptiveness that they can then human activity upon. The collected data, gives the retailers immediate insights on the shop class trends. This analysis on the move allows them to adjust their prices and add to the lure by announcing on the berth discounts on the sales floor based on their current and previous shopping patterns. Data capture and analytics usage certainly have come a long way in the last decade years, and it is interesting to look spinal column on how trends in data analytics have affected the marketplace. As the Cyberspace of Things expands further

and our human race becomes even more connected, this space will continue to evolve.

“Predictive Analysis of Big Data in Retail Industry”, Hamza Belarbi, Hamid Bennis, (2016)

The researcher aim was to find out how can big data analytics help to improve the retail business. However, there are some barriers to using big data analytics such as the privacy of information and scalability of analytic algorithmic rule . Retail merchant can use analytic technique and technologies to analyze big data in decree to help with supporting decision making.

“Enterprise Big Data: Case Study of Issues and Challenges for Businesses in Finance and Retail Sectors”, Ehiwe Dunsen Dominic, Akinola Kayode E., Ominike Akpovi A.(2016)

The researcher studied the concept of Big Data and the impact on enterprise organizational performances. The results from the analysis suggest that growing data set impacts over 80% of surveyed businesses. Also, it was found that the relationship and impact on businesses are similar across geographical locations. The research provided recommendations on what future efforts in this regard can focus on.

“Big Data Capabilities and Readiness of South African Retail Organizations”, Joan Mneney, Jean-Paul Van Belle,(2016)

The researcher used a qualitative feeler to understand the current capabilities and readiness of Big data in Due south African retail organizations. Two theoretical models; Engineering science Organization Environment (Toe ) together with Task Technology Fit (TTF) were used to understand the factors that enable acceptance and implementation of Big data in retail organizations. Semi structured interviews were conducted with individuals from retail organizations, Big data vendors and IT professional service providers to get an understanding of the current status of Big Data in the S African context. The bailiwick reveals that South African retail organizations are capable and ready to adopt and implement Big Data, however, more efforts need to be placed from the organizational perspective and Big Data technology vendors need to provide more financial support to enable realization of more benefits of Big Data in South African retail organizations.

“Retail Big Data Analytics”,White Paper, eMpulse,(2016)

To stay competitive, retailer s need to enhance product offerings, service story and monetary value models in real time. But most retailers battle to efficiently manage this

changing concern environment because of the lack of use of data they already have on their customer . The research is carefully designed to response the business questions that matter the most to the last customer . The researcher discuss the technical challenge and also offered the data analytics solution for that. Data base analytics conducted by eMpulse include Data mining, Data modelling , Customer division , Prison term series analysis, Customer Lifetime Time Value analysis, Other advanced data analytics.

“The Big Possibilities for Big Data in the Retail Industry”, Mark Waldron,(2016)

According to researcher by applying big data analytics to the retail industry, how businesses can look to find new, innovative ways to collect large amounts of data and apply to improve their processes. It also gives new ways of creating value for customers. By focusing on mobile scanning is just ne potential way that new data can be collected and applied in real time in retail.

“Conceptual Model for Successful Implementation of Big Data in Organizations”, by Mohanad Halaweh, Ahmed El Massry (2015)

The researchers aims to develop a holistic model that includes the factors that would affect the success or failure of the implementation of big data in organizations. This research also examines the opportunities that organizations would attain from implementing big data, as well as the challenges that could hinder this implementation. The proposed model provides IT managers and decision makers the important factors that they need to consider when deciding to implement big data in order to ensure that it achieves the competitive advantage. This research has conceptually developed the model of success factor and the model is very generic

“The use of big data analytics in the retail industries in South Africa”,Matthew Ridge, Kevin Allan Johnston and Brian O'Donovan, (2015)

The researcher aim was to assess the use of big data analytics in the retail manufacture in South Africa. The welfare of using big data analytics are not specific to a particular manufacture . Retail merchant , for example, can use big data analytics to gain new insights about their customer in order to inform determination making around pricing and marketing. The usage of big data analytics was assessed by collecting data from interviews with retailer , big data vendors and professional divine service . The briny determination of the study was that South African retailers are not using big data analytics. Some retailers are, however, using big data analytic

program to improve the speed of processing large amounts of structured data and to deliver information cost effectively. The findings show that South African retailers find it difficult to identify a use case to justify the investing required for using big data analytics.

