

**AN ANALYTICAL STUDY OF ORGANIZATION MANAGEMENT BY EVALUATING  
EFFECTIVENESS OF DATA ANALYTICS (DA) IN CONTRACT LOGISTICS SERVICES OF  
THIRD PARTY LOGISTICS (3PL) COMPANIES IN MAHARASHTRA:  
A LITERATURE REVIEW**

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**Abstract**

*A research entitled “An Analytical Study of Organization Management by Evaluating Effectiveness of DATA ANALYTICS (DA) in Contract Logistics Services of Third Party Logistics (3PL) Companies in Maharashtra” was undertaken to analyze the impact of DA on key O & M areas of the 3PL companies. The objectives of the study included assessment of the impact of DA on planning of 3PL companies, evaluating the effect of DA on operations of 3PL companies, ascertaining the impact of DA on cost management of 3PL companies, finding out the effect of DA on control of 3PL companies, evaluating the impact of DA on customer experience of 3PL companies, assessing the collective impact of DA on organizational performance of 3PL companies, and finding out the major challenges impeding use of DA in 3PL companies. A literature review was undertaken as a part of the study. This paper presents select reviews from the study.*

**Keywords:** *Data analytics; 3PL Companies; Organizational Performance; Literature Review*

**I. Introduction**

A research entitled “An Analytical Study of Organization Management by Evaluating Effectiveness of DATA ANALYTICS (DA) in Contract Logistics Services of Third Party Logistics (3PL) Companies in Maharashtra” was undertaken to analyze the effectiveness of various O & M activities due to the impact of DA. The objectives of the study were:

- i) To assess the impact of DA on planning of 3PL companies,
- ii) To evaluate the effect of DA on operations of 3PL companies,
- iii) To ascertain the impact of DA on cost management of 3PL companies,
- iv) To find out the effect of DA on control of 3PL companies,
- v) To evaluate the impact of DA on customer experience of 3PL companies,
- vi) To assess the collective impact of DA on organizational performance of 3PL companies, and
- vii) To find out the major challenges impeding use of DA in 3PL companies.

A pilot study took place before the main study began. It aimed to identify issues in data collection. It tested the questionnaire usage and the hypotheses from the methodology. It also checked the validity and reliability of the primary data questionnaire. This paper presents the pilot study results.

**II. Literature Review**

1. Tiwari et al. (2018) study big data analytics research in supply chain management from 2010 to 2016. They offer findings to industries. The volume of data from full supply chain

practices has grown fast in recent years. Supply chain professionals now struggle to handle this huge amount of data in a competitive environment. They review new techniques to track how firms create, capture, organize, and study data. This analysis gives valuable information to industries. Big data analytics is a top technique that helps them solve this problem. The authors saw the benefits of big data analytics in the supply chain. This motivated them to review the impact and application of these analytics in supply chain management. First, they discuss big data analytics on its own. Then they look at its role in the supply chain. The paper explores current research and applications. Finally, the authors list findings for industries. The observations in this paper guide scholars and practitioners who want to use big data analytics in different parts of supply chain management.

2. Nguyen et al. (2018) note that interest in big data analytics for supply chain management has grown fast among academics and practitioners. This interest created a need to review research development and set a new agenda. The authors respond to this call with a new classification framework. This framework gives a full picture of where and how the field applies big data analytics within the supply chain context. The structure relies on the content analysis method from Mayring (2008). It addresses four questions. First, in what areas is the technology applied? Second, at what level do these areas use analytics? Third, what model types does the field use? Fourth, what techniques build these models? The discussion of these questions

- reveals research gaps and leads to future directions.
3. Wang et al. (2016) write that the amount of data produced and sent over the internet grows fast. This trend creates challenges for organizations that want to gain value from analyzing this large flow of big data. Big data offers unique details about market trends, buying patterns, and maintenance cycles. It also helps lower costs and enables specific business decisions. The authors see the value of big data business analytics. They review literature on its use in logistics and supply chain management. They define this intersection as supply chain analytics. The classification relies on the nature of the analytics and the focus of the logistics function. The analytics types are descriptive, predictive, and prescriptive. The focus covers strategy and operations. The authors propose a maturity framework to measure how well a firm applies these analytics. This framework has four capability levels: functional, process-based, collaborative, and agile or sustainable. The paper highlights the role of analytics in logistics. It notes the methods used to collect, share, and study information driven by big data. Managers must view these analytics as strategic assets and combine them across business activities. This creates integrated enterprise business analytics. Finally, the authors list the limits of the study and directions for future research.
  4. Maheshwari et al. (2021) claim that most research and business revolves around data. This is a widely accepted fact. Data from various business sectors grows sharply. Managing this massive amount of data is the biggest. Professionals face pressure today. Big Data Analytics (BDA) helps decision-makers manage large amounts of data. BDA plays a major role in Supply Chain Management (SCM), Logistics Management (LM), and Inventory Management (IM). It improves business operations by studying customer behavior. This paper presents a review from 2015 to 2019 based on the benefits of BDA. It shows the value of BDA in SCM, LM, and IM by examining 58 papers. The authors selected these from 260 papers in the Web of Science (WoS) database. The results offer current facts to scientists and business leaders. The text lists progress made and challenges remaining in these fields.
  5. Kache and Seuring (2017) notice a gap in supply chain management (SCM) research. Few studies look at Big Data Analytics and information use in a supply chain. This paper builds SCM theory. It checks the effects of Big Data Analytics on information use in business. Companies need current and accurate data. This study looks at the chances and problems that come with Big Data Analytics in SCM. Managers pay attention to Big Data Analytics. But real-world tests are rare. Few sources cover both topics. The authors use the Delphi research technique. The study shows the shift to digital business. It lists 43 opportunities and challenges for companies and supply chains. These points give researchers a first collection of ideas. This helps guide future work on Big Data Analytics and SCM. This research adds to what we know. No other study has assessed these factors specifically for Big Data Analytics.
  6. Govindan et al. (2018) study big data analytics in logistics and supply chain management. They check new methods and practices. The articles analyze ways to make big data analytics better for logistics and supply chains. Topics include tracking strategies using technology. They also look at how data affects financial results. The authors discuss problems with setting up these systems. They also check how well supply chains handle big data. This note sums up the traits of big data. It covers good practices for use. It also reviews methods for testing and setup.
  7. Oncioiu et al. (2019) state that big data analytics adds value. It offers a new view by making predictive analysis better. This research focuses on supply-chain management. It studies how big data analytics helps Romanian supply-chain companies. These firms check their experience and plans. They also review their skills in using big data analytics. The authors assess the tools needed to reach these goals. They also look at the results and performance gains. The quantitative study used a sampling survey. The research used a questionnaire as a data collection tool. It included closed questions measured with nominal and ordinal scales. A total of 205 managers provided complete and useful answers for this research. The collected data were analyzed with the SPSS package using frequency tables, contingency tables, and main component analysis. The major contributions show that companies are concerned with identifying new statistical methods and tools. Examples include cloud computing and security technologies. These technologies need rigorous exploration.
  8. Arunachalam et al. (2018) find that many organizations use Big Data Analytics (BDA) to improve performance in the big data era.

Previous literature on BDA put limited focus on the capabilities required to get value from big data. This paper performs a systematic review of BDA capabilities in supply chains. It also develops a maturity model. The paper presents a bibliometric and thematic analysis of research papers from 2008 to 2016. This work contributes by theorizing BDA capabilities in the supply chain context. It provides future research directions in this field.