“Harnessing the power of Big Data Big Opportunity for Retailers to win customers”, Srinivasan N, Rajeev Nayar, (2015)

The researcher describes about the current state of the retail industry and discuss how big data becoming the solution for retail merchant, can adopt to maximize revenue. It explores the samara pillars of Big Data along with transformative opportunity and an acceptance roadmap for retailers. Big Data solution are the new frontier for retailer seeking to crusade concern transformative value and accrue higher margin and profits from their marketing strategies and supplying strand of mountains planning. Big data helps retailer purchase large and high speed sets through intelligent analytics to uncover customer trends and track customer behavior in store and online, in a toll effective manner. Retailer need to bosom the exponent of Big Data and implement solution using a comprehensive strategy such a strategy requires a robust adoption roadmap that defines scope, application and predicted benefit of a Big Data enablement. Some retailers are ahead of the curve and are drive business vitrine for Big Data with its proven results of enhancing productivity, streamlining supply chain efficiencies and increasing product sales, customer micro segmentation, assortment and predictive demands forecast, Big Data solution provide tremendous opportunity to help retailer win.

“Improving Retail Performance with Big Data- Oracle Enterprise Architecture White Paper”,| (2015)

This paper provides an overview for the adoption of Big Data and analytic capabilities as part of a “next-generation” computer architecture that can meet the needs in the moral force retail market. The ability to access, analyze, and manage vast volume of information while rapidly evolving the Information Computer architecture is increasingly critical to retail merchant looking to improve business efficiency and performance. Retailer have long gathered client data tied to loyalty bill of fare, the legal age of which appearance what client s previously purchased. The data illustrate past times purchasing convention, but might not be indicative of future demand. Utilizing additional data generator can help retailers gain a better understand of future customer demand, as well as gain a better view of the customer and customer family / network purchasing patterns. These data sources can include Social Media, Web browsing patterns, Traditional enterprise

data from operational systems, Data from data aggregators (Nielsen, IRI, etc.), Advertising response data, Demographic data, Weather prediction and monitoring systems. Business analysts want more data to be ingested at higher rates, stored longer and want to analyze it faster. “Big Data” resolution help to enable retailers to meet these requirements.

“Big Data Mining: Challenges and Opportunities to Forecast Future Scenario”, Poonam G. Sawant, Dr. B.L.Desai, (2015)

According to researcher Big data is the good opportunities for business. Using traditional databases people were storing and processing data. Big data gives opportunities to business executives to make effective business decisions and improve quality of products, services and business models. So there is a need to follow trend in big data carefully to make the proper decisions in the business.

“Beyond Big Data: How Next-Generation Shopper Analytics and the Internet of Everything Transform the Retail Business”, White Paper, Kathryn Howe, (2014)

Few industriousness are changing more rapidly than today’s retail sector. A still-turbulent economy, new selling channels, advanced digital engineering science, and increasingly demanding consumer all challenge retailers to find new manner of remain ing relevant and competitive. The purchasing determination journey for consumers involves multiple steps, many of which are now being captured, digitized, and transformed into prosody and data. As this data becomes an implied derivative of essential retail and consumer engineering science, the direction is shifting from how to acquire the data to how to extract insights from it—insights that can be turned into distinction and competitive vantage for the retailer and a better shopper experience for the consumer. But the main challenge of big data is just that—it’s big. Massive amount of money of structured and unstructured information are spile up in retailer and supplier data warehouses. Customer metrics derived from video and other sensors, social media, call centers, and mobile devices have the power to provide unprecedented insight into the purchase decision process.

“Big Data Analysis for Retail Industry and Data Mining Techniques”, P.Manikandan, S.Yuvarani, Dr.C.Jothi Venkateswaran, (2014)

The retail industry provides an exciting way of human being life story for their livelihood in this sector of the American-Indian language saving. Retailers provide the goodness and services from food, auto parts, wearing apparel, home furnishings, appliances, and electronics to advice, home

advance , and skilled labor. The Big data collected from Supermarkets, Super centers, Hard-line of business computer memory , Price reduction stores etc... The data mining techniques are used wherever large volumes of big data need to be processed for determination support Retail industry.

“Getting real about Big Data: applying critical realism to analyse Big Data hype”,Stephen Fox,Tuan Do, (2013)

An emerging application of Big Data is the addition of sensors and other micro-electronic twist to engineer-to-order (ETO) goods such as one-of-a-variety edifice and ship . The addition of micro-electronic devices can enable the setting up and operation of smart construction and smart ship . The purpose of this paper is to provide a critical realist analysis of Big Data hype. This is necessary to determine what challenge will need to be met before project businesses can achieve informational effects and transformational effects from Big Data engineering science.

“BIG Data Analytics: A Framework for Unstructured Data Analysis”,T.K.Das , P.Mohan Kumar,(2013)

The news composition is to uncovering an efficient way of storing unstructured information and appropriate approaching of fetching information . Unstructured data targeted in this work to organize, is the world tweet of Twitter. Building an Big Information application that gets stream of public tweets from twitter which is latter computer storage d in the HBase using Hadoop cluster and followed by data analysis for data retrieved from HBase by Remainder calls is the pragmatic approach of this project. The researcher presented a model for analyzing unstructured data. . This is a ongoing project. They have completed the first form where unstructured data is pulled from public tweets of Twitter and the XML data is parsed to store in a NOSQL database like HBASE.

#### CONCLUDING REMARK:

The paper describes what is Big Data along with 3 Vs, Volume, Velocity and variety of Big Data. The paper also focuses on Big Data architecture with component as Data sources,Data storage. ,Batch processing ,Real-time message ingestion ,Stream processing ,Analytical data store ,Analysis and reporting ,Orchestration. While reviewing the literature researcher had identified as we have entered in era of Big Data the retailer should study the opportunities and challenges of big data technology. The technical challenges must be understood, that how structure and unstructured data is to be handle and process with the help of Big Data.

Accordingly, the literature was reviewed in order to provide an analysis of the big data analytics concepts which are being researched, as well as their importance to decision making. Big data storage and management, as well as big data analytics processing were detailed.

By applying analytics to big data, valuable information can be extracted and exploited to enhance decision making and support informed decisions. Some of the different areas where big data analytics can support and aid in decision making are customer intelligence, fraud detection, and supply chain management. its benefits can serve different sectors and industries, like healthcare, telecom, manufacturing, etc. We believe that big data analytics is of great significance in this era of data overflow, and can provide unforeseen insights and benefits to decision makers. If properly exploited and applied, big data analytics has the potential to provide a basis for advancements, on the scientific, technological, and humanitarian levels.

#### REFERENCES

- [1] “Big Data and Predictive Analysis is Key to Superior Supply Chain Performance: A South african Experience”, Surajit Bag, *International Journal of Information Systems and Supply Chain Management*, Volume 10 • Issue 2 • April-June 2017
- [2] “The Role of Big Data and Predictive Analytics in Retailing”, Eric T. Bradlow, Manish Gangwar, Praveen Koppalle, Sudhir Voleti, (2017)
- [3] “An Exploration of Big Data Practices in Retail Sector”, Emel Aktas, Yuwei Meng, 2017
- [4] “Retail Analytics: Driving Success in Retail Industry with Business Analytics”, Sudeep B. Chandramana, *RJSSM*, Volume:7, Number:4, August 2017
- [5] “Predictive Analysis of Big Data in Retail Industry”, Hamza Belarbi, Hamid Bennis, ISSN: 2509-2014, 2016
- [6] “Enterprise Big Data: Case Study of Issues and Challenges for Businesses in Finance and Retail Sectors”, Ehiwe Dunsen Dominic, Akinola Kayode E., Ominike Akpovi A., *International Journal of Applied Information Systems (IJ AIS) – ISSN : 2249-0868 Volume 11 – No. 4, September 2016*
- [7] “Big Data Capabilities and Readiness of South African Retail Organizations”, Joan Mnene, Jean-Paul Van Belle, *IEEE*, 978-1-4673-8203-8, 2016
- [8] “Conceptual Model for Successful Implementation of Big Data in Organizations”, by Mohanad Halaweh, Ahmed El Massry (2015)
- [9] “Big Data Mining: Challenges and Opportunities to Forecast Future Scenario”, by Poonam G. Sawant, Dr. B.L.Desai, *International Journal of Innovative Research in Computer and Communication Engineering*, Vol. 3, Issue 6, June 2015
- [10] “The use of big data analytics in the retail industries in South Africa”, Matthew Ridge, Kevin Allan Johnston and Brian O'Donovan, (2015)
- [11] “Big Data Analysis for Retail Industry and Data Mining Techniques”, P.Manikandan, S.Yuvarani, Dr.C.Jothi Venkateswaran, *IJESM* Volume 3, Issue 4 ISSN: 2320-0294, 2014
- [12] “BIG Data Analytics: A Framework for Unstructured Data Analysis”, T.K.Das , P.Mohan Kumar, (*IJET*), ISSN : 0975-4024 Vol 5 No 1 Feb-Mar 2013