9. Aryal et al. (2018) explain how the understanding of disruptive technology has changed over time. They focus on big data analytics and the Internet of Things (IoT). The study examines how research in supply chains differs from other fields when managing disruptive change. This study follows a four-step systematic review process. The steps are literature collection, descriptive analysis, category selection, and material evaluation. The authors used latent semantic analysis with Leximancer for the final stage. This tool allows for faster and more consistent content analysis. The empirical analysis identified key trends in big data analytics and IoT across two time periods. Research demonstrated steady growth by 2015. Rapid growth occurred afterward. The main finding is that recent interest in big data leans toward customer service and support. It also overlaps with supply chain networks, systems, and performance. Major research themes in IoT moved from general business information management. They shifted to specific contexts like supply chain design and models. The authors seek to identify important trends in disruptive technologies research. They also provide more awareness of this research approach.
10. Gunasekarn et al. (2016) state that technology revolutions generate data faster than ever. Data sets are also bigger. Three Vs characterize big data: volume, velocity, and variety. Data science principles show that analytics benefit from large data volumes. Statistical reliability increases as the population size increases. Predictive methods with more factors have better explanatory power than methods with fewer factors. Velocity refers to the rate of data generation. Online sales, smartphones, social networks, and sensory devices have increased the information flow. Variety refers to different data types. These include unstructured, semi-structured, and structured data. Big data contributes to predictive analytics in two ways. It provides high reliability and high explanatory power. The authors note that BDPA has the potential to change existing supply chains.
- BDPA can improve supply chain performance by improving visibility. The study identifies visibility as a key factor. This capability is key for better company results. It improves the power to recover and overall strength. Writers describe BDPA as a tool that saves money on supply chain tasks. It also helps the firm compete in the market.
11. Addo-Tenkorang and Helo (2016) state that big data is a major force for organizations of all sizes in this global era. This new enterprise system offers features to acquire, store, and analyze large amounts of data. The data comes from various sources to add value. Current research reveals limited agreement on the performance of “big data.” This paper investigates “big data” and its analysis in operations or supply-chain management. It also looks at trends and views in the field. The paper is a literature review. It discusses main issues and the extension into “big data II” or IoT. It proposes a value-adding framework. The authors used a comprehensive literature review. They reviewed over 100 peer-reviewed articles, conference proceedings, and industrial white papers. They used Harzing Publish or Perish software to analyze trends in “big data” applications between 2010 and 2015. Four main attributes define “big data.” These are development sources (Variety – V1), acquisition (Velocity – V2), storage (Volume – V3), and analysis (Veracity – V4). The study of “big data” has evolved through application in specific industries to create value (Value-adding – V5). This includes cloud computing and the Internet of Things. The four Vs expanded into five Vs. This paper presents original research on issues and trends in operations and supply-chain management. It proposes a “Big data II” framework. This framework extends “big data” with a value-adding view. It suggests exploring “big data” fully. This helps managers and executives make informed strategic decisions for better return-on-investment (ROI). It also gives organizations a stream of information to gain an edge over competitors.
12. Mishra et al. (2018) find that Big Data has shifted from an emerging topic to a growing research area. Classifying research types and examining general trends is now necessary. This identifies potential areas for future investigation. This paper reviews literature on ‘Big Data and supply chain management (SCM)’ starting from 2006. It provides insight into the field using bibliometric and network analyses. The authors evaluate 286 articles

published over 10 years. They identify top authors, countries, and research topics. They also compare influential works based on citations and PageRank. They propose six research clusters where scholars can expand Big Data research in SCM. The authors contribute to the literature by discussing current challenges. They also identify six research clusters and future directions. They offer managers different schools of thought. This helps them use Big Data and analytics for SCM in daily work.

13. Queiroz and Telles (2018) examine the state of big data analytics (BDA) in Brazilian firms. They look at different organizational and supply chain management (SCM) levels. The paper focuses on understanding BDA. This paper measures awareness in Brazilian firms. It suggests a framework to check firm maturity for implementing Big Data Analytics (BDA) in logistics and supply chain management (SCM). The authors surveyed SCM levels at 1,000 firms using questionnaires. They received 272 responses. Only 155 were valid. This equals a 15.5 per cent response rate. The results show what Brazilian firms know about BDA. The data also highlights barriers to adopting BDA projects. The study connects supply chain levels with BDA knowledge. The authors proposed a plan for BDA adoption in SCM. But the study lacks external validity. The sampling method prevents generalization, even within Brazil. Future research must improve understanding in this field. Scholars should study big data impacts on supply chains in emerging regions like Latin America. This paper helps practitioners manage big data and SCM activities. It offers guidance through the BDA-SCM triangle model. This tool aids the launch of BDA projects. This study is the first to examine BDA at different organizational levels in emerging countries. It provides practical tools for BDA-SCM projects.
14. Anitha and Patil (2018) connect data science with supply chain management. Firms analyze data for inventory, forecasting, and predictions. These outputs appear as reports or queries. But prices change and weather patterns shift. The economy is volatile. Business is complex. So forecasts are often wrong. This problem caused the growth of supply chain analytics. This field uses qualitative and quantitative methods to solve problems. It predicts outcomes based on data quality. Companies now adopt Big Data tools to improve work with customers, retailers, and governments. Big Data connects SCM areas. These include procurement, transport,

warehouses, marketing, and smart logistics. Supply networks are growing larger and harder to manage. Service demands are rising. The data requiring analysis is now more difficult to handle. This paper reviews Data Analytics adoption in a modern architecture. The authors build a linear regression model using sales data. They also survey Big Data techniques. These techniques cover storage, processing, management, and visualization of supply chain data.

15. Lai et al. (2018) study why firms adopt Big Data Analytics (BDA) in daily operations. They review past texts on BDA and supply chain (SC) management. The study groups factors into four types. These include technological, organizational, and environmental factors, plus SC characteristics. The authors rely on innovation diffusion theory. They built a model with direct technological and organizational factors. The model also included moderators. The team collected survey data from 210 organizations. They analyzed this data with SPSS and SmartPLS software. The results show that perceived benefits affect the intent to adopt BDA. Support from top managers also matters. External factors change the link between driving forces and adoption. These environmental factors include government policy, SC connectivity, and actions by competitors. Big data usage in logistics is still in the start-up stage. Interpretations of BDA vary. This causes confusion in the field. The text discusses the meaning and potential of Big Data (BD). We gathered data via questionnaires from IT managers. Their views might not reflect the whole organization. This paper tests if organizations intend to adopt Big Data Analytics (BDA). It adds to research on BD and supply chain (SC) management at the same time. Top managers can use this research to value BDA benefits. They can also learn to change business strategies as the environment and SC maturity shift. The study adds to the literature on BDA adoption. It connects the fields of BD and SC management.

### III. Research gap and questions

The research gap is on several counts. First and foremost, data analytics research, while is substantial in size in case of SCM and logistics, contextual setting of Indian business organizations, is rarely seen. Moreover, the extant literature is tilted towards more of SCM as an internal function of the organization, rather than a third-party logistic organization. 3PL organizations have their typical

structural and dimensional settings. Therefore, it would be of interest to analyze application of DA in such organizations and assess its impact on various organization and management functions and also the overall performance of the organization.

The central research problem of the research is to analytically study the application level of DA across key areas in 3PL organizations from Maharashtra. The research also evaluates the impact of the application of DA on critical business areas like planning, operations, cost management, control, and customer experience. Further, it measures the impact of DA on the overall performance of these organizations.

Hence this research was undertaken to address the following research questions:

RQ1 – What is the impact of DA on planning of 3PL companies?

RQ2 – What is the impact of DA on operations of 3PL companies?

RQ3 – What is the impact of DA on cost management of 3PL companies?

RQ4 – What is the impact of DA on control of 3PL companies?

RQ5 - What is the impact of DA on customer experience of 3PL companies?

RQ6 - What is the collective impact of DA on organizational performance of 3PL companies?

RQ7 - What are the challenges impeding use of DA in 3PL companies?

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